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APPENDIX A – Context

Century of Progress Architectural District

- A. HABS Large-Format Photographs
- B. HABS Written Historical and Descriptive Data

APPENDIX B – Historical Data

House of Tomorrow

- A. HABS Large-Format Photographs
- B. HABS Written Historical and Descriptive Data
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APPENDIX D – Exhibits

- A. *House of Tomorrow America's First Glass House*
- B. *Glass as an Architectural Medium*
- C. *Keck & Keck*
- D. Oral History Interview with Joel Miller
- E. Oral History Interview with Mary Miller-Luxon
- F. Existing Condition Photographs
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EXECUTIVE SUMMARY

Statement of Purpose

The purpose of this document is to document the evolution of the structure, assess existing conditions and features, evaluate alternative treatments, and recommend treatments responding to objectives identified by park management for the rehabilitation of the House of Tomorrow. The House of Tomorrow was constructed for the 1933 Century of Progress Exposition. This report will offer alternative treatments for key issues while proposing treatments that will preserve the structure for the use and enjoyment of future generations.

Project Team Members

Information and Management Assistance:
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Investigative History and Methodology

The first investigation of the House of Tomorrow is believed to have been done for the General Management Plan (GMP) of Indiana Dunes National Lakeshore which was completed in 1980. The GMP addressed each of the Century of Progress houses separately, and stated that, "The

house was intended to be the inspiration for new and innovative architecture. Of all the World's Fair houses, this one employs the most radical use of space and materials."¹ The national lakeshore chose, at that time, to relocate the house outside the active beach zone to a site located along Broadway Drive in Beverly Shores. The plans, as stated in the GMP, also included restoring the house to its 1933-34 appearance, and acquiring the original furnishings for interpretive purposes, however, funding for this project was not obtained.

In 1985, the Midwest Regional Office completed research on the Century of Progress houses and prepared the National Register nomination for the Beverly Shores Century of Progress Architectural District. See Appendix C.

Additional investigation and research was completed in 1993 when the national lakeshore contracted with the Historic American Buildings Survey (HABS) to complete a set of as-built measured drawings, large-format photographs, and written histories of the Century of Progress homes, including the House of Tomorrow. See Appendices A and B.

The 1997 General Management Plan, a compilation of management plans covering three distinct areas of the national lakeshore, was completed in August of that year. The stance taken by the national lakeshore was that long-term residential leases would be sought for each house, requiring strict maintenance of the structures and occasional tours. It also stated that if the Rostone and Florida Tropical houses were threatened by shoreline erosion they would be moved to the south side of Lake Front Drive.²

The 1997 Interpretive Plan briefly refers to the interpretation of the houses through a wayside exhibit. Funding for this was requested in 2001 through the Project Management Information System (PMIS), package number 22021.

In 1998 and 1999 the national lakeshore's Historical Architect, with the assistance of Todd Zeiger of Historic Landmarks Foundation of Indiana (HLFI), completed assessments of the house in preparation for the completion of this report.

In 2000 and 2001 Ms. Susan Schanlaber, a Chicago based Architect, Historic Preservationist, and developer, completed an extensive amount of research on the house to assist in the completion of this report.

Use Program

In November of 1993 the Historic Landmarks Foundation of Indiana (HLFI), a state-wide nonprofit preservation group, placed the Beverly Shores/Century of Progress Architectural District on the "Ten Most Endangered Landmarks in Indiana" list. The listing was done in an effort to gain public awareness of the state of the houses. HLFI then contacted the national

¹ General Management Plan, Indiana Dunes National Lakeshore (National Park Service, Department of the Interior, February 1980), 21-22.

² General Management Plan, Indiana Dunes National Lakeshore (National Park Service, Department of the Interior, August 1997), 34.

lakeshore to discuss the long-term plans for the houses and how they might assist in their preservation.

In an effort to preserve the houses, and the integrity of the historic district, the national lakeshore entered into a Memorandum of Understanding (MOU) with HLFi in June, 1996, with the intent that the Florida Tropical House, and any additional houses as may be agreed to³, be protected and maintained under the auspices of a residential leasing program. The Florida Tropical House was leased to HLFi for a period of 20 years, and in turn HLFi was responsible for recruiting potential lessees. The lessees would be responsible for completing the recommended treatment within the first 3 years of the lease following the Secretary of the Interior's Standards.

From 1996 through 2000, HLFi has been actively recruiting potential lessees for the Century of Progress houses, with support from the Cultural Resource staff of the national lakeshore. There have been numerous stumbling blocks to this process, including the limited time period of the leases, the cost of the projects, and the lack of financial incentive in the way of federal or state income tax credits. In response to these points several amendments to the original MOU have been written.

In October, 1997, an amendment was written specifying the inclusion of the Wieboldt-Rostone House, the House of Tomorrow, and the Cypress Log Cabin in the leasing program. July, 1998, brought a second amendment to the MOU which extended the lease of the houses to HLFi from 20 to 25 years. In January, 2000, HLFi's lease was again extended to 35 years, with a period of 30 years set for the individual lessees. In November, 2000, in response to a request from several potential lessees and HLFi concerning the Federal Tax Incentive Program for historic preservation an amendment was written that allows the lessees to sublet a house. The national lakeshore agreed to this with the understanding that it would be on a limited basis.

Project Goals

The goal of this report is to: provide a comprehensive understanding of the structure and its significance in order to address management objectives and comply with the Secretary of the Interior Standards for preservation; to assure the ultimate treatment is compatible with the preservation of the original structure's purpose and integrity; to preserve significant spaces, extant fabric, and original design intent as much as possible; and to provide a serviceable, safe, and enjoyable structure for the occupants and park visitors.

³ Memorandum of Understanding Between Indiana Dunes National Lakeshore and Historic Landmarks Foundation of Indiana, June, 1996. National Park Service, Indiana Dunes National Lakeshore, Cultural Resource Management files, Historic Landmarks Foundation of Indiana folder.

DEVELOPMENTAL HISTORY

Introduction

The House of Tomorrow was originally constructed for the 1933 Century of Progress Exposition. “The . . . Exposition opened in May of 1933 directed by the theme of science and its role in industrial advancement. Within the Home and Industrial Arts Group were model houses which featured modern materials, building methods and innovative home appliances, including the Armco-Ferro-Mayflower, Wieboldt-Rostone and Florida Tropical houses, and the House of Tomorrow. All utilized new techniques of design, construction and prefabrication in an attempt to bring the out-of-date housing industry into line with more efficient manufacturing practices such as those used by the auto industry.”⁴

The House of Tomorrow was designed by Chicago architect George Fred Keck and was built by Keck’s company, Century Homes, Inc., “as a temporary structure to display modern design and building techniques . . .”⁵ The house “is important as a record of the effects of European modernism on American architecture in the 1930’s. With its innovative structural system, glass walls, stripped-down ornament and modern materials, the House of Tomorrow embodies the ideals promoted by the fair and by modernist architects: science and technology as sources for design and as symbols of progress and future prosperity.”⁶

The Home and Industrial Arts Group was the most successful venue of the Exposition. More than 750,000 people toured the House of Tomorrow in the first year of the Exposition, and during the second year an additional 500,000 toured the house.⁷

After the close of the Exposition in 1934, Robert Bartlett, a Northwest Indiana real estate developer, purchased the House of Tomorrow and moved it, along with several other structures from the Exposition, to his new residential development in Beverly Shores, Indiana. Bartlett had “. . . built a 200-foot-long pier on the lake to receive the buildings; the houses were lifted by giant cranes onto the pier and then rolled across the dunes on timbers to their new locations.”⁸ In 1938 Bartlett sold the house to the first private owner. The house was sold several times between the years of 1940 and 1970 when it came into the possession of Indiana Dunes National Lakeshore.

Statement of Significance

The House of Tomorrow is located in the Century of Progress Architectural District, a National Register District. The nomination, dated October 21, 1985, states, “The Beverly Shores Century of Progress Architectural District is significant because it encompasses houses from the 1933/34 Chicago Century of Progress Exposition that comprised a portion of an exhibit known as the

⁴ Maria F. Ali, *The Century of Progress Documentation Project* (Washington, D.C.: Historic American Buildings Survey, Department of the Interior, 1994), 1, HABS No. IN-239. Appendix A.

⁵ Maria F. Ali, *The Century of Progress Documentation Project* (Washington, D.C.: Historic American Buildings Survey, Department of the Interior, 1994), 3, HABS No. IN-243. Appendix B.

⁶ Ali, 1, HABS IN-243. Appendix B.

⁷ Ward Jandl, *Yesterday’s Houses of Tomorrow*, 136.

⁸ Jandl, 138.

Home and Industrial Arts Group. Many of these structures were innovative and displayed engineering and construction technologies that have become an integral part of modern residential architecture.” The authors of the nomination stated, “In spite of . . . minor changes, all of the structures retain their integrity of design.” The authors focused on changes made to the Florida Tropical, Wieboldt-Rostone, and Cypress houses, noting that the Florida Tropical and Wieboldt-Rostone houses had been set on basements due to soil conditions.⁹

Although the National Register nomination states that the significance of the houses is unrelated to their current location, the role of the Century of Progress houses in the development of Beverly Shores has become apparent. A Determination of Eligibility¹⁰ recently completed on a property located in Beverly Shores included a concise history of the development of the town. It stated that Beverly Shores, developed by Frederick and Robert Bartlett of Chicago, was “One of the most ambitious recreational investments in the duneland . . .”¹¹ area. It was the 1920’s, and the Bartletts envisioned Beverly Shores as a grand resort such as those of Florida.

Beverly Shores was established by Frederick Bartlett in 1927. His “. . . plans proposed construction of two “large and modern hotels to rival the hostelryes of Atlantic City” and a South Shore railroad station.”¹² By 1930, he had built the administration building, the rail road station, and a clubhouse for the golf course. “To attract buyers, Bartlett established the Theater of the Dunes as summer headquarters for Chicago’s Goodman Theater Company.”¹³

Robert Bartlett, Frederick’s younger brother, purchased Frederick’s interest in Beverly Shores in 1933. His purchase brought a second phase of development, with the construction of a large hotel, a beach casino, infrastructure, and extensive landscaping projects along the major thoroughfares. Bartlett utilized aggressive marketing tactics to sell real estate in a Depression-battered market. “Mirroring the wild promotional schemes of the 1920’s real estate boom . . .”¹⁴ he moved the Century of Progress houses to Beverly Shores by barge and truck. Bartlett thought these high-profile structures would attract buyers’ to the development during a harsh business climate, however there is no definitive research with statistical data on how, or even if, his promotional schemes influenced property sales.

In 1946, Bartlett sold most of his Beverly Shores real estate holdings, but continued to use his home located there. The residents of Beverly Shores went to the polls in 1946 voting to incorporate as a town. The incorporation was certified on January 2, 1947.

Period of Significance

The period of significance, as stated in the National Register nomination, were the years of 1933 and 1934, when the House of Tomorrow was located at the Exposition site in Chicago. However, the Century of Progress homes were moved from their original location in January of

⁹ National Register Nomination, Appendix C.

¹⁰ Janice Slupski, 17 West Service Avenue: An Illustration of Dunes Area Recreational Development (Indiana Dunes National Lakeshore, Department of the Interior, 1997), paraphrased.

¹¹ Slupski, 4.

¹² Slupski, 5.

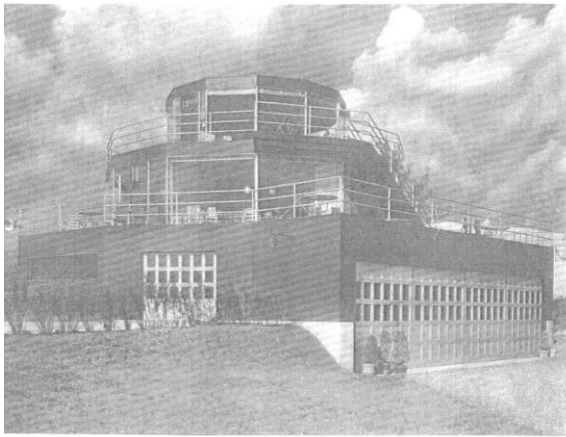
¹³ Slupski, 5.

¹⁴ Slupski, 7.

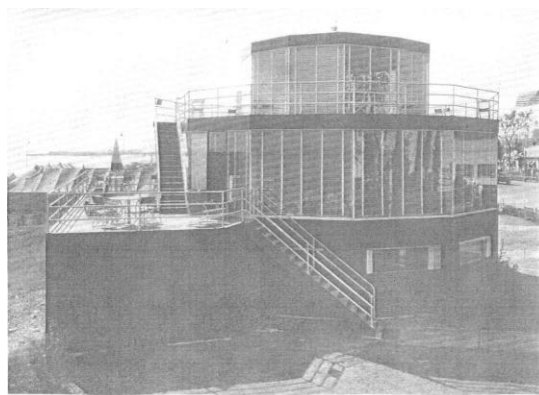
1935 to their existing sites in Beverly Shores, Indiana. The new setting and spatial relationships of the homes have developed their own significance as cornerstones in the development of the town of Beverly Shores. Thus, the period of significance extends from 1934 to 1947, including the years when Robert Bartlett was instrumental in the development of Beverly Shores.

Historic Photographs

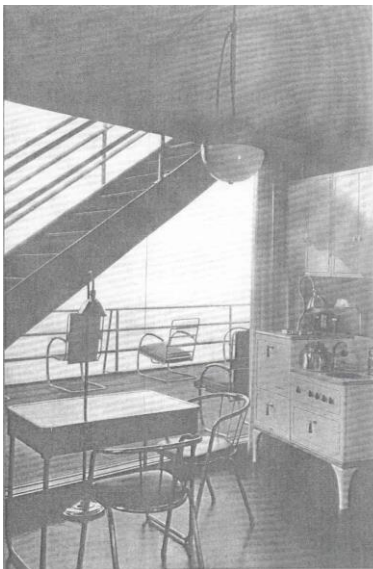
The House of Tomorrow was featured in several early publications. These pamphlets and books included photographs taken during the construction, and after the house was completed and furnished. The photos shown below were taken during the first year of the Exposition. See also Appendix D, Exhibits A, B, and C for additional photographs.



View of the first floor garage and hangar.



View of the second and third floors.



View of the original kitchen.



View of the original dining room.



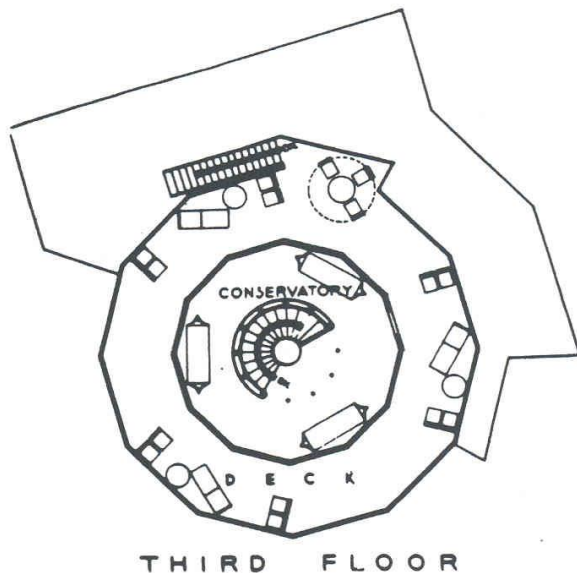
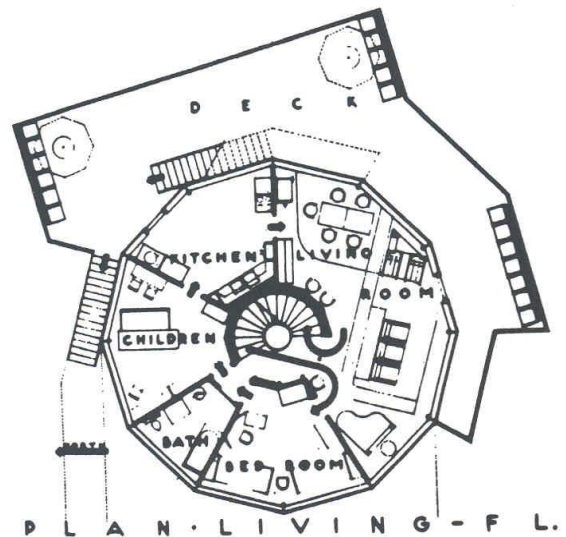
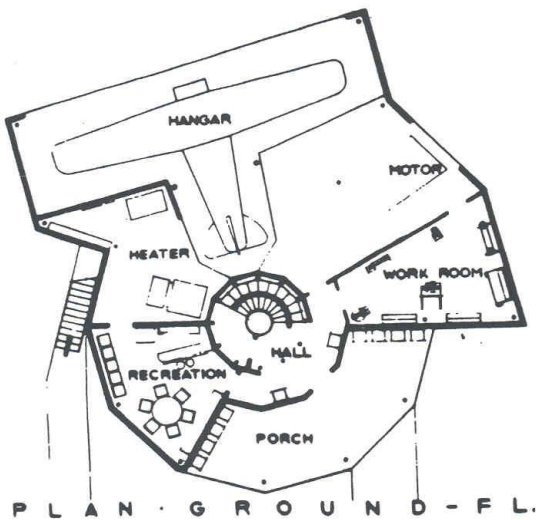
This historic photograph was taken in early 1935 as the Century of Progress houses were being moved from the Exposition site, by barge across Lake Michigan, to Beverly Shores, Indiana. This photo is of the Wieboldt-Rostone House, and is representative of the method used to move four of the five houses, including the House of Tomorrow. Note the heavy timbers under the house. It is probable that a combination of the crane and cribwork was used to lift the houses from the level of the pier to the level of Lake Front Drive.



This photograph will notice that floors of the H Armco-Ferro-M House of Tomc site to Beverly

Drawings

The first known drawings of the house, the architect's originals that were used to construct the house, include plans and elevations dated February and March, 1933. The drawings were located at the Wisconsin State Historical Society, Madison, Wisconsin. Historic Landmarks Foundation of Indiana (HLFI) maintains copies of these drawings. Sketch floor plans of all three floors were located in several publications. The first were books that were sold at the Exposition featuring each house within the Home and Industrial Arts Group.^{15 16} Those shown below were used in a publication produced for an exhibit of the Keck's work at the University of Wisconsin.¹⁷

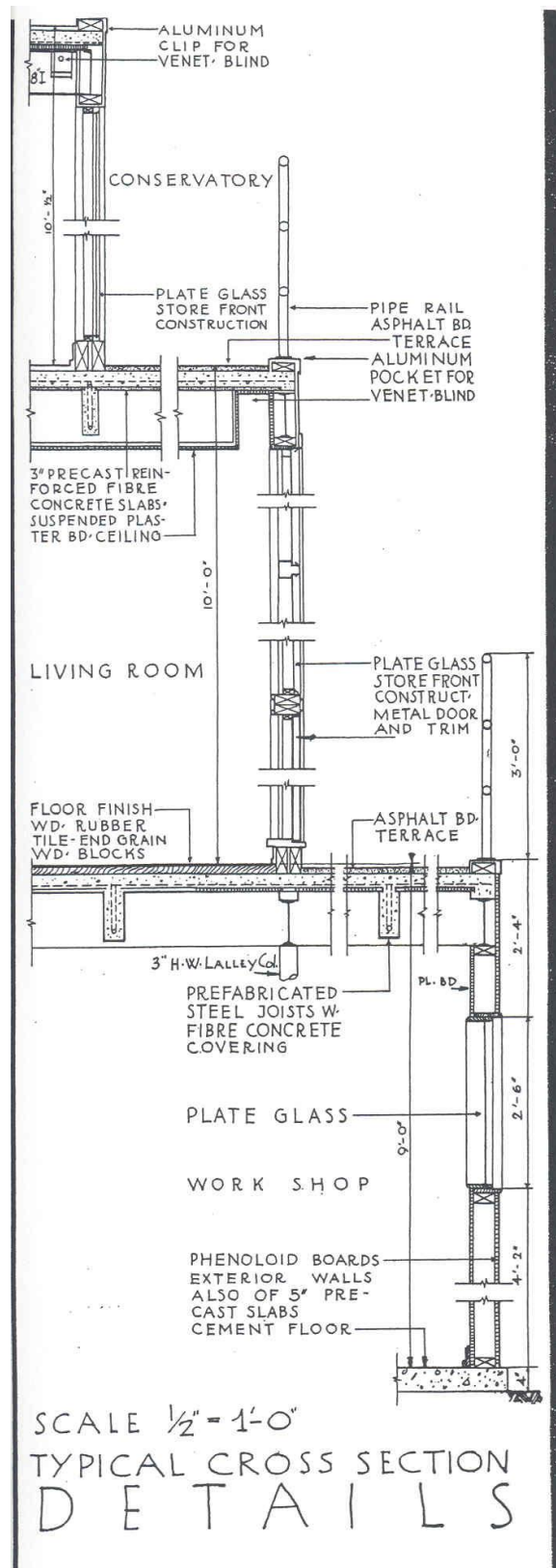


¹⁵ B. R. Graham, *House of Tomorrow, America's First Glass House*, 1933. Appendix D, Exhibit A.

¹⁶ Dorothy Raley, Ed., *A Century of Progress, Homes and Furnishings*, 1934.

¹⁷ Elvehjem Museum of Art University of Wisconsin Madison, *Keck & Keck, Architects*, 1980, 35.

A construction detail of the curtain wall system was located in a publication produced by Libbey-Owens-Ford entitled *Glass as an Architectural Medium*. See Appendix D, Exhibit B.



In addition, a set of as-built measured drawings was completed by the Historic American Buildings Survey (HABS), National Park Service, in the summer of 1994. These drawings included plans, elevations, sections, and details. See Appendix B for reduced copies of the drawings.

Century of Progress Architectural District – A Brief Comparison of Integrity

Of the remaining Century of Progress Exposition buildings, the House of Tomorrow has seen the most changes since the houses were moved to Beverly Shores, most notably in interior spatial relationships and replacement of exterior and interior finish materials. These changes, completed between 1935 and the early 1990's, range from the removal of the fixed glass curtain wall system on the second and third floor, to the addition of screened enclosures and a carport, to the addition and removal of interior walls, and finally to the significant alterations in interior wall finish materials. A list of known major alterations to the house is included in the Evaluation of Character Defining Features section of this report.

In comparison, the Wieboldt-Rostone House has seen only a few changes in its design since the Exposition. When it was moved to Beverly Shores it was set on a basement rather than on a flat concrete slab, and in 1950 it went through a major change in appearance when Perma-Stone was installed over the failing original Rostone panels. Since the national lakeshore discontinued use of the house as a science office and vacated it in 1985, it has experienced severe water damage resulting in the deterioration of interior finish materials including Rostone panels, stair treads, and risers.

The Florida Tropical House was also set on a basement after its move to Beverly Shores, and there were minor changes to the spatial organization of the first floor. The original bar area was modified to include a stair to the basement, a powder room, and a small dining area. In addition, the butler's pantry located adjacent to the kitchen was removed.

The Armco-Ferro-Mayflower House's original garage/display area was enclosed for use as a study, and due to lack of regular maintenance of the flat roof, roof leaks have developed over the years. The leaks have resulted in deterioration of interior plaster finishes on the first and second floor and in deterioration of some of the corrugated steel panels that comprise the structural system.

Finally, the Cypress Log Cabin and Guest House have seen only a few changes since their move to Beverly Shores in 1935, the most prominent being the change in the spatial relationship between the houses and the additions to both houses. Owners of the houses enclosed the original porch area of the main house for use as a bedroom, added a screened porch area, and closed a door between the exhibit room/living room and the display room/kitchen allowing for the addition of the kitchen, all completed prior to 1951.¹⁸ The interior spatial organization of the guesthouse was also modified, prior to 1951, from its original use as a workshop and display area to its Beverly Shores use as a guesthouse, and three additions were constructed.¹⁹

¹⁸ Interview with Joel Miller, February 19, 1999.

¹⁹ Interview with Joel Miller, February 19, 1999.

GEORGE FRED KECK, ARCHITECT

Design Philosophy

American architecture of the 1920's and 1930's was less intense in design than its European counterpart, and architects were freer to search for a variety of solutions in planning and construction. The romantic notion that each problem carries within itself its own solution had not been forgotten in America, and this became the central axiom in the architectural ideology of (George) Fred and William Keck.²⁰

Keck believed that the beauty of a building had to be a product of logic in planning and construction, and not of decoration or "style", . . ."²¹ He purchased a copy of Le Corbusier's *Towards a New Architecture* shortly after it appeared in its first English translation. Corbusier's idea that grain elevators, ocean liners, airplanes, and motorcars were important aesthetic objects made a very strong impression on Keck. The House of Tomorrow was indeed conceived in a spirit of engineering efficiency as a "machine for living".²²

The Century of Progress Exposition gave Keck an extraordinary opportunity, of which he took full advantage not unlike his International Style counterparts had done in similar European expositions. "I wanted to break the rules," says Keck, "like all young people." His work at the Exposition consisted of two houses, the House of Tomorrow and the Crystal House.²³ There is no symbolism attached to either building, other than their being two very good attempts of the 1930's to solve problems of housing through technology.²⁴

Keck's objective in the House of Tomorrow was to show how modern building supplies could be used gracefully and economically. So he asked the makers of glass and steel, and, due to the lack of available funds for construction, dozens of other companies to provide materials for what would be a modern showplace.²⁵

Keck said that he discovered the possibilities of solar heat in 1933 quite by accident. The House of Tomorrow was being constructed in the dead of winter, and after the house had been enclosed in its glass panels, the tradesmen working inside had to remove their coats because of the radiated heat of the sun. The Kecks were quick to note that the sun's rays could be captured in the design of houses.^{26 27} This surprised them because they had been told by mechanical engineers that the house couldn't be heated adequately due to the extensive use of glass. They later did extensive research on solar gain which benefited their design work and ultimately the work of the firm.²⁸

²⁰ Menocal, an essay, Keck & Keck, Architects.

²¹ Menocal.

²² Menocal.

²³ Nory Miller, Fred Keck: A 'new' hit, *Inland Architect*, May 1976, 7.

²⁴ Menocal.

²⁵ George A. Larson and Jay Pridmore, *Chicago Architecture and Design*, 146.

²⁶ Larson and Pridmore, 149.

²⁷ Miller, 8.

²⁸ Charles Storch, "2 brothers here designing solar buildings 40 years", *Chicago Tribune*, November 4, 1977.

The experience with the House of Tomorrow and the Crystal House, “. . . experiences that convinced him that the sun could be used instead of ignored in the heating of buildings, were to prove perhaps even more central to the direction his work took.”²⁹ Keck asked the U.S. Weather Bureau for assistance with research and was referred to his own “backyard,” the University of Chicago weather station, which provided him with readings on wind and sun angles. In 1937 Keck & Keck designed the B.J. Cahn house in Lake Forest, IL, which perhaps best typifies the work of the firm in the 1930’s. “Mrs. Cahn had somewhat flippantly asked for the “house of the day after tomorrow,” and she and her husband received what represented the cutting edge of Keck’s research into solar orientation. . . .”³⁰ He later unsuccessfully tried to interest Libbey-Owens-Ford to finance an experimental house, date unknown, but was rebuffed with the words, “My wife likes French Provincial architecture.”. . . After World War II, Libbey published a book about solar houses, in which a design by Keck was included, and they helped sponsor a year’s fuel economy test in a house built by Keck in Flossmoor, Ill. The study was cosponsored by IIT, whose record setting results made not only the architectural journals but also radio broadcasts and *Reader’s Digest*.³¹

The chairman of the 1977 National Passive Solar Conference was quoted, stating “They were solar pioneers, . . . not because they discovered some new or revolutionary thermal principle, but rather because they synthesized old ideas with new materials in an evolutionary way and created a substantial number of handsome and livable buildings.”³²

According to William Keck, one of George’s main concerns throughout the 1930’s and early 40’s was to familiarize the public with modern architecture.”³³

²⁹ Miller, 8.

³⁰ Miller, 8.

³¹ Miller, 8.

³² Storch.

³³ Menocal.

EVALUATION OF CHARACTER DEFINING FEATURES

A Brief Architectural Description of the House of Tomorrow

Keck drew his inspiration for the design of the house from the Octagon House built in 1853 near his boyhood home in Watertown, Wisconsin. The Octagon House had been designed according to ideas Orson Fowler had presented in his book *A Home for All*, written in 1848.³⁴ The Octagon House contained a central spiral stair wrapped around a utility core, and utilized new approaches to air circulation; a natural heating and cooling system drew air from the basement up through the hollow stairwell walls and out through the cupola. In addition, a fresh water system collected rain from the flat roof into a reservoir on the third floor, and then transferred it to a cistern where it was heated and used in the lavatories. A two-story porch originally extended around the house, but was subsequently removed. Could this porch have been Keck's inspiration for the sun decks surrounding the second and third floors? There are no quotes concerning it, however, since he had taken so much of his inspiration from the Octagon House we can assume that the porches did influence his design.

Keck's intent for the House of Tomorrow ". . . was not to give a specific form to his building, but rather to find a solution to the many and varied new requirements of a residence in a simple and direct manner."³⁵ He based the design on the prefabricated structural components and the air-conditioning systems that were available at the time.

Keck chose to design the house around the newly devised, water-cooled³⁶, air-conditioning system because there were ". . . air-conditioning systems that automatically keep the air within buildings fresh, odorless, dustless and of a constant temperature and humidity at all times and in all seasons."³⁷ It was assumed at the time that all buildings, both commercial and private homes, would have air-conditioning, and that it would ". . . be considered as necessary as central-heating and bathrooms . . ."³⁸ However, we must remember that air-conditioning systems were in their infancy, a fact that partially explains the failure of Keck's design which will be discussed in more detail later in this report.

It was thought that "An air-conditioning system works most efficiently when operated within a closed space, when its balance of air output and intake is not disturbed, as by open windows and doors."³⁹ So, with the flexibility from using a steel structural system that could carry the building loads and span long distances, a central air-conditioning system, and glass that was obtainable in much larger sizes than what could be produced previously, it was possible for Keck to eliminate exterior load bearing walls and the associated "inefficiencies" of operable windows within his design.⁴⁰

³⁴ Menocal.

³⁵ Graham. Appendix D, Exhibit A.

³⁶ Betty J. Blum, Interview with William Keck, FAIA, August 21 – September 12, 1990, 56.

³⁷ Graham. Appendix D, Exhibit A.

³⁸ Graham. Appendix D, Exhibit A.

³⁹ Graham. Appendix D, Exhibit A.

⁴⁰ Graham. Appendix D, Exhibit A.

Libbey-Owens-Ford was contracted with to supply the single-paned glass for the curtain wall system. Keck, however, had been warned against the extensive use of glass by mechanical engineers who felt that the “. . . unusual structure couldn’t be heated adequately with all its glass.”⁴¹ It should be noted that thermopane glass wasn’t introduced by Libbey-Owens-Ford until 1935 or 1940.⁴²

Keck felt that by using venetian blinds, roller shades (that rolled up from the floor), and curtains as window treatments the light through the glass walls could be controlled from absolute darkness to full light.⁴³ In addition, the venetian blinds had an aluminum colored finish to serve as heat reflectors.⁴⁴ These three elements, the blinds, roller shades, and curtains, were vital to the design of the building. (It was noted that during the second year of the Exposition the second Interior Designer added a set of heavier drapes, just inside the first set, much to the Keck’s distaste.)

The concept of sealed construction and use of large expanses of glass resulted in the ultimate failure of the fledgling air-conditioning system. While completing research the HABS Historian found that the air-conditioning could not handle the significant heat gain from the sun’s radiation during the Exposition, resulting in the closure of the master bedroom on the second floor to visitation.^{45 46 47} So, it is logical to say that, after the house was moved to Beverly Shores in early 1935, Robert Bartlett removed the curtain wall system, and installed wood framed walls and operable windows, to provide sufficient natural air circulation. This will be discussed further in this report.

Keck had said that he discovered the possibilities of solar heat by accident; it was while the House of Tomorrow was under construction, in the dead of winter, and the house had been enclosed in its glass panels. The temperature had dipped below 10 degrees outside however the tradesmen working inside had to remove their coats because of the radiated heat of the sun.^{48 49} This surprised Keck who had been told by mechanical engineers that the structure couldn’t be heated adequately.⁵⁰

Keck was quick to note that the sun could be captured in the design of houses.⁵¹ It was noted in an oral history transcript, from his brother William, that Keck had attempted to convince Libbey-Owens-Ford to work with him on a research project concerning the heat gain in the House of Tomorrow and the associated reduction in utilities cost, mainly that of fuel oil. William noted that during the month of October, when the Exposition was still open for visitation and the house was being heated, they were losing a lot of heat because of open doors. The Kecks found that

⁴¹ Storch.

⁴² Ken Butti and John Perlin, *A Golden Thread 2500 Years of Solar Architecture and Technology*, 183.

⁴³ Graham. Appendix D, Exhibit A.

⁴⁴ *Glass As An Architectural Medium*. Appendix D, Exhibit B.

⁴⁵ Interview with Maria Ali, 1994.

⁴⁶ Jandl, 134.

⁴⁷ Blum, 56.

⁴⁸ Larson & Pridmore, 149.

⁴⁹ Miller, 8.

⁵⁰ Storch.

⁵¹ Larson & Pridmore, 149.

the oil consumption was very low because of the heat gain, and they felt there was a chance to learn from it. Keck approached Libbey-Owens-Ford, and suggested they place a salaried employee in the house for the winter, while heating it, and monitor the costs of the fuel oil used. The Kecks knew there would be a definite savings because of what they had already seen in the fuel bills for October. The Executive Vice President said, “We’re not interested.”⁵²

Keck & Keck later did extensive research, based partly on University of Chicago weather station studies on solar heat gain, which benefited their later residential designs, and ultimately the work of the firm.⁵³

All three floors of the House of Tomorrow are duodecagon in configuration, “a shape that Keck claimed was derived from program demands and available standardized parts.”⁵⁴ “This shape was not selected arbitrarily but resulted from the number and sizes of the rooms required on the different floors and from the fact that the glass walls on each of these twelve sides would be of size that could be installed efficiently. Had this house been smaller or larger the number of sides would accordingly have been decreased or increased.”⁵⁵ The floor plan was considered to be very flexible due to the use of the steel structural system and the radiating configuration, noting that “The third or sun-deck floor can be enlarged and additional bedrooms and bathrooms located there. Complete new floors could be added above as nothing below would be disturbed.”⁵⁶

The three-story house was constructed on a concrete slab foundation. The structural system consists of the central utility core, i.e. a tube, constructed of thin steel plate (originally utilized as a chase for all mechanical equipment), wrapped by a spiral stair, and then encircled by a ring of tubular steel columns. This central core extends from the first floor through to the third. A second ring of tubular columns was placed just inside the exterior wall framing on the first floor and just inside the glass curtain wall system on the second floor. These rings of tubular columns support the steel I-beams that radiate from the utility core. The I-beams in turn provide support for the prefabricated floor and roof slabs made of fiber-concrete with integral fiber-concrete covered open-web joists. In addition, diagonal steel rods with turnbuckles were placed between the columns of the outer ring on the second floor at regular intervals as tension bracing.⁵⁷ It was Keck’s intent to leave the structural system exposed in many areas of the house, “This may appear strange at first glance. Tomorrow we will be accustomed to it and will know it to be right and proper and beautiful as we now consider Elizabethan exposed half-timbers and ceiling beams of wood.”⁵⁸ To Keck, steel and glass symbolized the possibilities of prefabrication and low maintenance living.⁵⁹ Thus we find that all components of the structural system are vital elements, both structurally and aesthetically, to the building’s design.

⁵² Blum, 69-70.

⁵³ Storch.

⁵⁴ Ali, 12, HABS IN-243. Appendix B.

⁵⁵ Graham. Appendix D, Exhibit A.

⁵⁶ Graham. Appendix D, Exhibit A.

⁵⁷ Ali, 10 paraphrased, HABS IN-243. Appendix B.

⁵⁸ Graham. Appendix D, Exhibit A.

⁵⁹ Miller, 8.

Keck's original plans called for phenoloid board, ". . . a type of vermiculate board."⁶⁰, as the exterior finish material on the first floor with aluminum facia between the first and second floors, and plate glass and aluminum curtain wall construction on the second and third floors.⁶¹ However, the aluminum industry was still a fledgling at this time.⁶² "Keck commented that changes were made after the plans had been completed due to problems obtaining materials."⁶³ The HABS report, however, does not indicate what materials he was commenting on. It is unknown whether or not the phenoloid board and the aluminum facia were painted black just after their installation, however all historic photos found to date have indicated they were painted for the 1933 Exposition season.

"For the 1934 season of the exposition, the original phenoloid board . . . was replaced with standing-seam copper, . . ."⁶⁴, having deteriorated due to exposure to humidity, rain, and snow. The copper, when installed in early 1934, was polished⁶⁵ ⁶⁶, however photographs from the 1934 Exposition season indicate that the copper was painted black after its installation. There has been no evidence found as to why the architect chose to paint the copper, or why the color black was chosen, however a reference was located that indicated there was a standard exterior color scheme for all buildings at the Exposition. "The Color Director, (on the Exposition Committee) . . . , used a water-base casein paint to enhance the solidity and sculptural quality of exterior planes and volumes; to relate buildings that differed in character, shape, and mass; to hide less aesthetic materials; and to heighten the carnival atmosphere. The unfading and pure colors applied to the wall surfaces were predominately white, blue, orange, and black. Silver, aluminum, and gold were used on roof areas."⁶⁷

The first story of the house was originally designed as service and utility space, and included a recreation room, mechanical room, workshop, garage, and airplane hanger. "To fit the plane into its snug hangar, a portion of the floor around the tires was cut away."⁶⁸ In addition, the first story included a recessed open porch along four sides of the duodecagon with the overhang supported by steel tubular columns; this area was later enclosed at Beverly Shores with screening by a resident. The second floor was originally designed as the primary living space, and included the living and dining rooms, kitchen, two bedrooms, and a full bath. A roof deck surrounds six sides of the second floor, however a wood framed and screened enclosure was added adjacent to the living area by a resident at the Beverly Shores site. The third floor was originally designed as a solarium, and was completely surrounded by a roof deck.⁶⁹

For the first year of the Exposition Keck worked closely with the Interior Designer to develop an uncluttered appearance "intended to preserve the impression of "space and freedom."⁷⁰ The

⁶⁰ Jandl, 132.

⁶¹ Ali, 4, HABS IN-243. Appendix B.

⁶² Interview with Al O'Bright, NPS, March, 16, 2001.

⁶³ Ali, 4, HABS IN-243. Appendix B.

⁶⁴ Ali, 5, HABS IN-243. Appendix B.

⁶⁵ Robert Boyce, *Keck & Keck*, 46. Appendix D, Exhibit C.

⁶⁶ Raley, Ed., 71.

⁶⁷ Boyce, 32.

⁶⁸ Jandl, 134.

⁶⁹ Ali, 10 paraphrased, HABS IN-243. Appendix B.

⁷⁰ Larson & Pridmore, 148.

furniture and interior finishes were of simple forms, but called attention to themselves through the use of rare and exotic materials, such as ebony, mahogany, walnut, chrome, and glass. “The most influential features of the House of Tomorrow were its chrome-tube furniture and metallic venetian blinds.”⁷¹ Keck’s design philosophy was to create an interior that would be essentially work free, and in doing so “Convenience became an aesthetic.”⁷²

Lee Atwood, an architectural designer who worked for Keck & Keck, had been hired by the firm because of his expertise in copying details. Keck designed most of the furniture for the house, however Atwood assisted by copying designs from photographs. After the Exposition much of the furniture was placed in the firm’s office or the Keck’s homes.⁷³

Chronological Listing of Known Major Alterations^{74 75}

Names given to each room are the most recent and historic use names, respectfully. See Appendix D, Exhibits D and E.

- ◆ 1934 – Removal of phenoloid board, replaced with standing-seam copper siding.
- ◆ Early 1935 – House moved to Beverly Shores, Indiana.
- ◆ Early 1935 – Removal of original second and third floor curtain wall window system, replaced with wood framed walls, sided with standing seam copper, and operable windows.
- ◆ Early 1935 – Original garage and hanger overhead doors removed, walls framed, and new operable windows installed.
- ◆ Circa 1935 – 1951 – First floor partitions added defining laundry room/hanger, $\frac{3}{4}$ bathroom/garage, and a bedroom/garage (where the dining room/garage is now). First floor $\frac{3}{4}$ bathroom/garage window also added.
- ◆ Circa 1935 – 1951 - Closets added in study/recreation room under central stair, laundry room/hanger, and second floor children’s bedroom.
- ◆ Circa 1935 – 1951 – Door between second floor living room and master bedroom closed.
- ◆ Circa 1938 – 1945 – Addition of carport and second floor screened enclosure on roof deck.
- ◆ Circa 1938 – 1945 – Exterior door added into hanger area from carport on east elevation.
- ◆ 1951 – The Miller family moved into the first floor as renters.
- ◆ 1951 – Window glass between first floor dining room/garage (then a bedroom) and bedroom/workshop was painted for privacy.
- ◆ 1951 – Acoustical drop ceiling added in first floor study/recreation room.
- ◆ 1958 – The Miller family purchased the house.
- ◆ 1958 – early 1990’s – Significant number of changes in interior finish materials. See Oral History, Appendix D, Exhibit D.
- ◆ 1959 – First floor partition removed that separated bedroom/garage from kitchen/hanger. The space was then used as a dining room until the house was vacated in 1998.
- ◆ Early 1960’s – Furred out area added in second floor master bedroom to conceal ductwork.
- ◆ 1961 – Insulation installed in first floor exterior walls.

⁷¹ Larson & Pridmore, 148.

⁷² Larson & Pridmore, 148.

⁷³ Miller, 8.

⁷⁴ Interview with Joel Miller, February 19, 1999.

⁷⁵ Interview with Mary Miller-Luxen, March 8, 1999.

- ◆ 1962 – First floor partitions added defining existing living room/hanger, kitchen/hanger, back hallway/hanger, and mechanical room.
- ◆ 1962 – New boiler and baseboard heat installed replacing oil forced-air furnace.
- ◆ 1965 – Original window in first floor study/recreation room destroyed during a storm, replaced with existing window.
- ◆ 1965 – Original drop ceiling removed in second floor living and dining rooms, exposing structural system.
- ◆ 1966 – Prefabricated fireplace and chimney added in second floor living room.
- ◆ Circa 1968 – 1970 – Wood paneling added on third floor and carpet installed over it.
- ◆ 1968 – Acoustical drop ceiling added in second floor kitchen. Original drop ceiling, although severely damaged, still in place.
- ◆ 1969 – Existing first floor kitchen/hanger extensively remodeled. Installation date of previous kitchen unknown.
- ◆ 1970 – Wood paneling installed over original metal clad paneling in existing first floor dining room/garage and bedroom/workshop.
- ◆ 1970 – House purchased by NPS on Oct. 26. The Miller family remained under a Reservation of Use and Occupancy agreement.
- ◆ 1971 – Drop ceiling installed in first floor kitchen/hanger.
- ◆ 1974 – Damaged original parquet floor in second floor living room near stair removed and replaced with plywood.
- ◆ Late 1970's – Partition between existing first floor laundry room/hanger and $\frac{3}{4}$ bathroom/garage removed.
- ◆ 1978 – Existing medicine cabinet/shelving system installed in second floor bathroom.
- ◆ 1985 – Copper siding at first floor entry stripped and varnished.
- ◆ 1987 – NPS, at request of residents, replaced roof and stabilized steel frame windows.
- ◆ 1988 or 1990 – Closets added in existing first floor bedroom/workshop.
- ◆ 1992 – Boiler replaced.
- ◆ 1998 – Special Use Permit expired Oct 26, 1997. The Miller family vacated in May, 1998.
- ◆ 1998 – Roofing felt installed on all levels, with exception under existing screened enclosure, and hot mopped with tar to stabilize roof.
- ◆ 1999 – Sections of parquet floor removed in second floor living and dining rooms, due to buckling, and stored.

Spatial Organizations

External

The spatial relationships between the Century of Progress homes have remained unchanged since their placement in Beverly Shores in 1935. However, due to natural succession, additions of landscaping features by subsequent owners, and a lack of regular maintenance, the once open lawns between the Cypress Log Cabin, the House of Tomorrow, and the Armco-Ferro-Mayflower House have become overgrown.

The integrity of the cultural landscape of the Century of Progress Architectural District has not yet been evaluated by Historical Landscape Architects. The national lakeshore has requested funding for the evaluation and the completion of a Cultural Landscape Report.

Internal

The internal spatial relationships of the first floor of the House of Tomorrow have seen numerous changes since the house was moved to Beverly Shores. The area originally designed as the airplane hanger has been subdivided into four spaces, while the area designed as the garage has been subdivided into three spaces. The internal spatial relationships of the second floor has seen only two modifications, the original door located between the Living Room and Master Bedroom that provided an uninterrupted circulation path for visitors at the Exposition has been closed off and a free standing gas fireplace was installed in the living room. The third floor has not been modified from its original configuration.

Exterior Appearance & Interior Room Function and Appearance

The following briefly describes the historic, and most recent, room functions, and significant features. Alterations made to the spaces between 1951 and 1998, during the previous residents' occupancy, are noted within this text, and can also be found within Appendix D, Exhibits D and E. The intent of these summaries is to assist the reader in developing a mental image of how the rooms appear. Specific information with regard to elements and building materials can also be found within the Existing Conditions and Treatment Recommendations sections of this report. Names given to each room are the most recent and historic use names, respectfully.

Please note, as you review the following material and the material in the Existing Conditions section of the report all building components are in varying degrees of deterioration due to a lack of regular maintenance by the previous residents during their occupancy. The lack of maintenance and neglect included not cleaning, repairing, or replacing the roofs, and allowing the family pet to urinate and defecate on the roof decks, resulting in severe deterioration and roof leaks over the years. The neglect also included a lack of regular maintenance on the window frames and sills resulting in severe water infiltration on all levels. They did not paint or caulk the sills, or caulk around the steel window frames either on the exterior or interior. The residents thought that making cosmetic changes, i.e. replacing existing interior finish materials with plywood, paneling, peg board, fiberboard, etc., and covering it with fabrics and/or carpet, was adequate for maintaining the building.

Exterior

To afford the construction of the house Keck convinced many different companies to donate materials and building components, noting that the companies would be able to take advantage of the advertising in books and brochures produced for the Exposition.⁷⁶

Original Materials & Systems⁷⁷

Structural Steel
Crex Patent Columns
Floor Construction
Alumilited Aluminum Sash
Window Glass
Air Conditioning System

Suppliers

Henry Pratt Co., Chicago
Crex Patent Column Co., Chicago
United States Gypsum Co., Chicago
The Zouri Co., Chicago
Libbey-Owens-Ford Co., Toledo, Ohio
Holland Furnace Co., Holland, Mich.

⁷⁶ "Chicagoing", Chicago Daily News, date unknown.

⁷⁷ Graham. Appendix D, Exhibit A.

The current exterior appearance of the house does not resemble that at the Exposition. As previously discussed, Keck's original design included a fixed aluminum and glass curtain wall system on the second and third floors, and, on the first floor the large overhead doors for the airplane hangar and the garage.

As previously noted, Keck's intent was that the house would be serviced by an air-conditioning system that would "automatically keep the air within . . . fresh, odorless, dustless and of a constant temperature and humidity at all times and in all seasons."⁷⁸ It was thought that an air-conditioning system would work most effectively within a closed space, with the balance of air output and intake not being disturbed by open windows and doors.⁷⁹ So, with the flexibility from using a steel structural system, a central air-conditioning system, and glass that was obtainable in much larger sizes, it was possible for Keck to eliminate all load bearing walls and exterior operable windows within his design⁸⁰, and, instead, use the glass curtain wall system as an exterior finish material. Libbey-Owens-Ford was contracted with to supply the single-paned glass for the curtain wall.

The concept of sealed construction and the use of single-paned glass within the curtain wall system resulted in the ultimate failure of the air-conditioning system, as previously mentioned. When the house was moved to Beverly Shores in early 1935 the curtain wall system was removed, the walls framed, and the operable windows were installed to provide sufficient natural air circulation.

The vertical standing-seam copper siding on the first floor had already been installed at the Exposition site in 1934 to replace the deteriorating original phenoloid board. When the glass curtain wall system was removed from the second and third floors in 1935, and the exterior walls framed, these floors were also sided with standing-seam copper.

Carport and Screened Enclosures Additions

During the oral history interviews with Joel Miller and Mary Miller-Luxen both indicated that the owner of the house from 1945 – 1958 could not have afforded these additions because she relied on the rent the Miller family paid, from 1951 – 1958, "just to get by". Since the house remained in the ownership of Bartlett from 1935 - 1938, this indicates that the additions are circa 1938 – 1945. The carport and the screened enclosure are both of wood frame construction.

Interior

A variety of finish materials were used at the Exposition to showcase new and innovative materials by many different manufacturers; noting again that Keck had contacted many companies asking if they would donate materials in lieu of the advertising they would get in the Exposition books and brochures. Each material was chosen to complement the use of the particular room it was used in, "The floors are of rubber tile, end-grain block wood, wood and

⁷⁸ Graham. Appendix D, Exhibit A.

⁷⁹ Graham. Appendix D, Exhibit A.

⁸⁰ Graham. Appendix D, Exhibit A.

concrete, each flooring material used where it serves its purpose best.”⁸¹, and to create a low maintenance living environment⁸².

The curtain wall system was designed with a metal baseboard to accommodate the electrical outlets, and dimmers were used on each floor to control the light intensity.⁸³ Keck chose to use portable and adjustable lamps to generate a soft lighting effect, and added colored filters in the master bedroom to produce a quiet restful light.

<u>Materials</u>	<u>Supplier</u>
Master Metal Insulation	Reynolds Metal Co., Inc., Chicago
Hangar & Garage Doors	Overhead Door Corp., Hartford City, Ind.
Metal Partition and Doors	Met-L-Wood Corp., Chicago
Metal Trim & Metal Wire-Way Base	Knapp Bros. Mfg. Co., Chicago
Carrara Glass	Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Asphalt Plank Terrace Flooring	Servicised Products Corp., Chicago
Rubber Tile Flooring	Goodyear Tire & Rubber, Co., Akron, Ohio
Pine End-grain Blocks	Dierkes Lumber & Coal Co., Kansas City, Mo., and Osgood-Corson-Ratcliff Co., Chicago
Walnut End-grain Blocks	American Walnut Mfrs. Assn., Chicago, and Osgood- Corson-Ratcliff Co., Chicago
Lacquers (used on walls)	Pyroxylin Products, Inc., Chicago
“Valdura” Asphalt Aluminum Paint	American Asphalt Paint Co., Chicago
Folding Doors	Folding Products Corp., Chicago
Finished Hardware	Sargent & Co., Chicago
Bathroom Fixtures	Crane Company, Chicago
Shower Sprayshield	Lehman Sprayshield Co., Philadelphia, Pa.
Kitchen Cabinets	Elgin Stove & Oven Co., Elgin, Ill.
Monel Metal Counters	International Nickel Co., New York, N.Y.
Hot-Point Range	General Electric Co., Cleveland, Ohio
Refrigerator in Kitchen	General Electric Co., Cleveland, Ohio
Electric Dishwasher	General Electric Co., Cleveland, Ohio
Refrigerator in Recreation Room	Gibson Refrigerator Corp., Greenville, Mich.
Venetian Blinds	Hough Shade Co., Janesville, Wis.
Window Shades	The Western Shade Cloth Co., Chicago
Drapery Hardware	Kirsch Company, Sturgis, Mich.
Curtains & Counterpanes	(Celanese Corp.) Marshall Field & Co., Chicago
Concealed Lighting	Curtis Lighting Co., Chicago
Color Filter Ill. (Master Bedroom)	Beatrice Irwin, 218 E. Huron St., Chicago
Lamps	Cooper, McGurk & Steward, Inc., Chicago

Additional information concerning artwork, furniture, and small appliance suppliers can be found at the end of Appendix D, Exhibit A.

⁸¹ Graham. Appendix D, Exhibit A.

⁸² Jandl, 134.

⁸³ Graham. Appendix D, Exhibit A.

First Floor – As you leave the entry hall you will proceed clockwise.

Please note that when the house was moved from Chicago in early 1935 the first floor, due to its size and irregular shape, might have either been cut in sections and moved by barge or dismantled and moved by truck. There have been no records found indicating the exact method Bartlett utilized to move this part of the building, however, during the physical investigation a painted floor was found in the mechanical room that matches the description of the original color. This could indicate that either the slab was moved with the first floor or that Bartlett intentionally replicated the floor finishes when the building was reconstructed on site in Beverly Shores.

Front Porch

As you approach the front of the building you will notice that the front porch area, comprised of four quadrants of the duodecagon, is recessed; the back wall lies beyond the building line of the second floor. The standing seam copper siding within the porch area was stripped, with a rotary sander, and varnished in 1985 as a birthday present for Mary Miller-Luxon, the previous resident, from her son Joel Miller.⁸⁴ The screened enclosure was in place when the Millers moved-in in 1951, and the concrete floor was covered with Astroturf from 1978 to 1998. The Astroturf was painted every year. Part of the screened enclosure and all of the Astroturf were severely damaged during a storm in late 1998, and have since been removed by the national lakeshore. The painted concrete floor was exposed when the Astroturf was removed, revealing a deep red base color that had been covered with a dark gray paint.

Entry Hall

Upon entering the front door your eye focuses on the dominant forms of the center tube, the circular stair, and the surrounding tubular columns. Keck designed the center tube as a vertical chase for the HVAC, plumbing, and electrical services. The surrounding circular stair leads to the second floor, and then continues on to the third. The tubular columns provide a majority of the structural support for the building. As previously mentioned, this central stair and utility core were inspired by the Octagon House near Keck's hometown that had been built in 1853.

The walls and ceiling of the entry hall were originally covered with plasterboard. The walls of the stairwell were covered with plasterboard, the vertical ductwork left exposed, and the concrete treads covered with black rubber tile; which is still in existence under the carpet. The tubular columns have been painted repeatedly, and the plasterboard in the entry hall has been obscured with the addition of a veneer of oyster shells. (The previous resident worked as a restaurant from 1970 until 1980, and in the evenings she would bring home a bucket of fresh water oysters for dinner.) The plasterboard ceiling was replaced with a painted Masonite by the previous residents. The original floor finish material is unknown; the existing is ceramic tile that was installed in 1980 over a black tile. The original metal clad front door was removed by the previous resident, however the original door knocker is still in existence and might be returned to the national lakeshore. Overall, the space is in fair condition.

Study/Recreation Room

This room was decorated as the recreation room for the Exposition, including a bar and storage space for athletic equipment. The prefabricated concrete and steel structural system for the floor

⁸⁴ Interview with Joel Miller, February 19, 1999.

above was originally left exposed as the ceiling. The walls were finished with plasterboard painted a “dead white” to contrast the bright blue ceiling and the exposed ductwork; the ductwork having been painted a “spectrum of colors”. The ductwork was an important visual element in the design of the first floor. The original blue paint is still evident on the ceiling.

The room, used as a study by the last residents, has undergone significant changes in finish materials since 1951. The existing wall finish materials include: plywood and insulation installed in 1961; painted paneling installed in the late 1960’s; and a second generation of fabric over fiberboard that was installed in 1979 replacing a previous fabric, date unknown. From an oral history interview it appears that there was a ceiling of 1” x 4” boards, set on a diagonal as furring strips, with acoustical tiles attached when the previous residents moved in 1951, however this contradicts research that states the structural system was left exposed. The furring and acoustical tiles were removed in 1951 and a drop ceiling system was installed. The original flooring was a bright blue rubber tile; the existing material is carpet that was installed in 1974. The original window, destroyed during a storm in 1965, was replaced with the existing wood frame unit. The room is in poor condition.

Mechanical Room

This area has always been used as the mechanical room, however changes in the locations of the partition walls, separating this area from the back hall and the kitchen, were made in 1962. The structural system for the floor above was originally left exposed as the ceiling. The walls were originally finished with plasterboard painted with aluminum paint to contrast the primary colors of the exposed ductwork, an important visual element in the design of the first floor. The original plasterboard has been removed, date unknown, and a fiberboard and Masonite pegboard were put in its place. The exposed concrete floor was originally painted a shade of red/orange at the Exposition. The last residents maintained the painted floor, also choosing a shade of red/orange. Numerous changes in the electrical and HVAC systems have been made over the years, accounting for the number of pipes and conduits hanging from the exposed structural system. A new boiler and baseboard heat was installed in 1962, replacing the original forced-air furnace. The boiler was replaced in 1992. The room is in poor condition.

Back Hall (Part of the Original Mechanical Room)

The carport was added sometime between 1938 and 1945 according to oral history, see Appendix D, Exhibit D, however it is unknown whether or not the back door was added during that time period. The partition between the back hall and the mechanical room was added in 1962. The structural system for the floor above was originally left exposed as the ceiling. The exterior wall was originally finished with plasterboard. The existing wall finish material is painted wood paneling. The exposed concrete floor was originally painted a shade of red/orange at the Exposition; the existing finish material is ceramic tile that was installed in 1980. The area is in poor condition.

Living Room (Part of the Original Airplane Hanger)

When the structure was set on site in early 1935 the hanger door was eliminated, the exterior wall framed, and the operable windows installed. The original hanger was subdivided in circa 1935 - 1951, however it is unknown in what sequence the division occurred. The original wall

finish material in the hanger area was plasterboard, with the structural system for the floor above left exposed as the ceiling.

The existing living room, which encompasses approximately two-thirds of the original hanger width, has seen several changes in partition wall locations and finish materials since 1951. The partition walls between the back hall and living room, and the kitchen and living room, were added in 1962. The existing finish materials include: an early plasterboard on the wall separating the living room from the laundry; paneling installed in 1962; damask (1992) over plywood (1961 when the previous residents installed insulation); and decorative concrete block. There is no historic reference as to the floor finish used in the hanger area. The existing finish is carpet that was installed in 1983 over a layer of carpet that matches that installed in the bedroom in 1974 over a bare concrete floor; the color is unknown due to damage caused by mastic. The previous resident had noted that black tile had preceded the carpeting which visible evidence, i.e. a 6" x 6" grid on the concrete, suggests. The room is in poor condition.

Laundry Room (Part of the Original Airplane Hanger)

The existing laundry room encompasses the remaining one-third of the width of the original hanger. As noted, the subdivision of the hangar occurred circa 1935 – 1951. The room was used as a bedroom from 1951 – 1958, while the previous residents rented the first floor of the house, and from 1958 – 1998 as a laundry and dressing room after they had purchased the house. Several closets had been added to accommodate the last resident's wardrobe, date unknown. The wall that separated this room from the $\frac{3}{4}$ bathroom was removed in the late 1970's. The structural system for the floor above was originally left exposed as the ceiling, and remains so today. The original wall finish material in the hanger area was plasterboard; the existing materials are plasterboard, and plywood that was installed in 1961 when they insulated the first floor. There is no historic reference as to the floor finish used in the hanger area; the existing is black rubber tile that predates 1951. Gaining inspiration from Jackson Pollack, the tile has been splatter painted. The room is in poor condition.

$\frac{3}{4}$ Bathroom (Part of the Original Garage)

The first floor bathroom, with window, was added to the house circa 1935 – 1951. Originally this area was part of the garage. The space now opens directly into the laundry room, with the wall having been removed in the late 1970's. The structural system for the floor above was originally left exposed as the ceiling, and remains so today. The ceiling was painted with aluminum paint in 1989, and resembles scrunched aluminum foil. The original wall finish material in this part of the garage was plasterboard; the existing material is ceramic tile installed in 1990 over an unknown substrate. There is no historic reference as to the floor finish used in the garage area; the existing material is ceramic tile installed in 1990. The wall cabinet was added in 1972 and the sink and toilet were installed in 1990. The room is in poor condition.

Kitchen (Part of the Original Airplane Hanger and Garage)

This area was originally part of the hanger and the garage. The subdivision of the space occurred circa 1935 – 1951. The tail of the plane would have rested approximately where the freestanding countertop is currently located in the center of the space. Earlier partition walls were relocated to their existing positions in 1962, i.e. the partition separating the kitchen from the mechanical room, and the kitchen cabinets and equipment were installed during a substantial remodeling

project in 1969. There is no record of the previous cabinetry or equipment, however it is known through oral history that a kitchen existed in this location from at least 1951.

The existing kitchen visually and physically dominates the first floor, however the large vent unit over the centrally located stovetop and grill breaks the visual connection between the kitchen and the surrounding rooms. The structural system for the floor above was originally left exposed as the ceiling. The drop acoustical panel system was added in 1971. The original wall finish material in the hanger area was plasterboard; the existing material is fabric over plasterboard, decorative concrete block, 1" x 10" vertical boards, and ceramic tile over an unknown base. There is no historic reference as to the floor finish used in the hanger area; the existing material is carpet installed in 1983 over a layer of carpet that matches that installed in the bedroom in 1974 over red rubber tile, only some of which remains. The room is in poor condition.

Dining Room (Part of the Original Garage)

During the Exposition this area was the garage, however when the house was placed on site in early 1935 the garage door was eliminated, the exterior wall framed, and the operable window installed. Prior to 1951, the exact date is unknown, a partition wall had been added separating this area from the kitchen, and allowing for use of this area as a bedroom. The wall was removed in 1959 reopening the space to the kitchen, and allowing for its use as a dining room. The original wall finish material in the garage area was plasterboard and metal covered insulation board.

There have been significant changes in the finish materials since 1951, however the original metal covered insulation board on the wall separating this area from the workshop is still in place. Other existing finish materials include decorative concrete blocks that were installed in 1962, and 1" x 10" vertical boards that were installed in 1967 over the original metal covered insulation board. The structural system for the floor above was originally left exposed as the ceiling, and remains so today. There is no historic reference as to the floor finish used in the garage area; the existing material is carpet installed in 1983 over a layer of carpet that matches that installed in the bedroom in 1974, over a painted concrete floor; the color is unknown due to damage from mastic. The room is in poor condition.

Bedroom/Workshop

The once pristine workshop has seen numerous finish material modifications since the house was moved to Beverly Shores. The primary original wall material, a metal covered insulation board, was originally painted with aluminum paint to contrast the orange painted concrete floor. The metal paneling, still in existence, has since been obscured by the addition of wood paneling, installed in 1970, and clothes closets installed in either 1988 or 1990. The exterior wall was originally finished with plasterboard and has been covered with two or three generations of carpet; the first having been a shag that was removed in 1970, and the existing which is either the 1970 replacement or the 1974 replacement. In addition, the original observation window between the workshop and garage was painted over for privacy in 1951; the room having been used as a bedroom from at least 1951 until 1998. The existing floor material is carpet installed in 1974 over +/- 18" x 24" black rubber tile that had been installed over the painted concrete floor. The structural system for the floor above was originally left exposed as the ceiling, and remains so today. The room is in poor condition.

Second Floor - As you leave the central stair, turning right, you will proceed clockwise.

Master Bedroom

Of all the rooms in the house, the master bedroom retains the highest percentage of original finish materials, and overall is in fair condition. The original wall finish materials included the floor-to-ceiling glass curtain wall system, end-grain pine blocks on one partition wall, and plasterboard painted a warm pink on the other partition walls. The ceiling was a dropped construction of wood framing finished with plasterboard, and the floor was covered with end-grain pine blocks.

The wall separating the bedroom from the living room retains the framing for the original door opening between the rooms. This door had been closed off circa 1935 – 1951. The existing finish materials include: the end-grain blocks which are in pristine condition; carpet and fabric over plasterboard; and fabric over burlap over drywall. The fabrics were added in the late 1960's when the house was redecorated in shades of browns. The furred out area in the corner was added in the early 1960's to cover a vertical duct, however when it was constructed the original base for the electrical outlets was moved to accommodate this addition, and reused. There is also a ghost mark on the floor indicating where the previous resident had added a closet, date unknown.

The original drop ceiling is still in place, however it has received a small amount of water damage from roof leaks. The original ceiling cove, adjacent to the exterior wall, where the venetian blinds and roller shades hung is in good condition. One of the original drapery tracks, attached directly to the ceiling⁸⁵, is still in place and could be used as a template for reinstalling tracks in every room on the second floor.

The end-grain blocks used as the floor finish are in fair condition, having received some damage from furniture and shoe scuffs, and roof leaks. From oral history, some rows of the parquet were cut with a rotary saw, opening up the joints between rows, to eliminate warping. According to the previous resident the warping occurred on a regular basis due to humidity changes.

Bathroom

The original fixtures, including the white porcelain sink and tub, are still in place, as is the original plate glass tub surround. However the tub has been refinished in black, date unknown. The white porcelain toilet is a replacement, date unknown. The original wall finish materials included the floor-to-ceiling exterior glass curtain wall, and polished white Carrara glass panels on the partition walls. The ceiling was a dropped construction of wood framing finished with plasterboard, and the floor was covered with pink rubber floor tile. The existing medicine cabinet was installed in 1978, however the original mirror is still in existence and can be reinstalled. The existing wall finishes include: painted plasterboard; carpet over the plasterboard; and white Carrara glass panels, many of which have been broken or have cracked. The original pink floor tile is in existence, however black vinyl tile had been laid over it, and carpet was installed over the black tile in 1990. The room is in poor condition.

⁸⁵ Graham. Appendix D, Exhibit A.

Children's Bedroom

During the exhibition this simple room contained custom built cabinetry designed for children, including a very large fish tank placed at eye level. None of the cabinetry remains in the house today, having been removed at the end of the 1933 Exposition season. The original finish materials included the floor-to-ceiling glass curtain wall, and plasterboard on the partition walls painted a pure turquoise. The ceiling was a dropped construction of wood framing finished with plasterboard, and the floor was covered with a deep tone of green rubber tile. The existing finish materials include aluminum painted fabric over the original plasterboard on the partition walls, as original paint evidence indicates, and carpet over drywall on the exterior walls. The carpet and the fabric were both installed in the mid-1960's. In addition, the original turquoise rubber floor tile was covered with carpet in 1974. The room is in poor condition.

Kitchen

The once pristine kitchen, Keck's representation of the most modern appliances and finish materials, is in poor condition. The original wall finish materials included the floor-to-ceiling glass curtain wall, and plasterboard on the partition walls painted sand to match the enameled metal cabinets. The ceiling was a dropped construction of wood framing finished with plasterboard, and the floors were covered with a deep brown rubber tile.

Most of the original cabinets are still in place however they have been painted several times, and the only remaining original appliance, the dishwasher, hasn't worked in many years.⁸⁶ The plasterboard over the wood framed exterior walls is covered with carpet, and the interior partitions are finished with wallpaper over plasterboard, and ceramic tile over an unknown substrate. The ceramic tile was installed in 1975. The original drop ceiling of plasterboard was damaged from roof leaks, however most of it is still in place above the acoustical drop ceiling system which was installed in 1968. The original brown floor tile is still in existence, however it had been covered with black and white vinyl tile, date unknown. The black and white tile had been laid in an alternating stripped pattern matching the angles of the exterior walls, which matches the original tile in the solarium. The carpet was installed over the black and white tile in 1974.

Dining Room & Living Room

The dining and living room area does not reflect the same qualities it once did, such as the clean lines or spatial qualities of Keck's international design. The original finish materials in the dining room included the floor-to-ceiling glass curtain wall, and polished pale gray Carrara glass on the partition wall separating the dining room from the kitchen. The original wall finish materials in the living room included the floor-to-ceiling glass curtain wall, polished black Carrara glass on the walls around the stairwell, and plasterboard painted a pale soft gray on the partition wall separating the living room from the master bedroom. The ceiling in both areas was a dropped construction of wood framing finished with plasterboard, and the floors were finished with end-grain walnut blocks.

The predominant change on the second, and third, floor was the removal of the glass curtain wall system, as previously noted. While completing research the HABS Historian found that the original air-conditioning system could not handle the significant heat gain during the

⁸⁶ Interview with Joel Miller, February 19, 1999.

Exposition⁸⁷, so when the house was moved to Beverly Shores the operable windows were installed to provide sufficient natural air circulation and the walls surrounding the windows were finished with plasterboard. Today, however, not all of the windows are operable due to a lack of general maintenance by the previous residents and the extensive level of deterioration from water damage that has resulted from leaks around the windows. In addition, the original door between the living room and master bedroom, which provided an uninterrupted circulation path for visitors at the Exposition, was closed by previous residents, date unknown, and the flow of the space was interrupted by the introduction of a freestanding gas fireplace in the living room in 1966.

Due to severe roof leaks in 1965 the drop ceiling was removed in both the dining and living rooms, and the conduit for the dining room light fixture was removed. The parquet floor was removed near the stair due to water damage in 1974, replaced with plywood, and covered with carpet. Carpet was also installed over the aluminum painted plasterboard on the exterior walls in 1974, and fabric was hung over the plasterboard on the partition wall separating the living room from the master bedroom in 1978. This partition wall retains the original painted plasterboard, as indicated by paint evidence. In addition, one panel of black Carrara glass in the living room was broken during a game of billiards⁸⁸, date unknown.

These changes, and the severe level of deterioration due to years of roof leaks, has diminished the once polished look of a simple, yet imposing, interior. Overall, the rooms are in poor condition.

Hall

Adjacent to the living room, the walls of the hallway leading to the bedrooms and bath were covered with mirrors in 1966. Fabric was hung over the mirrors in 1978. The substrate material under the mirrors is unknown.

Stairwell

Keck located the dimmers for the lighting system, two large knobs, in the stairwell. One was located near the second floor, and one further up for the solarium.⁸⁹

Closets

The house did not contain permanent, built-in closets, at the Exposition. Instead, Keck utilized movable wardrobes for clothes storage lending added flexibility to the floor plan.⁹⁰

Roof Deck

The second floor roof deck is accessed by exterior doors from the living room and the kitchen, and by exterior stairs from grade. The deck, surrounded by a pipe railing, was used for entertaining and outdoor family activities by the residents. The wood framed and screened enclosure, added adjacent to the living room circa 1938 – 1945, is in poor condition. Overall, the deck is in poor condition.

⁸⁷ Interview with Maria Ali, 1994.

⁸⁸ Interview with Joel Miller, February 19, 1999.

⁸⁹ Joseph C. Folsom, "The House of Tomorrow", *Official World's Fair Weekly*, 1933.

⁹⁰ Jandl, 134.

Third Floor**Bedroom & Home Office/Solarium**

The solarium was originally designed by Keck to be an open space, and was finished with the floor-to-ceiling glass curtain wall and plasterboard. The roof's structural system was left exposed as the ceiling, and the floor was finished with black and white rubber tile laid in an alternating stripped pattern matching the angles of the exterior walls. As previously noted, the glass curtain wall was replaced in circa early 1935 with operable windows to provide sufficient natural air circulation and plasterboard was installed as the wall finish material. Sometime between 1968 and 1970 the plasterboard was removed, and replaced with wood paneling with carpet over it. The floor carpeting was installed in 1974 over pressboard over the original black and white vinyl tile. The space was used both as a bedroom and home office by the last residents with drapes hung between spaces to provide privacy. The room is in poor condition.

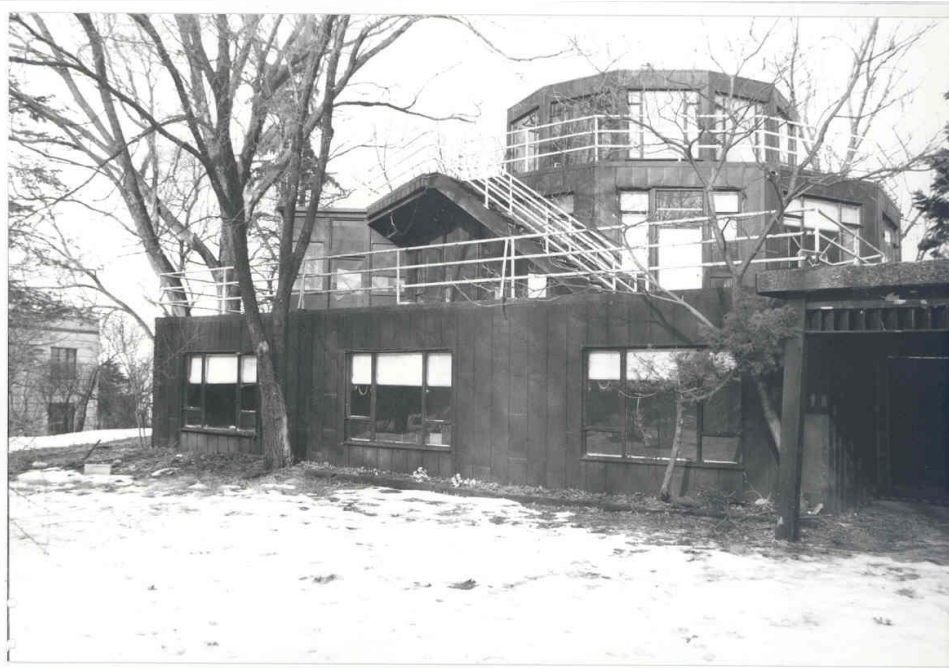
Roof Deck

The third floor roof deck is accessed by an exterior door from the solarium and by exterior stairs down to the second floor. The deck, surrounded by pipe railing, was used for entertaining and outdoor family activities by the residents. The previous resident remembers seeing a photograph taken during the 1940's that showed the entire third floor roof deck area "tented" in screen material, however this photo has not been located to substantiate this statement. Overall, the deck is in poor condition.

EXISTING CONDITIONS**Photographs – First Floor**

The following numbered photographs, referenced in the sketch floor plan below, were chosen to represent the overall existing conditions of the building. All numbered photographs are located in Appendix D, Exhibit F.

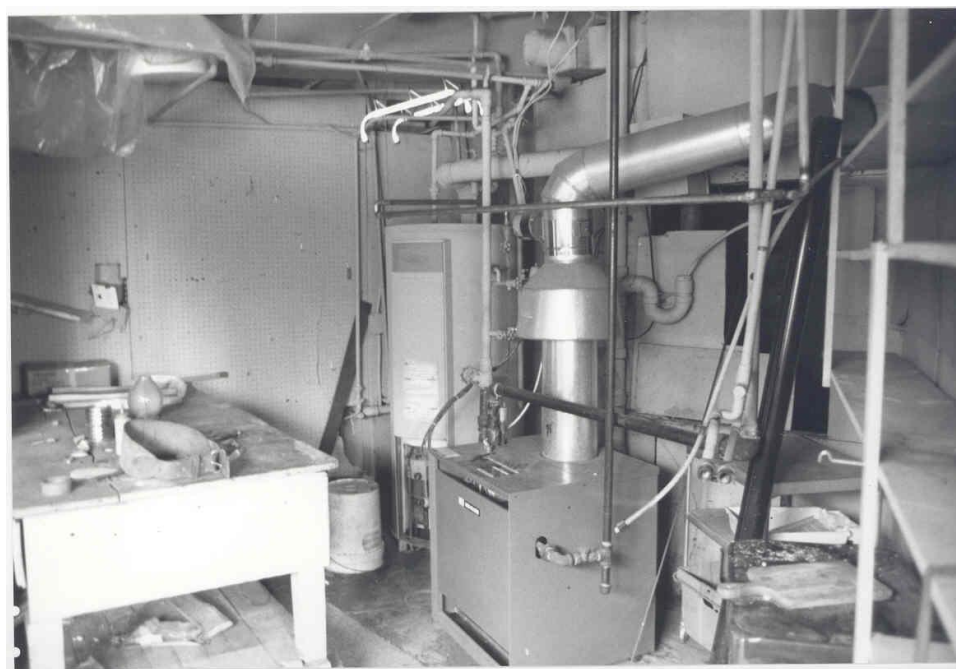
Field Photographs



View 4 – Southeast Perspective – Original Hangar Area

Field Photographs

View 32 – Bedroom/Workshop – South Wall and Closets



View 54 - Mechanical Room – Northwest View

Field Photographs



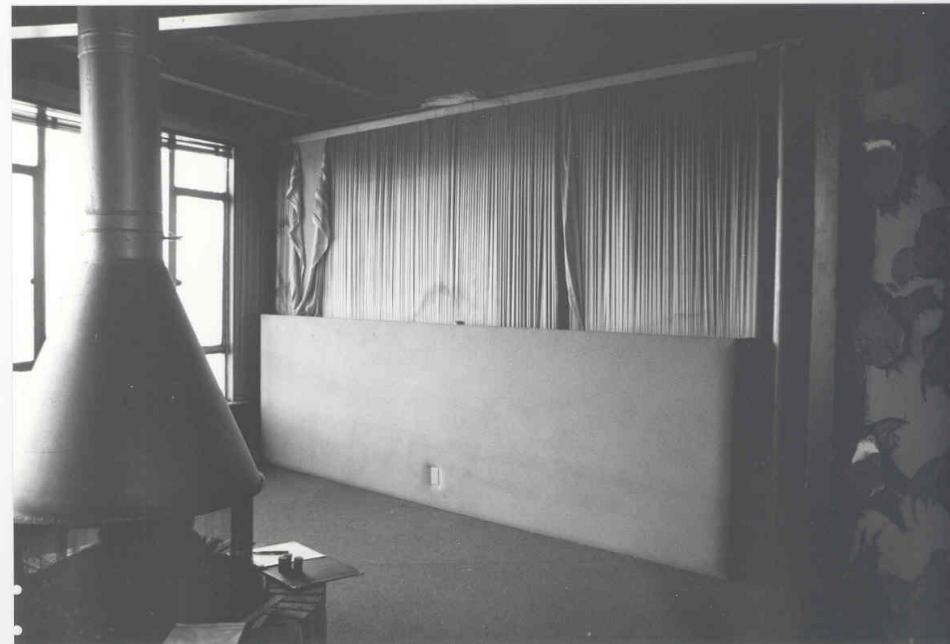
Field Photographs

View 58 – Front Porch – Looking East

EXISTING CONDITIONS (cont.)

Photographs – Second Floor

The following numbered photographs, referenced in the sketch floor plan below, were chosen to represent the overall existing conditions of the building. All numbered photographs are located in Appendix D, Exhibit F.

Field Photographs

View 2 - Living Room – East Wall – Note the addition of fabrics and the fireplace.



View 4 - Central Core – Note the use of Black and Gray Carrara glass, and the missing glass.

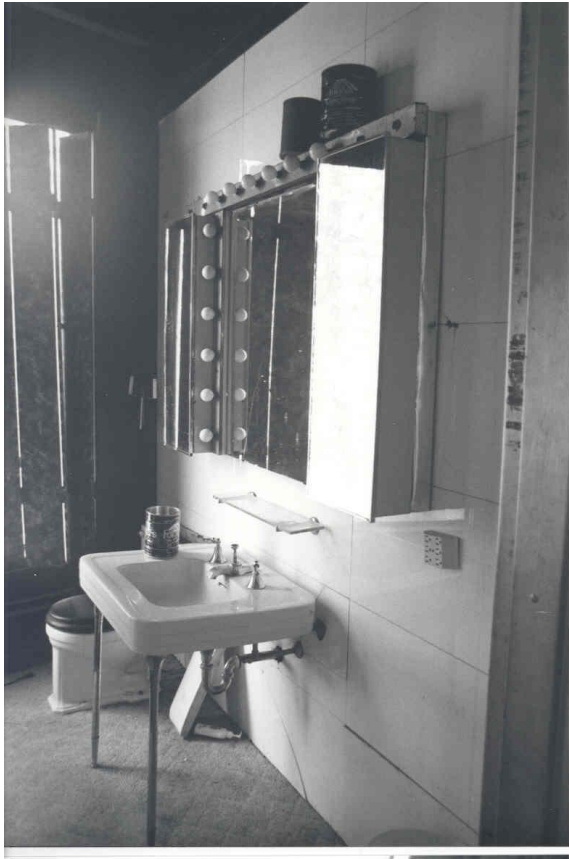
Field Photographs



View 9 - Kitchen – North Wall – Note the original dishwasher and cabinets.



View 15 - Children's Bedroom – West Wall – Note the aluminum painted fabric wall covering.

Field Photographs

View 19 – Bathroom – Carrara Glass



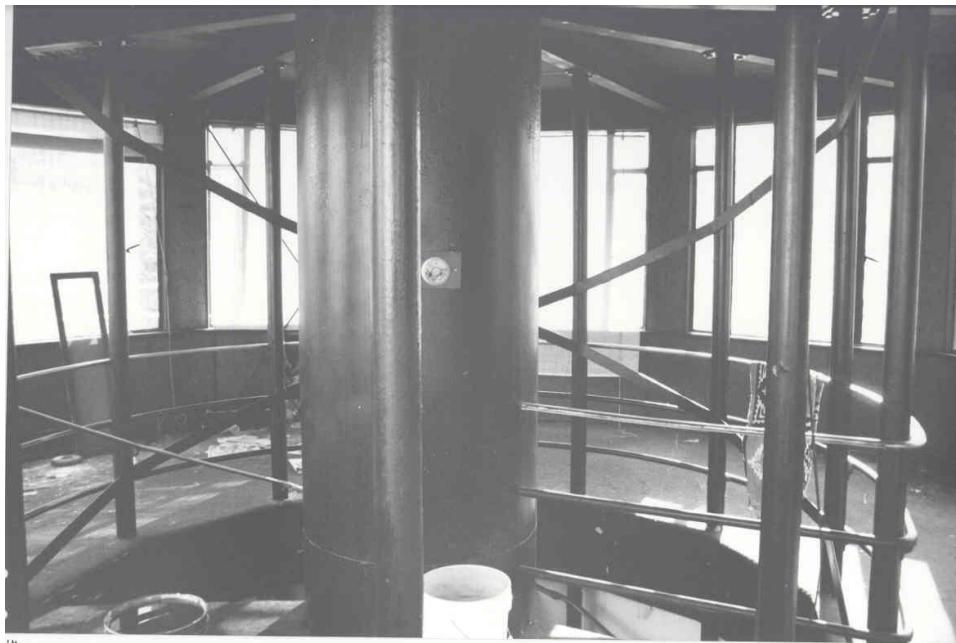
View 22 - Master Bedroom – Wall Parquet

EXISTING CONDITIONS (cont.)**Photographs – Third Floor**

The following numbered photographs, referenced in the sketch floor plan below, were chosen to represent the overall existing conditions of the building. All numbered photographs are located in Appendix D, Exhibit F.

Field Photographs

View 1 - Door to Roof Deck



View 3 - Central Core – Structural System

EXISTING CONDITIONS (cont.)***Evaluation Methodology***

The current condition of the house has been evaluated based upon the criteria listed in the Resource Management Plan Guideline, noted below. This guideline is utilized for the evaluation of structures for the NPS's List of Classified Structures. Please note, as previously stated, all building components are in varying degrees of deterioration due to a lack of regular maintenance by the previous residents during their occupancy (1951 – 1998).

Good

The structure and significant features are intact, structurally sound, and performing their intended purpose. The structure and significant features need no repair or rehabilitation, but only routine or preventive maintenance.

Fair

The structure is in fair condition if either of the following conditions are present:

- a) There are early signs of wear, failure, or deterioration though the structure and its features are generally structurally sound and performing their intended purpose; or
- b) There is failure of a significant feature of the structure.

Poor

The structure is in poor condition if any of the following conditions are present:

- a) The significant features are no longer performing their intended purpose; or
- b) Significant features are missing; or
- c) Deterioration or damage affects more than 25% of the structure; or
- d) The structure or significant features show signs of imminent failure or breakdown.

Unknown

Not enough information is available to make an evaluation.

Site Features**Siting**

The house is sited on a dune, on the south side of Lake Front Drive overlooking Lake Michigan, to the west of the Cypress Log Cabin.

Due to the surrounding vegetation, most notably large trees and undergrowth, this site is highly flammable.

Soils

“This sand dune area is comprised of Oakville fine sand with slopes of 18 to 40 percent. This type of soil, typically found on lake plains, low sand dunes, and beaches ridges, is deep and well drained. . . . In a typical profile, the surface layer is dark grayish brown fine sand about 5 inches thick. The subsoil is about 30 inches thick. . . . Some areas of this soil are strongly acid in the surface layer and subsoil. . . . This soil has low available water capacity and very rapid

permeability. The organic matter content of the surface layer is moderate. Surface runoff is rapid. . . . Most of the acreage of this soil is in woodland. Trees have stabilized the sand movement in these areas. . . . This soil has severe limitations for building sites because of the slope. . . . Foundations and footings should be constructed to provide stability for the structure and may need to be placed on pilings.”⁹¹

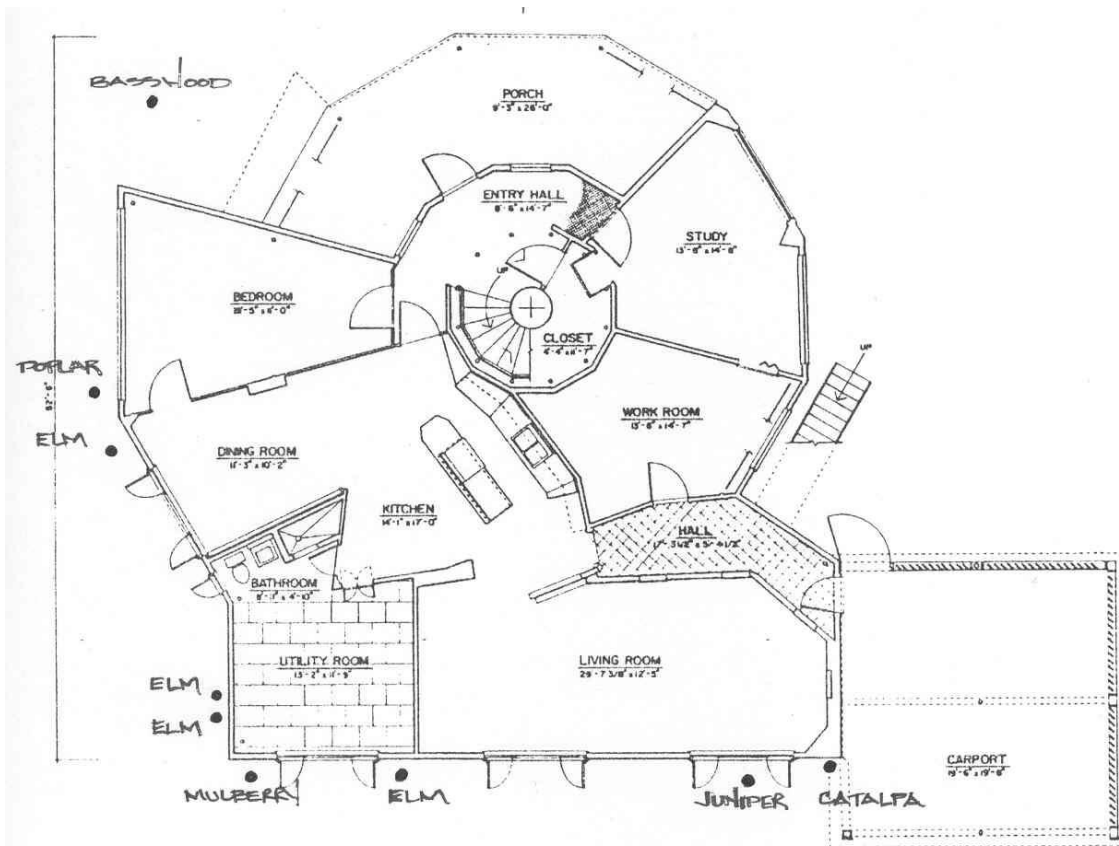
Grade

The site is relatively flat under the house, yet it slopes down abruptly from the shallow front yard to Lake Front Drive. It is accessed either by two set of concrete steps from Lake Front Drive, or from Carol Lane on the southeast side, which runs parallel to Lake Front Drive. The back yard is relatively level with Carol Lane. The adjacent lots, to the northeast, are relatively flat, however they are much lower than the House of Tomorrow site.

Vegetation

The area surrounding the site has a thick stand of young trees that have grown in the last twenty to thirty years.

1. The trees that were planted on the north, west, and south sides of the house are affecting the integrity of the structure. They are located too close to the exterior walls causing damage to the siding and roofing. In addition, the root systems are growing under the on-grade slab foundation.



⁹¹ Department of Agriculture, Soil Conservation Service, and Purdue University, Agricultural Experiment Station, Porter County Soil Survey, n.d.

2. There is a substantial stand of garlic mustard on site. Garlic mustard is an exotic species that the national lakeshore is in the process of eradicating.

Exterior Furniture

There is a concrete sidewalk, date unknown, at the front entrance of the house that continues around the east side of the house to the carport. The sidewalk is in poor condition because it has lifted in several places due to the shifting of the dune and the growth of adjacent trees.

Structure

General Building Description

1. This three-story structure is in poor condition as defined by the Resource Management Plan Guideline. The deterioration or damage affects more than 25% of the structure. Previous residents did little to maintain the structure, but instead made significant cosmetic changes.

2. The level of moisture in the structure is currently too high to begin any type of construction work.

Foundation

The on-grade concrete slab foundation is settling causing the front one-third of the structure to subside. The slab and flooring material in the entry hall have cracked. This movement is causing stress in the window glass in the study/recreation room and the bedroom/workshop, resulting in glass breakage. The type of reinforcing used in the slab and the overall condition of the slab are unknown.

Exterior Walls

1. The vertical standing-seam copper siding was installed at the Exposition in 1934 to replace the original phenoloid board that was deteriorating; not having withstood the humidity, rain, and snow. It is unknown whether or not the phenoloid board and the standing-seam copper were painted black just after their installation, however all historic photos found to date have indicated they were painted during the respective Exposition seasons. The HABS history states that the architect's original plans called for phenoloid board as the exterior finish material on the first floor with aluminum facia between the first floor and the second, and plate glass and aluminum curtain wall construction on the second and third floors.⁹² However, the aluminum industry was still a fledgling at this time.⁹³ "Keck commented that changes were made after the plans had been completed due to problems obtaining materials."⁹⁴, however it is unknown what materials he was referring to.

During the HABS research and research for this report, there were no drawings or specifications found concerning the production or installation of the copper. Several pieces of the copper had fallen off the first floor during the fall of 2000 due to the level of deterioration of the insulation board and wood framing beneath. It was found that these pieces had been attached with

⁹² Ali, 4, HABS IN-243. Appendix B.

⁹³ Interview with Al O'Bright, March 16, 2001.

⁹⁴ Ali, 4, HABS IN-243. Appendix B.

galvanized flathead nails, however an investigation has not been completed to determine if all the copper had been attached with the same type or similar fasteners.

Also during the HABS documentation each elevation of the structure was drawn utilizing two different methods. The first being a traditional elevation drawing and the second showing each section of the multi-sided structure laid out flat. Each section of standing-seam copper was detailed including horizontal joints. These drawings will be utilized to catalog the copper siding as it removed from the structure for repairs.

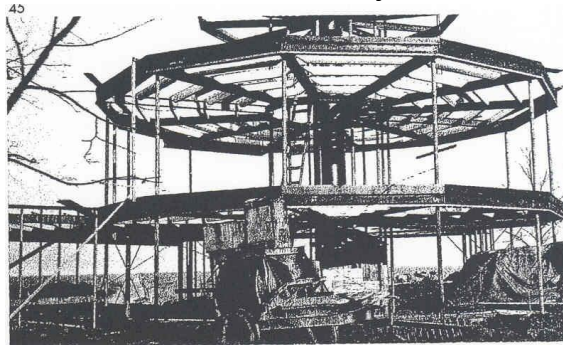
The overall condition of the copper siding is poor. It is marred by a build-up of caulk, paint, and roofing tar, and there are missing and damaged pieces on all levels.

2. The standing-seam copper siding in the first floor porch area was stripped of all layers of the original paint by the previous resident, using a rotary sander, in 1985 and varnished. The condition of the siding is poor.

3. The original garage and hanger doors on the first floor level were removed, the walls framed, and the operable windows installed, all circa 1935. The condition of the wall framing is unknown, and the condition of the windows is poor due to a lack of regular maintenance.

Framing

1. All three floors of the house are duodecagon in configuration, “a shape that Keck claimed was derived from program demands and available standardized parts.”⁹⁵ The structural system consists of the central utility core, a tube, constructed of thin steel plate (originally utilized as a chase for all mechanical equipment), wrapped by a spiral stair, and then encircled by a ring of tubular steel columns. The system is shown below in a photo taken while the house was under construction⁹⁶. This central core extends from the first floor through to the third. A second ring of tubular columns was placed just inside the walls on the first floor and just inside the curtain wall system on the second floor. These rings of tubular columns support the steel I-beams that radiate from the utility core. The I-beams in turn provide support for the open-web steel joists, the floor slabs, and the roof slab; all of which are laid perpendicular to the beams. In addition, diagonal steel rods with turnbuckles were placed between the columns of the outer ring on the second floor at regular intervals as tension bracing.⁹⁷ It is unknown whether or not the structural loading falls back to the central core of the structural system.



⁹⁵ Ali, 12, HABS IN-243. Appendix B.

⁹⁶ Boyce, 45.

⁹⁷ Ali, 10 paraphrased, HABS IN-243. Appendix B.

The second and third floor, and roof slabs were prefabricated. They were made of fiber-concrete with integral fiber-concrete covered open-web joists. There is additional steel reinforcing within the slabs that can be seen at various locations due to spalling; the spalling has been caused by extensive roof leaks. The size of the steel reinforcing and the type of construction of the slab, i.e. a two way flat slab system, a pre-cast concrete plank system, a prestressed system, is unknown.

The overall condition of the prefabricated slabs, and the integrated open-web joists is unknown, however it appears that they are in poor condition. The slabs and open-web joists appear to have severe damage in some areas due to water infiltration from roof leaks. A thorough inspection and load testing has not been completed.

2. All steel structural members, including the central tube, the tubular columns, the exposed beams, the diagonal bracing, and the third floor balustrade appear to be in fair condition. They have all been painted numerous times.

3. The exterior wood wall framing has only been partially inspected. The level of deterioration of the third floor framing is significant, with the studs having been exposed to severe water infiltration around the windows. In addition, the studs were not properly attached to a sill plate. Instead they were wedged between the existing original sill of the curtain wall system and the operable window above. The exterior wall framing on the first and second floors has not been inspected, however it appears to be in poor condition because the walls are flexible in many areas.

Insulation

The original insulation board for the first floor exterior walls was described as paper covered with bright aluminum foil.⁹⁸ However the existing insulation is not paper covered in foil but appears to be some type of composition board. Oral history states that the previous residents installed batt insulation on the first floor in 1961. The condition of the batt insulation is poor in those areas that have been inspected, including the study/recreation room. The condition of the batt insulation in all other areas is unknown.

Additions

1. The deterioration of the carport, circa 1938 – 1945, is effecting the integrity of the building. Its' overall condition is poor due to the fact that the previous residents did not maintain the roof. They did not remove tree debris, or make appropriate repairs, and they allowed the family pet to urinate and defecate on the roof. The carport is adjacent to the building at the east end of the living room/hanger area, and its roof is level with that of the second floor roof deck. Even though the structural system of the carport is not physically attached to the building the rotting roof joists abut it, and the flashing and roofing materials, approximately six layers of felt, do not completely bridge the gap between the carport and the building due to deterioration, allowing water to pass between the structures. The roofing felt is significantly deteriorated allowing water to pass through and causing a domino effect of deterioration, i.e. the decking material, the joists, the 4" x 6" beams, and the wood columns are all rotted. In addition, there are two steel tubular columns, located in the center of the carport, both of which have rusted out at the base. The level of deterioration of the wood members in the carport is accelerating the deterioration of the

⁹⁸ Graham. Appendix D, Exhibit A.

adjacent copper panels on the building, and the deterioration of the building's roof is accelerated because of the moisture that is being transmitted through the roofing felt.

2. The wood frame and screened enclosure, circa 1938 – 1945, was built on the second floor roof deck over the original garage and workshop. The roof of the enclosure is level with that of the third floor roof deck, with the existing felt roofing laid over the parapet between the enclosure's roof and the roof deck. The overall condition of the screened enclosure is poor due to the fact that the previous residents did not maintain the roof. They did not remove tree debris, or make appropriate repairs, and they allowed the family pet to urinate and defecate on the roof. The level of deterioration is effecting the structural integrity of the house by allowing a significant amount of water and moisture into the house. Large holes in the enclosure's roof allows water in causing the second floor roof deck beneath to deteriorate and leak. This leak is significant in that water enters the original garage and workshop areas on the first floor in cascades.

Exterior Envelope

Roofing

The original roofing material was a compressed asphalt board that was waterproof.⁹⁹ This material eventually failed, date unknown, due to its inability to withstand extended exposure to humidity, water, and snow. In 1987 the Maintenance Division of the national lakeshore, at the request of the previous residents, replaced the roof in an effort to make the house weathertight and protect it from further deterioration.¹⁰⁰ The replacement material was also a type of compressed asphalt board.

In late 1998 the Maintenance Division of the national lakeshore stabilized the roof in an effort to protect the house from further deterioration, with the exclusion of the roof under the screened enclosure on the second floor deck. The work included placing a layer of roofing felt over the existing material and hot mopping it with tar.¹⁰¹

1. The existing roofing material, installed in 1987 and stabilized in 1998, has substantially deteriorated. This deterioration, and the deterioration of previous roofs, resulted in severe leaks during the previous residents' occupation of the house. These leaks caused extensive damage to the structural system, the exterior wall framing, the window frames, and the exterior and interior finish materials. The existing roofing material, even though stabilized in 1998, is considered to be in poor condition.

2. The door thresholds, at the exterior door openings from the second and third floors onto the roof decks, have significantly deteriorated allowing water to enter the house causing interior and structural damage. In particular, the sill plate below the threshold of the second floor exterior kitchen door is beyond deterioration; it is barely being held together by L-brackets. The thresholds are in poor condition.

⁹⁹ Graham. Appendix D, Exhibit A.

¹⁰⁰ Maintenance Division files, Indiana Dunes National Lakeshore.

¹⁰¹ Maintenance Division files, Indiana Dunes National Lakeshore.

Gutters & Downspouts

There are no gutters and downspouts on the house, as it was originally designed without them.

Exterior Stairs and Deck Railing

1. The exterior stair stringers, and attached frames for the treads and risers, are steel. The original tread and riser base materials are unknown. It appears that there have been many replacements, as the existing materials include two by sixes and a type of compressed asphalt board. There are many missing stair treads and risers from the ground level to the second floor roof deck, and from the second to the third floor roof deck. The stringers and the remaining treads and risers are in poor condition.
2. The steel pipe handrails on the stairs, and that surround the roof decks, have steel pipe stanchions and steel base plates. The base plates are connected to the stringers and the parapet with bolts. All of the handrails have rusted due to a lack of general maintenance and are in poor condition.
3. There is a missing section of steel pipe handrail on the second floor roof deck due to the installation of the screened enclosure, circa 1938 – 1945.

Windows & Vents

To reiterate, Libbey-Owens-Ford was originally contracted with to supply the single-paned glass for the curtain wall system used on the second and third floors. Keck had been warned against the extensive use of glass by mechanical engineers who felt that the house couldn't be heated adequately.¹⁰² It should be noted that thermopane glass wasn't introduced by Libbey-Owens-Ford until 1935 or 1940.¹⁰³

As previously noted, the concept of sealed construction and use of large expanses of glass resulted in the ultimate failure of the air-conditioning system. So, it is logical to say that, after the house was moved to Beverly Shores in early 1935, Robert Bartlett removed the curtain wall system, and installed wood framed walls and operable windows, to provide sufficient natural air circulation.

In 1987 the Maintenance Division of the national lakeshore completed repairs on the existing windows on all levels of the house in an effort to make it weathertight and protect it from further deterioration. Repairs to the windows included scraping, painting, reglazing, recaulking, and making the windows operable.¹⁰⁴

1. The first floor steel frame windows have severely deteriorated due to a lack of general maintenance, and extensive moisture and water infiltration around the windows. The windows, which are glazed on the interior of the frame, are caked with caulk and paint, and are in poor condition. The wood framing surrounding the windows has deteriorated to the point that there are significant gaps in the framing and holes in the walls. The framing is in poor condition.

¹⁰² Storch.

¹⁰³ Butti & Perlin, 183.

¹⁰⁴ Maintenance Division files, Indiana Dunes National Lakeshore.

Existing Window Types – Original 1933

Type - Single-paned Steel Frame Rectangular Fixed Window (two lights) – Horizontal Orientation

Locations - Mechanical Room, Bedroom/Workshop

*Existing Window Types – Original 1933*

Type - Single-paned Steel Frame Rectangular Fixed Window (one light) – Vertical Orientation

Location - Entry



Existing Window Types - Circa Early 1935

Type - Single-paned Steel Frame Three-part Window – Central section fixed, outer sections casements with a small fixed light below the casement

Locations - Living Room/Hanger, Laundry Room/Hanger, Dining Room/Garage



2. The second and third floor steel frame windows, circa early 1935, have severely deteriorated due to a lack of general maintenance, and extensive moisture infiltration. The windows, which are glazed on the interior of the frame, are caked with caulk and paint, and are in poor condition. The wood framing surrounding the windows has deteriorated to the point that there are significant gaps in the framing and holes in the walls. The framing is in poor condition.

Existing Window Types - Circa Early 1935

Type - Single-paned Steel Frame Three-part Window – Central section fixed, outer sections casements with a small fixed light above and below the casement

Locations – Second and Third Floor - all rooms



3. The original steel-framed window, a horizontal single-paned rectangular fixed window with two lights, in the study/recreation room was destroyed in 1965 during a storm. It was replaced with a

wood-framed window similar to the three-part steel-framed window used in the living room/hanger. However, the existing window does not have casements; it is completely fixed. See oral history interview, Appendix D, Exhibit D. The window is in poor condition due to a lack of general maintenance, and moisture infiltration.



Exterior Doors

1. All of the original exterior doors were flush metal clad wood doors hung in metal frames. The only remaining original metal clad wood exterior door is located on the second floor, in the living room. It is in good condition. The previous resident replaced the first floor front door with a flush hollow core wood door. The 5 panel wood door from the first floor back hall into the carport and the 5 panel wood door from the third floor onto the roof deck are not original, dates unknown. They are in poor condition, having received damage from vandalism and forced entry. See the Interior Doors section of this report for the complete Door Schedule.

2. Garage door – See the *Structure* Exterior Wall section of this report.

3. Hanger door - See the *Structure* Exterior Wall section of this report.

Chimney

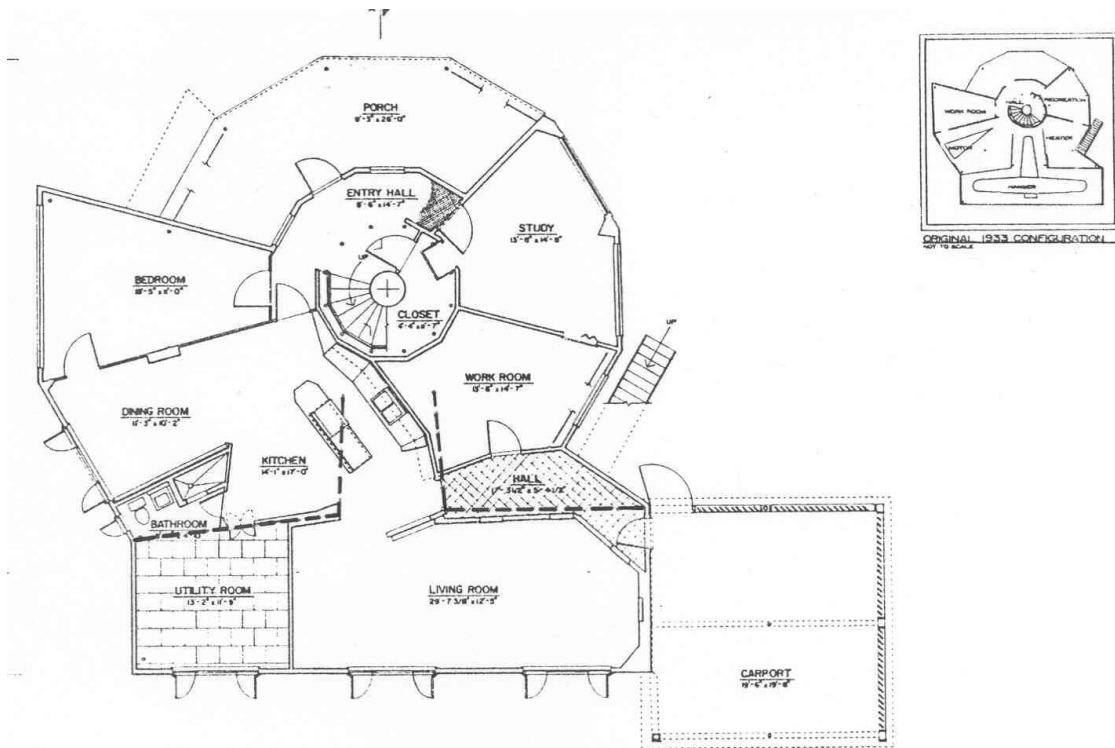
See the Fireplace section of this report.

Interior

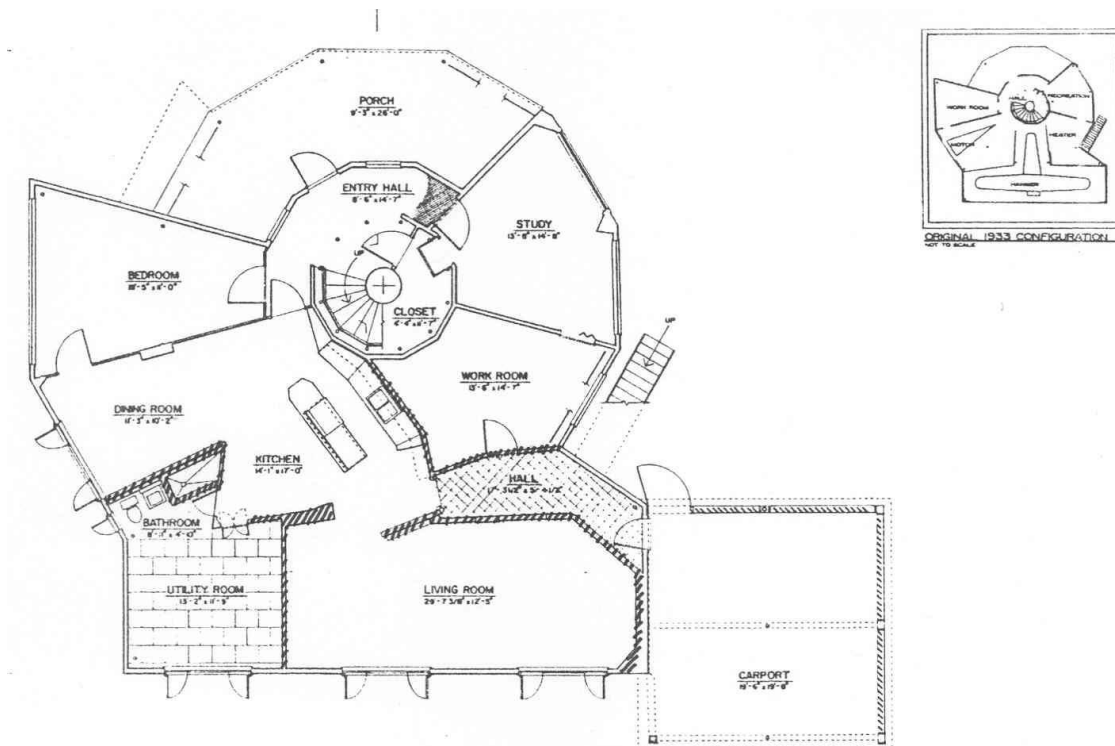
Partition Framing

1. The overall condition of the interior partition framing is unknown. It has not been inspected because it would require extensive removal of finish materials on the first and second floors of the house.

2. There were several original partitions on the first floor that were removed, date unknown.



3. There are several partitions that were added on the first floor that were not part of the original design.



Interior Stairs

The original interior stairs, from the first to the third floor, were constructed of steel stringers with steel tread and riser frames, and an aluminum handrail. It is thought that the original base material of the treads and risers is concrete, however this has not yet been verified. The original floor finish, a black rubber tile, still lies under the existing carpet. The stair appears to be in good condition because there is no deflection when weight is applied. A thorough inspection however has not been completed because it will require the removal of finish materials.

Wall Finishes

First Floor

1. The nonhistoric ceiling and historic and nonhistoric wall finish materials have deteriorated due to numerous roof leaks and interior moisture levels, and are in poor condition. Appendix D, Exhibit A states that the structural system was left exposed “notably in the central portion around the stair and in the solarium on the top floor.”. This Exhibit also noted that the ceiling, i.e. concrete slabs, in the workshop, recreation room, and the mechanical room, were left exposed. All of the walls were originally covered with plasterboard, except in the dining room/garage and the bedroom/workshop. Appendix D, Exhibit A, contains detailed information concerning finish materials.
2. The original paneling, a metal clad insulation board, in the dining room/garage and bedroom/workshop was covered with wood paneling by the residents, and the glass of the observation window between the rooms was painted. See oral history interview Appendix D, Exhibit D. There is little known about the paneling, including no information about the type/s of metals used in its manufacture, the construction detailing, or the installation procedures. The condition of the metal clad paneling, the window frame, and the glass is unknown.
3. The entry hall walls, finished with plasterboard that might be the original, were covered with oyster shells by the previous residents. The previous resident worked at a local restaurant from 1970 to 1980, and would bring home buckets of oysters for dinner. After the meal was completed, and the shells dried, the residents would then glue the shells to the walls. The application of the shells has resulted in severe damage to the plasterboard. The plasterboard is in poor condition. The original plasterboard ceiling in the entry hall was replaced by the residents with Masonite, yet they retained the original design and height. This material is in good condition.
4. The wood framed walls that surround the stairway were placed just beyond the tubular steel columns so that the columns, and the vertical ductwork between them, were left exposed. Historic photos found during research indicate that this was Keck’s original design intent.¹⁰⁵ Both the columns and the ductwork are in fair condition.

¹⁰⁵ Cultural Resource files, Indiana Dunes National Lakeshore, compilation of information on the World’s Fair Houses, 1983 – 1987.

First Floor Plan

Room No.	Current/Historic Room Names	Wall No.	Original Material	Orig. Material Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials
	First Floor				
101	Entry Hall	101-1	Plasterboard	possibly	1) Plasterboard 2) Oyster Shells
		101-2	Plasterboard	possibly	1) Plasterboard 2) Oyster Shells
		101-3	Plasterboard	possibly	1) Plasterboard 2) Oyster Shells
		101-4	Plasterboard	possibly	1) Plasterboard 2) Oyster Shells
		101-5	Plasterboard	possibly	1) Plasterboard 2) Oyster Shells
		101-6	Plasterboard	possibly	1) Plasterboard 2) Oyster Shells
		101-7	Plasterboard	possibly	1) Plasterboard 2) Oyster Shells
		101-8	Plasterboard	possibly	1) Plasterboard 2) Oyster Shells
		101-9	Plasterboard	possibly	1) Plasterboard 2) Oyster Shells
101a	Stairway	All	Plasterboard	possibly	1) Plasterboard
101b	Closet under Stair	101b-1	Plasterboard	no	1) Fiberboard
		101b-2	Plasterboard	no	1) Fiberboard
		101b-3	Plasterboard	no	1) Fiberboard
		101b-4	Plasterboard	no	1) Fiberboard
		101b-5	Plasterboard	no	1) Fiberboard
102	Study/Recreation Room – all original walls painted “dead white” to contrast bright blue ceiling and the “spectrum colors” of the ductwork	102-1	Plasterboard	no	1) Fiberboard 2) Fabric
		102-2	Plasterboard	no	1) Plywood
		102-3	Plasterboard	no	1) Plywood
		102-4	Plasterboard	no	1) Painted Paneling
		102-5	Plasterboard	no	1) Painted Paneling

103	Mechanical Room – all original walls painted with aluminum paint to contrast primary colors of the ductwork	103-1	Plasterboard	no	1) Peg Board
		103-2	Plasterboard	no	1) Fiberboard
		103-3	N.A.	N.A.	1) Pressed Board
		103-4	N.A.	N.A.	1) Open studs
		103-5	N.A.	N.A.	1) Peg Board
		103-6	N.A.	N.A.	1) Peg Board
		103-7	Plasterboard	no	1) Peg Board
		103-8	Plasterboard	no	1) Peg Board
		103-9	Plasterboard	no	1) Peg Board
104	Back Hall/ Mechanical Room	104-1	N.A.	N.A.	1) Painted Paneling
		104-2	Plasterboard	no	1) Painted Paneling
		104-3	Plasterboard	no	1) Painted Paneling
		104-4	N.A.	N.A.	1) Painted Paneling
		104-5	Plasterboard	no	1) Painted Paneling
		104-6	N.A.	N.A.	1) Painted Paneling
		104-7	N.A.	N.A.	1) Painted Paneling
105	Living Room/ Airplane Hangar/	105-1	N.A.	N.A.	1) Painted Concrete Block
		105-2	Plasterboard	no	1) Painted Paneling
		105-3	N.A.	N.A.	1) Painted Paneling
		105-4	Plasterboard	no	1) Painted Paneling 2) Silk
		105-5	Plasterboard	no	1) Plywood 2) Silk
		105-6	N.A.	N.A.	1) Plasterboard
		105-7	N.A.	N.A.	1) Plasterboard
106	Laundry/Airplane Hangar	106-1	N.A.	N.A.	1) Pressed Board
		106-2	N.A.	N.A.	1) Plasterboard
		106-3	Plasterboard	no	1) Plywood
		106-4	Plasterboard	possibly	1) Plasterboard
107	¾ Bathroom/Garage	107-1	Plasterboard	?	1) ? 2) Ceramic Tile
		107-2	N.A.	N.A.	1) ? 2) Ceramic Tile
		107-3	N.A.	N.A.	1) ? 2) Ceramic Tile & Pressed Board

108	Kitchen/Airplane Hangar	108-1	N.A.	N.A.	1) Plasterboard
		108-2	N.A.	N.A.	1) Painted Vertical Boards
		108-3	Plasterboard	no	1) Pressed Board
		108-4	Plasterboard	no	1) Pressed Board
		108-5	N.A.	N.A.	1) Pressed Board
		108-6	N.A.	N.A.	1) Pressed Board
109	Dining Room/ Garage	109-1	N.A.	N.A.	1) Plasterboard 2) Painted Concrete Block
		109-2	Plasterboard	no	1) Painted Vertical Boards
		109-3	Metal covered insulation board	yes	1) Metal covered insulation board 2) Painted Vertical Boards
110	Bedroom/ Workshop – all original walls painted with aluminum paint to contrast the orange floor	110-1	Metal covered insulation board	yes	1) Metal covered insulation board
		110-2	Metal covered insulation board	?	1) ? 2) Carpet
		110-3	Metal covered insulation board	yes	1) Metal covered insulation board 2) Painted Paneling
		110-4	Metal covered insulation board	yes	1) Metal covered insulation board

Second Floor

1. The historic and nonhistoric ceiling and wall finish materials have deteriorated due to numerous roof leaks and interior moisture levels, and are in poor condition. Appendix D, Exhibit A states that the structural system was left exposed, “notably in the central portion around the stair and in the solarium on the top floor.”
2. One piece of the original polished black Carrara glass is missing in the living room, having been broken during a game of billiards, and numerous pieces of the original polished white Carrara in the bathroom are cracked or broken. The unbroken glass in both rooms is in good condition. The polished pale gray Carrara in the dining room is in good condition and will not require repair or replacement. All of the Carrara glass had been attached to the substrate material using mastic.
3. The wood framed walls that surround the stairway were placed just beyond the tubular steel columns so that the columns, and the vertical ductwork between them, were left exposed.

Historic photos found during research indicate that this was Keck's original design intent.¹⁰⁶ Both the columns and the ductwork are in fair condition.

4. The original drop ceiling of wood frame and plasterboard was removed in the 1960's in all rooms on the second floor except the Master Bedroom and portions of the Kitchen. It had been severely damaged due to extensive roof leaks. See oral history interview in Appendix D, Exhibit D. The ceiling in the Master Bedroom is in good condition, having received only a slight amount of water damage from roof leaks, and the ceiling in the Kitchen is in poor condition. The drop ceiling in all rooms on the second floor included a recessed cove adjacent to the curtain wall system. This was designed to accommodate the Venetian blinds and the roller shades as specified by Keck. The shear drapes were hung from a track attached directly to the ceiling adjacent to the cove.

¹⁰⁶ Cultural Resources files, Indiana Dunes National Lakeshore, compilation of information on the World's Fair Houses, 1983 – 1987.

Room No.	Current/Historic Room Names	Wall No.	Original Material	Orig. Material Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials
	Second Floor				
201	Master Bedroom	201-1	Plasterboard	no	1) Drywall 2) Burlap 3) Fabric
		201-2	End-grain Pine Blocks	yes	1) End-grain Pine Blocks
		201-3	End-grain Pine Blocks	yes	1) End-grain Pine Blocks
		201-4	Plasterboard	possibly	1) Plasterboard
		201-5	Plasterboard	possibly	1) Plasterboard
		201-6	Plasterboard	possibly	1) Plasterboard
202	Bathroom	202-1	White Carrara Glass	yes	1) White Carrara Glass
		202-2	White Carrara Glass	yes	1) White Carrara Glass
		202-3	Plasterboard	possibly	1) Plasterboard
		202-4	White Carrara Glass	yes	1) White Carrara Glass
203	Children's Bedroom	203-1	Plasterboard	possibly	1) Plasterboard
		203-2	Plasterboard	no	1) Drywall 2) Carpet
		203-3	Plasterboard	no	1) Drywall 2) Carpet
		203-4	Plasterboard	possibly	1) Plasterboard
		203-5	Plasterboard	possibly	1) Plasterboard
		203-6	Plasterboard	possibly	1) Plasterboard
204	Kitchen	204-1	Plasterboard	possibly	1) Plasterboard
		204-2	Plasterboard	possibly	1) Plasterboard
		204-3	Plasterboard	possibly	1) Plasterboard
		204-4	Plasterboard	possibly	1) Plasterboard
		204-5	Plasterboard	possibly	1) Plasterboard 2) Ceramic Tile
205	Dining & Living Room	205-1	Gray Carrara Glass	yes	1) Gray Carrara Glass
		205-2	Plasterboard	possibly	1) Plasterboard 2) Carpet
		205-3	Plasterboard	possibly	1) Plasterboard 2) Carpet
		205-4	Plasterboard	possibly	1) Plasterboard 2) Carpet
		205-5	Plasterboard	possibly	1) Plasterboard 2) Carpet

		205-6	Plasterboard	possibly	1) Plasterboard 2) Carpet
		205-7	Plasterboard	yes	1) Plasterboard 2) Fabric
		205-8	Black Carrara Glass	no	1) Black Carrara Glass
		205-9	Black Carrara Glass	yes	1) Black Carrara Glass
		205-10	Black Carrara Glass	yes	1) Black Carrara Glass

Third Floor

The nonhistoric wall finish materials have deteriorated due to numerous water leaks and interior moisture levels, and are in poor condition. Appendix D, Exhibit A states that the structural system was left exposed, “notably in the central portion around the stair and in the solarium on the top floor.”

Room No.	Current/Historic Room Names	Wall No.	Original Material	Orig. Material Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials
	Third Floor				
301	Sunroom/Solarium	301-1	Plasterboard	no	1) Paneling 2) Carpet
		301-2	Plasterboard	no	1) Paneling 2) Carpet
		301-3	Plasterboard	no	1) Paneling 2) Carpet
		301-4	Plasterboard	no	1) Paneling 2) Carpet
		301-5	Plasterboard	no	1) Paneling 2) Carpet
		301-6	Plasterboard	no	1) Paneling 2) Carpet
		301-7	Plasterboard	no	1) Paneling 2) Carpet
		301-8	Plasterboard	no	1) Paneling 2) Carpet
		301-9	Plasterboard	no	1) Paneling 2) Carpet
		301-10	Plasterboard	no	1) Paneling 2) Carpet
		301-11	Plasterboard	no	1) Paneling 2) Carpet
		301-12	Plasterboard	no	1) Paneling 2) Carpet

Floor Finishes

First Floor

There is at least one layer of carpet over the rubber tile and painted concrete floors in most areas of the first floor. The condition of the rubber tile is unknown. See oral history interview Appendix D, Exhibit D. The original historic flooring materials are noted in Appendix D, Exhibit A, “the floors are of rubber tile, end-grain block wood, wood and concrete, each flooring material used where it serves its purpose best.”

Room No.	Current/Historic Room Names	Original Material	Orig. Material Still in Existence	Existing Base Material / Intermediate Material / Top Material
	First Floor			
100	Front Porch	?	?	1) Painted Concrete – Red 2) Painted Concrete – Gray
101	Entry Hall	?	?	1) Black Rubber Tile (?) 2) Ceramic Tile
101a	Stairway	Black Rubber Tile	yes	1) Black Rubber Tile 2) Carpet
101b	Closet under Stair	?	?	1) Unpainted Concrete
102	Study/Recreation Room	Bright Blue Rubber Tile	no	1) Bare Concrete 2) Carpet
103	Mechanical Room	Painted Concrete – Red-Orange	yes	1) Painted Concrete – Red-Orange
104	Back Hall /Mechanical Room	Painted Concrete – Red-Orange	possibly	1) ? 2) Ceramic Tile
105	Living Room/ Airplane Hangar	?	?	1) Bare Concrete 2) 6” x 6” Rubber Tile (not extant) 3) Carpet 4) Carpet
106	Laundry/Airplane Hangar	?	?	1) Splatter Painted Black Rubber Tile
107	¾ Bathroom/Garage	?	?	1) ? 2) Ceramic Tile
108	Kitchen/Airplane Hangar	?	?	1) Red Rubber Tile 2) Carpet 3) Carpet
109	Dining Room/ Garage	?	?	1) Painted Concrete 2) Carpet 3) Carpet
110	Bedroom/ Workshop	Painted Concrete – Orange	?	1) ? 2) +/- 18” x 24” Black Rubber Tile 3) Carpet

Second Floor

There is one layer of carpet over the original parquet and rubber tile. The condition of the rubber tile is unknown. The original parquet in the living and dining rooms has been severely damaged by water, and is considered to be in poor condition. Approximately fifteen percent has been replaced with plywood and particleboard. The parquet in the master bedroom has only slight damage resulting from typical use, and is considered to be in good condition. See oral history interview Appendix D, Exhibit D. The historic flooring materials are noted in Appendix D, Exhibit A, “the floors are of rubber tile, end-grain block wood, wood and concrete, each flooring material used where it serves its purpose best.”

Room No.	Current/Historic Room Names	Original Material	Orig. Material Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials
	Second Floor			
201	Master Bedroom	End-grain Pine Blocks	yes	1) End-grain Pine Blocks
202	Bathroom	Pink Rubber Tile	yes	1) Pink Rubber Tile 2) Black Rubber Tile 3) Carpet
203	Children’s Bedroom	Turquoise Rubber Tile	yes	1) Turquoise Rubber Tile 2) Carpet
204	Kitchen	Brown Rubber Tile	yes	1) Brown Rubber Tile 2) Black & White Rubber Tile 3) Carpet
205	Dining & Living Room	End-grain Walnut Blocks	yes	1) End-grain Walnut Blocks 2) Carpet

Third Floor

There is one layer of carpet over particleboard over the original rubber tile. The overall condition of the rubber tile is unknown. See oral history interview Appendix D, Exhibit D. The historic flooring materials are noted in Appendix D, Exhibit A, “the floors are of rubber tile, end-grain block wood, wood and concrete, each flooring material used where it serves its purpose best.”

Room No.	Current/Historic Room Names	Original Material	Orig. Material Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials
	Third Floor			
301	Sunroom/Solarium	Black & White Rubber Tile	yes	1) Black & White Rubber Tile 2) Particle Board 3) Carpet

Interior Doors

All of the original interior doors were flush metal clad wood doors hung in metal frames, with the exception of the first floor entry hall closet.

1. First Floor - All of the original doors have been replaced. See the complete Door Schedule for detailed information.
2. First Floor - The door currently on the entry closet is an original metal panel door, in good condition, however it does not belong on the closet. As noted in Appendix D, Exhibit A, the original door was “a collapsible door that folds toward the side jamb thus occupying little room when open.” (Please refer to the historic interior photos of the Wieboldt-Rostone House where an accordion door was also used for the entry hall closet.) The existing door matches the design of the original metal paneling used in the workshop, and could possibly be from that room.

Room No.	Current/Historic Room Names	Door No.	Original Door Type	Orig. Door Type Still in Existence	Existing Door Type
	First Floor				
101	Entry Hall	101a	Metal Clad Wood – Flush Surface	no	Wood Hollow Core – Flush Surface
101b	Closet under Stair	101b	Heavy Fabric Accordion Door	no	Metal Panel Door Flush Surface (Possibly an original from the Workshop, matches the design of the original metal paneling.)
102	Study/Recreation Room	102a	Metal Clad Wood – Flush Surface	no	Wood Hollow Core – Flush Surface
		102b	Metal Clad Wood – Flush Surface	no	Wood Hollow Core Bi-fold – Flush Surface
103	Mechanical Room	103a	N.A.	N.A.	Solid Wood – 2 Vertical Panels over 3 Horizontal Panels
104	Back Hall /Mechanical Room	104a	N.A.	N.A.	Solid Wood – 5 Horizontal Panels
106	Laundry/Airplane Hangar	106a	N.A.	N.A.	Solid Wood – Louvered Saloon Door
108	Kitchen/Airplane Hangar	108a	Metal Clad Wood – Flush Surface	no	Wood Hollow Core – Flush Surface
110	Bedroom/ Workshop	110a	Metal Clad Wood – Flush Surface (or Metal Panel Door Flush Surface?)	no	Wood Hollow Core – Flush Surface
		110b	Metal Clad Wood – Flush Surface (or Metal Panel Door Flush Surface?)	no	Wood Hollow Core – Flush Surface

3. Second Floor – All of the original doors have been replaced. See the complete Door Schedule for detailed information.

Room No.	Current/Historic Room Names	Door No.	Original Door Type	Orig. Door Type Still in Existence	Existing Door Type
	Second Floor				
201	Master Bedroom	201a	Metal Clad Wood – Flush Surface	no	Solid Wood – 2 Panels (it is not hanging)
202	Bathroom	202a	Metal Clad Wood – Flush Surface	no	Solid Wood – 2 Panels
203	Children’s Bedroom	203a	Metal Clad Wood – Flush Surface	no	No Existing Door
		203b	Metal Clad Wood – Flush Surface	no	No Existing Door
204	Kitchen	204a	Metal Clad Wood – Flush Surface	no	Solid Wood – Flush Panel
		204b	Metal Clad Wood – Flush Surface	no	No Existing Door
205	Dining & Living Room	205a	Metal Clad Wood – Flush Surface	yes	Metal Clad Wood – Flush Surface

Cabinets/Built-in Furniture

1. The first floor kitchen cabinets, installed in 1969, are pulling away from the walls, and are in poor condition.
2. There are four closets that have been added on the first floor that were not part of the original design, most dates of installation are unknown. Two are located in the bedroom/workshop (1988 or 1990), one in the laundry room/hanger, and one in the study/recreation room. The closet in the study was built into the closet under the stairs within the central core. All of the closets are in poor condition.
3. A closet was added in the children’s bedroom on the second floor that was not part of the original design, date unknown. It is in poor condition.
4. Most of the original enameled metal kitchen cabinets on the second floor are still in place. The doors are flush with the cabinet frames, and have chrome handles. See Appendix D, Exhibit A. The cabinets, originally finished in a sand color, have been painted repeatedly, and are in fair condition.

Fireplace

Keck had not included any type of fireplace in his original design for the house. The existing gas log fireplace on the second floor, and the prefabricated metal chimney, were added in 1966 by the previous residents. The fireplace and chimney are in poor condition.

Plumbing Systems**Water Supply**

The house is currently serviced by a well located adjacent to Lake Front Drive. The condition of the well, and the equipment types are unknown. The existing interior water distribution system is comprised of galvanized steel, copper, and PVC piping. It has not been inspected for safety or code compliance; its condition is unknown.

Sanitary Sewer System

The house is currently serviced by a septic tank. The location/s, condition, and equipment types (i.e. lift stations) are unknown. The previous resident did state during the oral history interview that there might be several septic tanks and drain fields on site.

Plumbing & Fixtures

1. The first floor $\frac{3}{4}$ bathroom was not part of the original design, date unknown. The fixtures, including a toilet and pedestal sink, are ceramic. The base of the shower stall is concrete, and the walls are finished with ceramic tile. The plumbing will require inspection and possible repair and/or replacement. The plumbing was conventional for the time period of construction, and does not meet current building codes. It is in poor condition.
2. The second floor bathroom includes a ceramic toilet and sink, with the sink supported by chrome legs at the front, and an enameled cast iron tub. The tub is partially enclosed with plate glass for use as a shower stall. The plumbing in the second floor's kitchen and bathroom will require inspection and possible repair and/or replacement. The plumbing was conventional for the time period of construction, and does not meet current building codes. It is in poor condition.

Heating and Air-conditioning Systems

To reiterate, Keck chose to design the house around the newly devised, water-cooled, air-conditioning system.¹⁰⁷ It was assumed at that time that all buildings, both commercial and private homes, would have air-conditioning, and that it would “be considered as necessary as central-heating and bathrooms are . . .”¹⁰⁸

It was thought that an air-conditioning system would be more efficient when it was operated within a closed space, “. . . when its balance of air output and intake is not disturbed, as by open windows and doors.”¹⁰⁹ So, with the flexibility from using a steel structural system, a central air-conditioning system, and glass that was obtainable in much larger sizes, it was possible for Keck to eliminate the “inefficiencies” of operable windows within his design¹¹⁰, and instead utilize a fixed single-paned glass curtain wall system.

¹⁰⁷ Graham. Appendix D, Exhibit A.

¹⁰⁸ Graham. Appendix D, Exhibit A.

¹⁰⁹ Graham. Appendix D, Exhibit A.

¹¹⁰ Graham. Appendix D, Exhibit A.

Keck had been warned against the extensive use of glass by mechanical engineers who felt that the house couldn't be heated adequately.¹¹¹ It should be noted that thermopane glass wasn't introduced by Libbey-Owens-Ford until 1935 or 1940.¹¹²

The concept of sealed construction and use of large expanses of glass resulted in the ultimate failure of the air-conditioning system. It was found during research that the air-conditioning could not handle the significant heat gain from the sun's radiation during the Exposition resulting in the closure of the second floor's master bedroom to visitation.^{113 114 115} To resolve the problem, when the house was moved to Beverly Shores in early 1935 Robert Bartlett removed the curtain wall system, and installed wood framed walls and operable windows to provide sufficient natural air circulation.

1. The original forced air heating system, with ductwork, was replaced with a boiler and baseboard heating system in 1962. The original ductwork, part of which is still in place, was an essential visual element in the design of the first floor, having been left exposed and painted to accent the colors chosen for each room. The materials used to fabricate the ductwork, and current condition of the ductwork, are unknown. The existing boiler is in fair condition, and the baseboard units are in poor condition. See Appendix D, Exhibit A.

2. The original water-cooled air-conditioner was removed from the building, date unknown, and was never replaced.

Electrical Systems

Power Supply & Distribution

1. The original aerial electrical service comes into the structure on the south, or rear, elevation of the house. It was conventional for the time period of construction. The condition of the service is unknown.

2. The electrical wiring and distribution panel were conventional for the time period of construction, and do not meet current building codes. They are in poor condition.

Electrical Fixtures and Devices

1. It is important to note that the lighting was an important element in the design of the house. Keck utilized fixed lighting in the first floor's recreation room, and the second floor's dining room and kitchen, and the central stair, while using portable fixtures of his own design in all other spaces.

2. The original indirect lighting system in the central stair, still in existence, was a vital element in the design of the house. It has not been inspected for operation or safety, and so the condition is unknown.

¹¹¹ Storch.

¹¹² Butti & Perlin, 183.

¹¹³ Interview with Maria Ali, 1994.

¹¹⁴ Jandl, 134.

¹¹⁵ Blum, 56.

3. The other existing light fixtures, date unknown and not original to the house, are in poor condition due to their age and lack of maintenance.
4. There are no exterior light fixtures on the house or on site.

Kitchen Appliances

1. The original dishwasher, still in existence, was finished in a sand color, but has been painted repeatedly. It is not currently operable and is in poor condition, however the original interior dish baskets are still in place.
2. The other appliances, including the refrigerator and stove in the second floor kitchen and the refrigerator in the first floor recreation room, were removed after the closing of the Exposition in 1934. Photographs of the appliances do exist; see Appendix D, Exhibits A and B.

Furnishings

1. There is substantial documentation on the furnishings used at the Century of Progress Exposition. See Appendix D, Exhibit A. The last resident of the house, prior to the expiration of the Special Use Permit in 1998, furnished the house with eclectic pieces. Freestanding furniture is considered a personal possession, so when the SUP expired the residents removed it. The house currently stands empty.
2. The original second floor bathroom mirror was removed and replaced by the existing medicine cabinet and mirror. The national lakeshore is in possession of the original mirror, which is in good condition, and it can be reinstalled.

Accessibility

At present, the first floor of the house is only partially accessible. The path to the back door at the carport is relatively level and can be utilized with some assistance. However, the threshold design at this exterior door, and the width of this door and all of the interior doors on the first floor are not sufficient for the unimpeded passage of a wheelchair. The second and third floors of the house are not accessible due to the lack of an elevator. The handicap accessibility assessment is based upon conditions set forth in *the Uniform Federal Accessibility Standards*, 1985 edition, adopted by the National Park Service.

Life Safety

The house was not designed as a private residence, however since it was originally designed as an exhibit building for the 1933 Century of Progress Exposition, with hundred's of visitors on a daily basis, it does provide the opportunity for safe and expedient egress in case of fire. The house has two openings leading to the exterior on the first floor, the back door on the east end of the house, and the front door on the north side of the house. There are also two exterior doors from the second floor onto the roof deck, one on the west side and one on the south side, and one door from the third floor onto the roof deck. There are exterior stairs leading from the roof decks to the exterior of the first floor. It is required under the licensing agreement with HLFII that residents maintain fire extinguishers in the house. The assessment is based upon conditions set forth in the Uniform Building Code, which is utilized by the National Park Service.

ALTERNATIVE TREATMENTS

Alternative #1 Rehabilitation

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.¹¹⁶

Because the following points can be made about the House of Tomorrow:

- ◆ that the house has retained its most dominant architectural details, i.e. its distinct massing and rectilinear lines;
- ◆ that the configuration of the floor plan and room relationships on the second and third floors have not been altered;
- ◆ and that the house has retained many of the architect's original details, i.e. metal clad doors, enameled kitchen cabinets, and Carrara glass wall finishes;

Rehabilitation, as defined by the Secretary of the Interior, is a viable alternative for the treatment of the House of Tomorrow for the following reasons:

- ◆ the integrity of the house has been severely compromised by the significant alterations made to the structure by several residents, most notably the alterations to the first floor plan configuration;
- ◆ the integrity of the house has been severely compromised by the numerous attempts at redecorating the interior, which included removal of many of the original interior finishes;
- ◆ the integrity of the house has been severely compromised by the lack of general maintenance and neglect by the previous residents, resulting in a severe level of deterioration of the exterior walls and interior due to significant water and moisture infiltration;
- ◆ the proposed first floor plan configuration has been designed in the spirit of Keck's original design;
- ◆ and rehabilitation would provide continuity within the Century of Progress Architectural District, as a rehabilitation project is in progress on the Florida Tropical House, and rehabilitation has been recommended for the Wieboldt-Rostone House and the Cypress Log Cabin.

Alternative #2 Preservation

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new

¹¹⁶ Kay D. Weeks and Anne E. Grimmer, *The Secretary of the Interior's Standards for the Treatment of Historic Properties*, (U.S. Department of the Interior, National Park Service, Cultural Resource Stewardship and Partnerships, Heritage Preservation Services, Washington, D.C., 1995), 61.

construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.¹¹⁷

Even though the following points can be made about the House of Tomorrow:

- ◆ that the house has retained its most dominant architectural details, i.e. its distinct massing and rectilinear lines;
- ◆ that the configuration of the floor plan and room relationships on the second and third floors have not been altered;
- ◆ and that the house has retained many of the architect's original details, i.e. metal clad doors, enameled kitchen cabinets, and Carrara glass wall finishes;

Preservation, as defined by the Secretary of the Interior, is not recommended for the following reasons:

- ◆ the integrity of the house has been severely compromised by the significant alterations made to the structure by several residents, most notably the alterations to the first floor plan configuration;
- ◆ the integrity of the house has been severely compromised by the numerous attempts at redecorating the interior, which included removal of many of the original interior finishes;
- ◆ and the integrity of the house has been severely compromised by the lack of general maintenance and neglect by the previous residents, resulting in a severe level of deterioration of the exterior walls and interior due to significant water and moisture infiltration.

Alternative #3 Restoration

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.¹¹⁸

Even though the following points can be made about the House of Tomorrow:

- ◆ that it has retained its most dominant architectural details: its distinct massing and rectilinear lines;
- ◆ that the configuration of the floor plan and room relationships on the second and third floors have not been altered;
- ◆ and that the house has retained many of the architect's original details, i.e. metal clad doors, enameled kitchen cabinets, and Carrara glass wall finishes;

¹¹⁷ Weeks and Grimmer, 17.

¹¹⁸ Weeks and Grimmer, 117.

Restoration, as defined by the Secretary of the Interior, of the house to its period of significance would be difficult, if not impossible, for the following reasons:

- ◆ the house was moved from its original location, at the Exposition site in Chicago, to Beverly Shores and has lost its original context;
- ◆ the period of significance as originally noted in the National Register nomination was 1933 – 1934, however it has been determined during the writing of this report that the period of significance is actually 1933 – 1947 due to the significance of the Century of Progress houses to the development of Beverly Shores, Indiana. Major alterations were made to the house during the period of significance, with little or no oral or written evidence of the exact type/s and date/s of the alterations, making it difficult to choose what elements would need to be retained and what elements should be removed. See the Evaluation of Character Defining Features section of this report for detailed information;
- ◆ when the house was moved to its current location, the site chosen was not comparable to the original in Chicago. The original sloping site at the Exposition was chosen to accommodate the interior height of the airplane hanger. The hanger was four feet deeper than the surrounding first floor to accommodate the height of the airplane. The current site is relatively level which did not allow for the exact reconstruction of the first floor;
- ◆ the integrity of the house has been severely compromised by the significant alterations made to the structure by several residents, most notably alterations to the first floor plan configuration;
- ◆ the integrity of the house has been severely compromised by the numerous attempts at redecorating the interior, which included removal of many of the original interior finishes;
- ◆ and the integrity of the house has been severely compromised by the lack of general maintenance and neglect by the previous residents, resulting in a severe level of deterioration of the exterior walls and interior due to significant water and moisture infiltration.

Supporting Data

The national lakeshore's 1980 General Management Plan (GMP) addressed each of the Century of Progress houses separately. For the House of Tomorrow it stated, "The house was intended to be the inspiration for new and innovative architecture. Of all the World's Fair houses, this one employs the most radical use of space and materials."¹¹⁹ The national lakeshore chose, at that time, to relocate the house outside the active beach zone. The plans also included restoring the house to its 1933-34 appearance, and acquiring the original furnishings for interpretive purposes, however, funding for this project was not obtained.

In 1993 the Historic Landmarks Foundation of Indiana (HLFI) placed the Century of Progress houses on the List of Ten Most Endangered Sites in the State of Indiana, and contacted the national lakeshore to discuss the long term plans for the houses and how they might assist in their preservation. The national lakeshore entered into a Memorandum of Understanding (MOU) with HLFI in June, 1996, with the intent that the Florida Tropical House, and any additional

¹¹⁹ General Management Plan, Indiana Dunes National Lakeshore (National Park Service, Department of the Interior, February 1980), 21-22.

houses as may be agreed to, be protected and maintained under the auspices of a residential leasing program. The Florida Tropical House was leased to HLFi for a period of 20 years, and in turn HLFi was responsible for recruiting potential lessees. The lessees would be responsible for completing the recommended treatment within the first 3 years of the lease following the Secretary of the Interior's Standards.

The 1997 GMP, a compilation of management plans covering three distinct areas of the national lakeshore, was completed in August of that year. The stance taken by the national lakeshore at that time was that long-term leases would be sought for each house under the auspices of a residential leasing program, requiring strict maintenance of the structures and occasional tours.¹²⁰

The national lakeshore's 1997 Interpretive Plan briefly refers to the interpretation of the houses through a wayside exhibit. Funding for this was requested in 2001 through the Project Management Information System (PMIS), package number 22021.

From 1996 through 2000, HLFi has been actively recruiting potential lessees for the Century of Progress houses, with support from the Cultural Resource staff of the national lakeshore. There have been multiple stumbling blocks to this process, including the limited time period of the leases, the cost of the projects, the lack of financial incentive in the way of federal or state tax credits, and the fact that the Town of Beverly Shores has an ordinance restricting the use of buildings within the town limits to single family residences. The last of which was ultimately found not to be applicable to this project because the Century of Progress houses fall within a grandfather clause, i.e. construction date, of the ordinance. In response to these points several amendments to the original MOU have been written.

In October, 1997, an amendment was written specifying the inclusion of the Wieboldt-Rostone House, the House of Tomorrow, and the Cypress Log Cabin in the leasing program. July, 1998, brought a second amendment to the MOU which extended the lease of the houses to HLFi from 20 to 25 years. In January, 2000, HLFi's lease was again extended to 35 years, with a period of 30 years set for the individual lessees. In November, 2000, in response to a request from several potential lessees and HLFi, concerning the Federal Tax Incentive Program for historic preservation, an amendment was written that allows the lessees to sublet a house. The national lakeshore agreed to this with the understanding that it would be on a limited basis.

Recommendation

In consideration of the condition of the House of Tomorrow, the national lakeshore recommends Alternative #1 Rehabilitation as the preferred method of treatment within the guidelines set forth by the Secretary of the Interior. While this alternative maintains the architect's original details still in existence, i.e. metal clad doors, the enameled kitchen cabinets, the Carrara glass wall finishes, and the unique structural system, it also provides for the restoration of the exterior appearance of the house, (i.e. the glass curtain wall system on the second and third floors, and the overhead hangar and garage doors), and the adaptive rehabilitation of the first floor as both service and living space.

¹²⁰ General Management Plan, Indiana Dunes National Lakeshore (National Park Service, Department of the Interior, August 1997), 34.

PROPOSED REHABILITATION OF FIRST FLOOR PLAN

Alternative #1 (Preferred):

Description:

The proposed first floor plan was inspired by Keck's original design, with the spaces radiating from the central core of the building.

Analysis:

- ◆ This design allows for use of the first floor as both living and service areas, respectful of Keck's original design.
- ◆ It minimizes the modifications to the first floor, focusing on the areas originally used as the mechanical room and hangar, with only a slight change to the original garage.
- ◆ There are a minimum number of new walls required to achieve the spaces desired, and they radiate from the center of the plan.
- ◆ It allows for the maximum amount of exterior wall to be restored to the original appearance.
- ◆ It allows for the maximum amount of exterior wall and windows to be open to the landscape.

Special Construction Requirements:

- ◆ It will require the design and construction of two overhead doors to be installed in the original locations of the garage and hangar doors. The door in the garage area will be completely inoperable allowing for use of the space as a bedroom. The door in the hangar will be approximately 1/3 inoperable and 2/3 operable, allowing for the western 1/3 of the space to be used as a bedroom and the eastern 2/3 to be used as a 2-car garage.
- ◆ It will require the relocation of the plumbing, with special emphasis placed on locating vent stacks.

Alternative #2:**Description:**

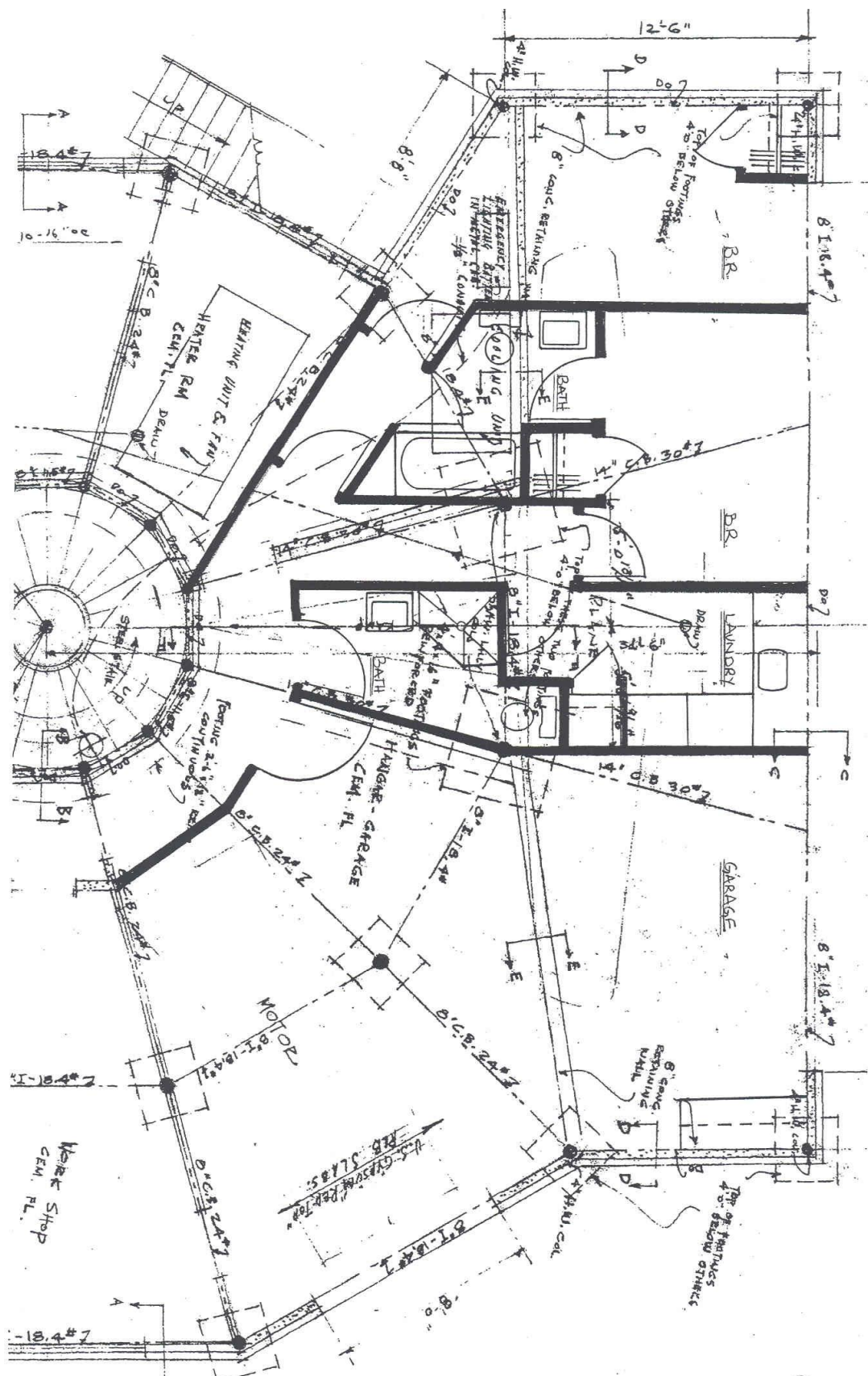
The central portion of the proposed plan, i.e. the $\frac{3}{4}$ bath and laundry, might have been inspired by Keck's original design with one wall radiating from the central core of the building, however the remainder of the plan is merely a division of larger spaces into usable areas with no respect to Keck's original design intent.

Analysis:

- ◆ This design allows for the use of the first floor as both living and service areas.
- ◆ It proposes the restoration of the garage to its original location, and the use of the western $\frac{1}{3}$ of the hangar as garage. This option does not take into consideration that the turning radius is too tight to enter the original garage, and the use of the western half of the hangar will not only require the removal of an extensive amount of vegetation near the road, but they would also be driving over one of the existing drain fields.
- ◆ Instead of having just one partition wall abutting the hangar door, there will be three that will require camouflage.
- ◆ Some of the plumbing is centrally located causing the vent stacks to be located in the middle of the roof deck above.
- ◆ The plan does not take into consideration the locations of the walls above on the second floor.
- ◆ The $\frac{3}{4}$ bathroom is far too small and cramped.

Special Construction Requirements:

- ◆ It will require the design and construction of two overhead doors to be installed in the original locations of the garage and hangar doors. The door in the garage area will be completely inoperable allowing for use of the space as a bedroom. The door in the hangar will be approximately $\frac{1}{3}$ inoperable and $\frac{2}{3}$ operable, allowing for the western $\frac{1}{3}$ of the space to be used as a bedroom and the eastern $\frac{2}{3}$ to be used as a 2-car garage.
- ◆ It will require the relocation of the plumbing, with special emphasis placed on locating vent stacks.



Alternative #3:**Description:**

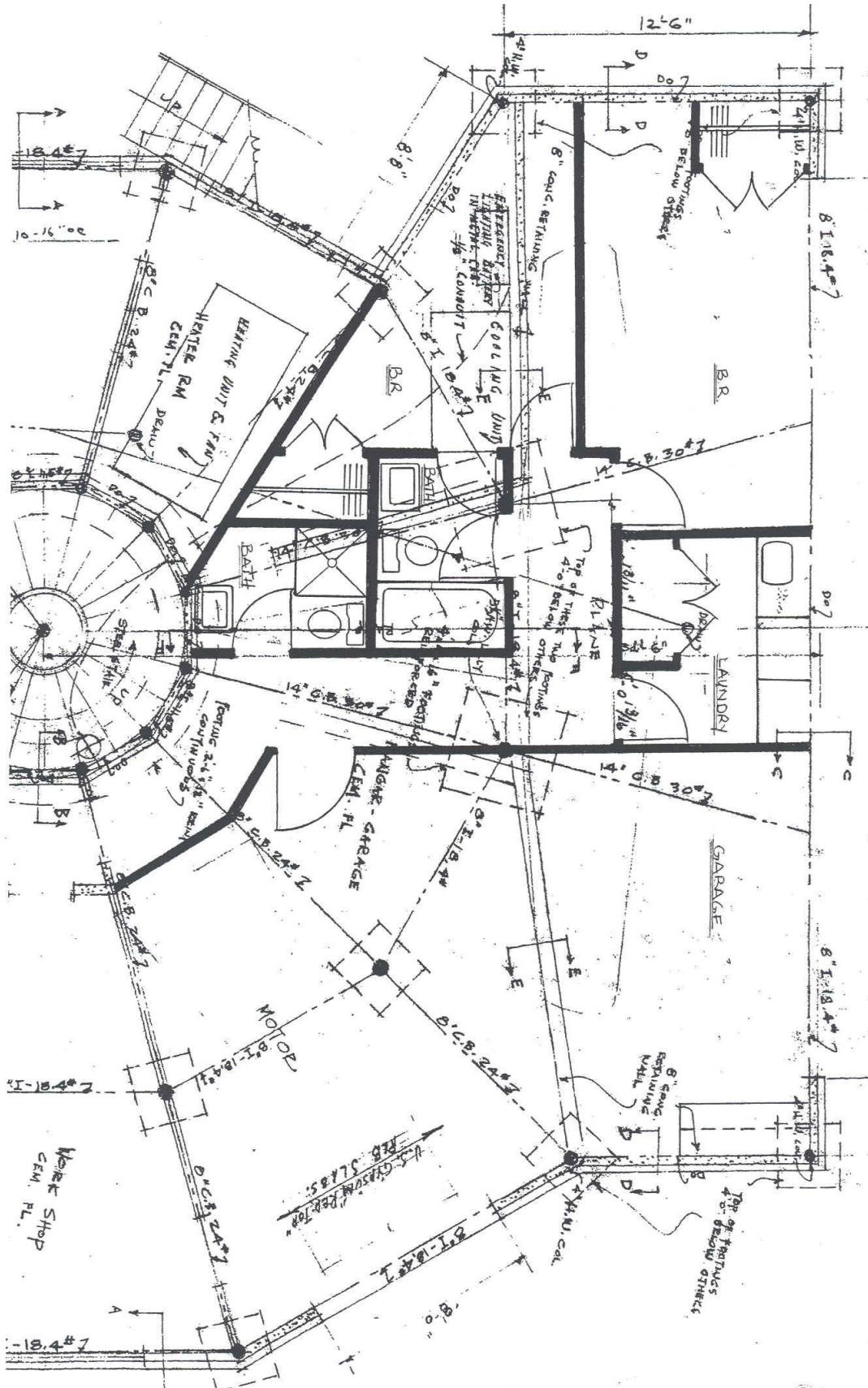
The plan is merely a division of larger spaces into usable areas with no respect to Keck's original design intent of the spaces radiating from the central core of the building.

Analysis:

- ◆ This design allows for use of the first floor as both living and service areas.
- ◆ It proposes the restoration of the garage to its original location, and the use of the western 1/3 of the hangar as garage. This option does not take into consideration that the turning radius is too tight to enter the original garage, and the use of the western half of the hangar will not only require the removal of an extensive amount of vegetation near the road, but they would also be driving over one of the existing drain fields.
- ◆ Instead of having just one partition wall abutting the hangar door, there will be two that will require camouflage.
- ◆ Some of the plumbing is centrally located causing the vent stacks to be located in the middle of the roof deck above.
- ◆ The plan does not take into consideration the locations of the walls above on the second floor.

Special Construction Requirements:

- ◆ It will require the design and construction of two overhead doors to be installed in the original locations of the garage and hangar doors. The door in the garage area will be completely inoperable allowing for use of the space as a bedroom. The door in the hangar will be approximately 1/3 inoperable and 2/3 operable, allowing for the western 1/3 of the space to be used as a bedroom and the eastern 2/3 to be used as a 2-car garage.
- ◆ It will require the relocation of the plumbing, with special emphasis placed on locating vent stacks.



TREATMENT RECOMMENDATIONS

Site Features

Siting

Due to the surrounding vegetation there will be absolutely no smoking allowed on the site, or in adjacent areas, during the rehabilitation work.

Vegetation

1. Due to the proximity of the trees on the north, west, and south sides of the house the preferred method of treatment is to trim or remove them depending upon their exact location, as per the sketch below, and replace those that were removed in kind. The new trees would be located at an appropriate distance from the structure, allowing for root growth and canopy development.
2. The national lakeshore will eradicate the garlic mustard located on site.

Exterior Furniture

The shifted sections of concrete sidewalk will be replaced in kind.

Structure

General Building Description

1. As previously stated, the structure is in poor condition as defined by the Resource Management Plan Guideline; the deterioration or damage affects more than 25% of the structure.
2. The level of moisture in the structure is too high to begin rehabilitation work. All nonhistoric deteriorated materials will be removed, and circulating fans installed in window and/or door openings temporarily to dry the structure before the rehabilitation begins.

Foundation

The on-grade slab foundation is settling causing the front one-third of the structure to subside. This movement is causing stress in the window glass in the study/recreation room and the bedroom/workshop, resulting in glass breakage.

The national lakeshore is concerned with the potential for failure of the on-grade slab foundation due to the subsiding. A structural analysis is highly recommended prior to implementing any treatment. The analysis could include removing the nonhistoric flooring material, date unknown, and determining a course of action for the possible stabilization and repair of the settling. The preferred method of treatment for the window frames is to redesign them to allow for the movement of the structure, thus eliminating the stress on the glass and breakage.

Exterior Walls

1. The vertical standing-seam copper siding is marred by a build-up of caulk, paint, and roofing tar, and there are missing and damaged pieces of siding on all levels. The preferred method of treatment is to scrape and clean all of the exterior surfaces on the first floor, (Note: when removing paint do not expose the copper), and repair and/or replace the damaged copper siding

on the first floor in kind. Repairs will include patching cracked areas and holes with copper. The patched areas will be sanded so that the patches will not be visible after the surface has been painted. All surfaces shall be painted, matching the original color. For treatment of the second and third floor exterior walls refer to the Windows & Vents section of the Treatment Recommendations. (Note: if the wall framing is found to be deteriorated beyond repair, all copper panels will be removed, cataloged, and reinstalled after the wall framing has been replaced.)

2. The standing-seam copper siding in the first floor porch area was stripped of all layers of paint by the previous resident, using a rotary sander, and varnished. The preferred method of treatment is to remove the varnish, clean the exposed copper, and paint to match the original color.

3. The original garage and hanger doors on the first floor were removed, the walls framed, and the existing operable windows installed, all circa 1935. Please note that the proposal for the rehabilitation of the first floor plan hinges upon the alternative chosen for the exterior appearance of the garage and hanger areas. The proposed design for the first floor was inspired by Keck's design philosophy and his original design.

Alternative #1 (Preferred):

Description:

The preferred treatment is to remove the operable windows and wall framing where the doors were located, and reframe the walls and door openings as per the original design. A new, non-functional, insulated garage door would be constructed, replicating the original in design, allowing for use of the space as a bedroom. A new operable door would be installed in the eastern half of the hanger door opening, allowing for use of the space as a two-car garage. A new, non-functional, insulated door would be installed in the remainder of the opening, allowing for use of the space as a bedroom. Both doors will replicate the original doors in design.

Analysis:

- ◆ we have significant documentation, including detailed photographs and drawings, to facilitate the fabrication and installation of the doors.
- ◆ this alternative allows for the reuse of the first floor as both living space and service areas, similar to Keck's original design intent.
- ◆ the significant changes made to the structure by the previous residents, most notably the alterations to the first floor, have compromised the original design. The only rooms that did not undergo change in their configuration are the study/recreation room and the bedroom/workshop.
- ◆ the wall framing is severely deteriorated due to roof leaks, leaks around the window frames, and a lack of routine maintenance.
- ◆ the original garage area can not be restored to its original use due to its proximity to the adjacent property line, which does not provide an adequate turning radius for a car to enter or exit the structure.
- ◆ this alternative will require the relocation of the driveway and the removal of part of the hedgerow that separates the rear yard from the road.

- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ custom design and construction of the non-functional insulated door panels.
- ◆ relocation of the driveway and removal of part of the hedgerow.

Alternative #2:

Description:

Remove the operable windows and wall framing where the overhead doors were located, and frame the walls and overhead door openings as per the original design. New, non-functional, insulated doors would then be constructed, replicating the originals in design.

Analysis:

- ◆ this alternative only allows for the reuse of the first floor as living space contrary to its original function as both living and service areas.
- ◆ the significant changes made to the structure by the previous residents, most notably the alterations to the first floor, have compromised the original design. The only rooms that did not undergo change in their configuration are the study/recreation room and the bedroom/workshop.
- ◆ the wall framing is severely deteriorated due to roof leaks, leaks around the window frames, and a lack of routine maintenance.
- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ custom design and construction of the non-functional insulated door panels.

Alternative #3:

Description:

Repair and/or replace deteriorated wall framing, retain the existing steel-framed windows, restore the windows, and repair and/or replace the damaged copper panels in kind.

Analysis:

- ◆ this alternative only allows for the reuse of the first floor as living space contrary to its original function as both living and service areas.
- ◆ the wall framing is severely deteriorated due to roof leaks, leaks around the window frames, and a lack of routine maintenance.
- ◆ while being the least invasive alternative, it does not complement the restoration of the second and third floor exteriors to their 1934 appearance, i.e. installation of a glass curtain wall system matching Keck's original design. See Exterior Envelope Windows & Vents section of this report.
- ◆ the restoration of the window frames is labor intensive.
- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ substantial reconstruction of wall framing.

Framing

The national lakeshore is concerned with the potential for failure of the structural system due to the addition of both dead and live loads during and after the rehabilitation of the house. A structural analysis is highly recommended prior to implementing any treatment.

1. The overall condition of the prefabricated slabs, and the integrated open-web joists is unknown, however it appears that they are in poor condition. The slabs and open-web joists appear to have severe damage in some areas due to water infiltration from roof leaks. The preferred method of treatment is to remove all deteriorated floor coverings and ceiling finish materials to complete an inspection and load testing.
2. The preferred treatment is to scrape, clean, and repaint all steel structural members, including the central tube, the tubular columns, the exposed beams, the diagonal bracing, and the third floor balustrade. All structural members originally painted black shall be painted black, and the lessee will be given the option of following the original color scheme of all other structural members as noted in the written documentation. See Appendix D, Exhibit A.
3. The preferred method of treatment is to inspect all exterior wall wood framing members after the deteriorated finish materials have been removed, and replace all deteriorated members in kind.

Insulation

The preferred method of treatment is to remove all deteriorated wall and ceiling finish materials and install insulation in the exterior walls and in the areas where the drop ceiling will be reconstructed.

Additions

1. The preferred method of treatment is to permanently remove the carport and repair and/or replace in kind any damaged copper siding. Repairs would include removing roofing tar, caulk, and paint build-up to inspect the surface for cracks and/or holes. If any cracks and/or holes can not be patched with copper, the piece would be replaced in kind. See the Exterior Walls section for additional information.
2. The preferred method of treatment is to permanently remove the screened enclosure and repair and/or replace in kind the adjacent copper panels, and install an EDPM roofing system over the original roof deck.

Exterior Envelope**Roofing**

1. The preferred method of treatment is to replace the existing roof with an EDPM rubber roofing system, repair and/or replace in kind the parapet flashing and repaint it, and install a

walkway pad system over the EDPM to protect the system from damage during use of the roof decks.

2. The door thresholds, at the exterior door openings from the second and third floors onto the roof decks, have significantly deteriorated. The preferred method of treatment is to rebuild them, providing for both code requirements for egress and sufficient height for the EDPM roofing system installation.

Gutters & Downspouts

Since there are no gutters and downspouts on the house the preferred treatment is to install foundation drains to facilitate drainage away from the structure.

Exterior Stairs and Deck Railing

1. The preferred method of treatment is to repair and/or replace in kind the exterior stairs, including stringers, treads, and risers matching the original in materials, design, and color.

2. The preferred method of treatment is to repair, sand, and repaint the handrails, stanchions, and base plates matching the original materials, design, and color.

3. After the removal of the screened enclosure, the preferred treatment is to replicate a section of handrail, including stanchions and base plates, matching the original in materials, design, and color.

Windows & Vents

1. The first floor steel frame windows have severely deteriorated due to a lack of general maintenance, and extensive moisture and water infiltration around the windows. The windows, which are glazed on the interior of the frame, are caked with caulk and paint. The preferred method of treatment is to restore them. Prior to their restoration the windows should be removed from the structure, and the glass removed from the frames, catalogued and stored. The frames should be sanded, repaired, and repainted, after which the original glass should be reinstalled and recaulked. Please note, reflective coatings to reduce heat gain within the building shall not be allowed on any window glass used within the building as it would change the architectural detailing and visual characteristics of Keck's original design.

Alternative #1 (Preferred):

Description:

Retrofit the steel window frames so that thermopane glass could be installed to protect the structure from extremes in temperature.

Analysis:

- ◆ the steel window frames are in need of extensive repair due to severe levels of deterioration, and retrofitting for thermopane glass could be done at the same time.
- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ retrofit the steel window frames for the installation of thermopane glass.

Alternative #2:

Description:

Interior or exterior storm windows would be installed on all first floor windows to protect the structure from extremes in temperature.

Analysis:

- ◆ a window type should be chosen that will not deter from the design of the original windows.
- ◆ a window type should be chosen that will protect the steel frames from a build-up of condensation that could cause deterioration.
- ◆ a window type should be chosen that will not damage, or require the removal of, the original window hardware.
- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ none

Alternative #3:

Description:

Do not utilize storm windows.

Analysis:

- ◆ the expense of heating the structure would be greatly increased.

Special Construction Requirements:

- ◆ none

2. The second and third floor steel frame windows, circa early 1935, have severely deteriorated due to a lack of general maintenance, and extensive moisture infiltration around the windows. The windows, which are glazed on the interior of the frame, are caked with caulk and paint. The wood framing surrounding the windows has deteriorated to the point that there are significant gaps in the framing and holes in the walls.

Alternative #1 (Preferred):

Description:

The preferred method of treatment is to permanently remove the operable windows and copper clad wood framed wall system on the second and third floors in preparation for the installation of a fixed glass curtain wall system with tinted glass¹²¹, matching Keck's original design in character. Please note, reflective coatings to reduce heat gain within the building shall not be allowed on any window glass used within the building as it

¹²¹ Boyce. Appendix D, Exhibit C.

would change the architectural detailing and visual characteristics of Keck's original design. In addition, due to the fact that the aluminum finished venetian blinds, roller shades, and curtains were vital elements to the original design of the building it is recommended that they be replicated, matching Keck's original design intent.

Analysis:

- ◆ we have significant documentation, including detailed photographs, drawings, and physical evidence, i.e. the original sill plate of the curtain wall system on the third floor, to facilitate the fabrication and installation of the new curtain wall system.
- ◆ the wall framing is severely deteriorated due to roof leaks, leaks around the window frames, and a lack of routine maintenance by previous residents.
- ◆ the new curtain wall system will be a double paned insulated system.
- ◆ removal of all windows, and disposal of all except one to be retained for the museum collection.
- ◆ removal and disposal of all wall framing materials and any insulation that is found.
- ◆ removal of all copper siding, and after the installation of the curtain wall has been completed, replace the siding above the system on the spandrel beams. Maintain all other siding that is in good condition for current and future repairs to the siding on the first floor, while disposing that which is unusable.
- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ careful removal of all wall framing so the concrete structural system is not damaged.
- ◆ installation of the new double paned curtain wall system, taking into consideration how it might change the visual appearance of the house and the dead weight loading that will be placed on the structural system.

Alternative #2:

Description:

The steel frame windows could be retained and restored. Prior to their restoration the windows would be removed from the structure, and the glass removed from the frames, catalogued and stored. The frames would be sanded, repaired, and repainted, after which the original glass would be reinstalled and recaulked. The surrounding turned copper panels would be repaired and/or replaced in kind. Please note, reflective coatings to reduce heat gain within the building shall not be allowed on any window glass used within the building as it would change the architectural detailing and visual characteristics of Keck's original design.

Analysis:

- ◆ the wall framing is severely deteriorated due to roof leaks, leaks around the window frames, and a lack of routine maintenance.
- ◆ this alternative will require substantial reconstruction of the wall framing.
- ◆ disposal of all deteriorated wall framing materials and any insulation that is found.
- ◆ removal and storage of all copper siding during the reconstruction of the wall framing.
- ◆ repair and/or replace damaged copper siding.

- ◆ the restoration of the window frames is labor intensive.
- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ careful removal of all wall framing so the concrete structural system is not damaged.
- ◆ substantial reconstruction of the wall framing.

3. The original steel-framed window, a horizontal single-paned rectangular fixed window with two lights, in the study/recreation room was destroyed in 1965 during a storm. It was replaced with a wood-framed window similar to the three-part steel-framed window used in the living room/hanger. However, the existing window does not have casements; it is completely fixed. See oral history interview, Appendix D, Exhibit D. The preferred method of treatment is to remove the nonhistoric wood frame window and replace it with a new window, matching the original in design and materials. Please note, reflective coatings to reduce heat gain within the building shall not be allowed on any window glass used within the building as it would change the architectural detailing and visual characteristics of Keck's original design.

Exterior Doors

1. The preferred treatment is to restore the one original metal clad wood door, and to replace those that are not original with replicas of the original.
2. Garage door – See the Structure Exterior Wall section of this report.
3. Hanger door - See the Structure Exterior Wall section of this report.

Chimney

See the Fireplace section of this report.

Interior

Partition Framing

1. The preferred method of treatment is to remove all deteriorated finish materials and inspect the interior partition framing members. All deteriorated members will be replaced in kind.
2. The preferred treatment is to frame new partitions on the first floor, finish with drywall, and paint. The design for reusing the first floor was inspired by Keck's design philosophy and his original design of the first floor. Refer to the Structure Exterior Walls section of this report and see the drawing of the proposed first floor plan.
3. The preferred treatment is to permanently remove the nonhistoric partitions on the first floor, frame new partitions, finish with drywall, and paint. Please refer to the drawing of the proposed first floor plan.

Interior Stairs

The original interior stairs, from the first floor to the third floor, appear to be in excellent condition as there is no deflection when weight is applied. The preferred treatment is to remove all of the deteriorated floor coverings and complete a thorough inspection before choosing a course of action.

Wall Finishes*First Floor*

1. The preferred method of treatment is to remove the deteriorated historic and nonhistoric ceiling and wall finish materials, inspect the structural members for level of deterioration, and repair and/or replace any deteriorated structural members in kind. All deteriorated finish materials on the walls will be replaced with drywall except as noted in #2 below, similar to Keck's original design. All historic wall finish materials that are not deteriorated shall be retained. The lessee will be given the option of painting the walls as per the original color scheme noted in historic photographs and written documentation. Prior to installing new wall finish materials insulation should be installed in the exterior walls; please note the ceilings shall remain exposed as per Keck's original design.

2. The original paneling, a metal clad insulation board, in the dining room/garage and bedroom/workshop was covered with wood paneling by the residents, and the glass of the observation window between the rooms was painted. See oral history interview Appendix D, Exhibit D. The preferred method of treatment is to remove the nonhistoric paneling, restore the original metal paneled walls, and restore the observation window.

3. The entry hall walls, finished with plasterboard that might be the original, were covered with oyster shells by the previous residents. The application of the shells has resulted in severe damage to the plasterboard. The original plasterboard ceiling in the entry hall was replaced by the residents with Masonite, yet they retained the original design and height. This material is in good condition. The preferred method of treatment is to remove the shells and damaged plasterboard and replace with drywall, and temporarily remove the ceiling to install insulation.

4. The wood framed walls that surround the stairway were placed just beyond the tubular steel columns so that the columns, and the vertical ductwork between them, were left exposed. The preferred treatment is to repair and/or replace the plasterboard in kind and paint, matching Keck's original colors.

Room No.	Current/Historic Room Names	Wall No.	Original Material – Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials	Repair and or Replace with
	First Floor				
101	Entry Hall	101-1	Plasterboard – possibly	1) Plasterboard 2) Oyster Shells	Drywall
		101-2	Plasterboard – possibly	1) Plasterboard 2) Oyster Shells	Drywall
		101-3	Plasterboard – possibly	1) Plasterboard 2) Oyster Shells	Drywall
		101-4	Plasterboard – possibly	1) Plasterboard 2) Oyster Shells	Drywall
		101-5	Plasterboard – possibly	1) Plasterboard 2) Oyster Shells	Drywall
		101-6	Plasterboard – possibly	1) Plasterboard 2) Oyster Shells	Drywall
		101-7	Plasterboard – possibly	1) Plasterboard 2) Oyster Shells	Drywall
		101-8	Plasterboard – possibly	1) Plasterboard 2) Oyster Shells	Drywall
		101-9	Plasterboard – possibly	1) Plasterboard 2) Oyster Shells	Drywall
101a	Stairway	All	Plasterboard – possibly	1) Plasterboard	Drywall if necessary
101b	Closet under Stair	101b-1	Plasterboard – no	1) Fiberboard	Drywall
		101b-2	Plasterboard – no	1) Fiberboard	Drywall
		101b-3	Plasterboard – no	1) Fiberboard	Drywall
		101b-4	Plasterboard – no	1) Fiberboard	Drywall
		101b-5	Plasterboard – no	1) Fiberboard	Drywall
102	Study/Recreation Room – all original walls painted “dead white” to contrast bright blue ceiling and the “spectrum colors” of the ductwork	102-1	Plasterboard – no	1) Fiberboard 2) Fabric	New Guest Room – Drywall
		102-2	Plasterboard – no	1) Plywood	Drywall
		102-3	Plasterboard – no	1) Plywood	Drywall
		102-4	Plasterboard – no	1) Painted Paneling	Drywall
		102-5	Plasterboard – no	1) Painted Paneling	Drywall

103	Mechanical Room – all original walls painted with aluminum paint to contrast primary colors of the ductwork	103-1	Plasterboard – no	1) Peg Board	New Mechanical Room and Laundry Room - Drywall
		103-2	Plasterboard – no	1) Fiberboard	Drywall
		103-3	N.A.	1) Pressed Board	Removed
		103-4	N.A.	1) Open studs	Removed
		103-5	N.A.	1) Peg Board	Removed
		103-6	N.A.	1) Peg Board	Removed
		103-7	Plasterboard – no	1) Peg Board	In New Laundry
		103-8	Plasterboard – no	1) Peg Board	Drywall
		103-9	Plasterboard – no	1) Peg Board	Drywall
104	Back Hall/ Mechanical Room	104-1	N.A.	1) Painted Paneling	New Garage - Removed
		104-2	Plasterboard – no	1) Painted Paneling	Drywall
		104-3	Plasterboard – no	1) Painted Paneling	Drywall
		104-4	N.A.	1) Painted Paneling	Removed
		104-5	Plasterboard – no	1) Painted Paneling	Removed
		104-6	N.A.	1) Painted Paneling	Removed
		104-7	N.A.	1) Painted Paneling	Removed
105	Living Room/ Airplane Hangar/	105-1	N.A.	1) Painted Concrete Block	New Garage - Removed
		105-2	Plasterboard – no	1) Painted Paneling	Removed
		105-3	N.A.	1) Painted Paneling	Removed
		105-4	Plasterboard – no	1) Painted Paneling 2) Silk	Drywall
		105-5	Plasterboard – no	1) Plywood 2) Silk	Drywall
		105-6	N.A.	1) Plasterboard	Removed
		105-7	N.A.	1) Plasterboard	Removed
106	Laundry/Airplane Hangar	106-1	N.A.	1) Pressed Board	New Bedroom – Removed
		106-2	N.A.	1) Plasterboard	Removed
		106-3	Plasterboard – no	1) Plywood	Drywall
		106-4	Plasterboard – possibly	1) Plasterboard	Drywall

107	¾ Bathroom/Garage	107-1	Plasterboard - ?	1) ? 2) Ceramic Tile	New Full Bath - Drywall
		107-2	N.A.	1) ? 2) Ceramic Tile	Removed
		107-3	N.A.	1) ? 2) Ceramic Tile & Pressed Board	Removed
108	Kitchen/Airplane Hangar	108-1	N.A.	1) Plasterboard	New ¾ Bath, Hall & Garage - Removed
		108-2	N.A.	1) Painted Vertical Boards	Removed
		108-3	Plasterboard - no	1) Pressed Board	Drywall
		108-4	Plasterboard - no	1) Pressed Board	Drywall
		108-5	N.A.	1) Pressed Board	Removed
		108-6	N.A.	1) Pressed Board	Removed
109	Dining Room/ Garage	109-1	N.A.	1) Plasterboard 2) Painted Concrete Block	New Bedroom - Removed
		109-2	Plasterboard - no	1) Painted Vertical Boards	Drywall
		109-3	Metal covered insulation board - yes	1) Metal covered insulation board 2) Painted Vertical Boards	Metal covered insulation board
110	Bedroom/ Workshop – all original walls painted with aluminum paint to contrast the orange floor	110-1	Metal covered insulation board - yes	1) Metal covered insulation board	New Bedroom - Metal covered insulation board
		110-2	Metal covered insulation board - ?	1) ? 2) Carpet	Metal covered insulation board or Drywall
		110-3	Metal covered insulation board - yes	1) Metal covered insulation board 2) Painted Paneling	Metal covered insulation board
		110-4	Metal covered insulation board - yes	1) Metal covered insulation board	Metal covered insulation board

Second Floor

1. The preferred method of treatment is to remove the deteriorated historic and nonhistoric ceiling and wall finish materials, inspect the structural members for level of deterioration, and repair and/or replace any deteriorated structural members in kind. Note the finish materials on the exterior walls will be removed in preparation for the installation of the glass curtain wall system. All deteriorated finish materials on the interior partition walls will be replaced with drywall, except as noted in #2 below, similar to Keck's original design. All historic finish materials that are not deteriorated shall be retained. The lessee will be given the option of painting the walls as per the original color scheme noted in historic photographs and written documentation. Prior to installing the new finish materials insulation should be installed in the exterior walls, above and below the new curtain wall system, and in the ceilings.
2. One piece of the original polished black Carrara glass is missing in the living room, and numerous pieces of the original polished white Carrara in the bathroom are cracked or broken. The preferred treatment is to replace the missing, cracked or broken Carrara glass in kind utilizing a polished opaque glass similar to the original. The replacement material is only different from the original in its thickness.
3. The wood framed walls that surround the stairway were placed just beyond the tubular steel columns so that the columns, and the vertical ductwork between them, were left exposed. The preferred treatment is to repair and/or replace the plasterboard in kind and paint, matching Keck's original colors.
4. The original drop ceiling of wood frame and plasterboard was removed in the 1960's in all rooms on the second floor except the Master Bedroom and portions of the Kitchen. It had been severely damaged due to extensive roof leaks. The ceiling in the Master Bedroom is in good condition, having received only a slight amount of water damage from roof leaks, and the ceiling in the Kitchen is in poor condition. The drop ceiling in all rooms on the second floor included a recessed cove adjacent to the curtain wall system. This was designed to accommodate the Venetian blinds, and roller shades as specified by Keck. The shear drapes were hung from a track attached directly to the ceiling adjacent to the cove. The preferred treatment is to frame and finish the drop ceiling with drywall, similar to Keck's original design. (Note: retain the exposed structural framing on the first and third floors, complete paint analysis, and paint as noted in Appendix D, Exhibit A.)

Room No.	Current/Historic Room Names	Wall No.	Original Material – Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials	Repair and or Replace with
	Second Floor				
201	Master Bedroom	201-1	Plasterboard - no	1) Drywall 2) Burlap 3) Fabric	New Study - drywall
		201-2	End-grain Pine Blocks - yes	1) End-grain Pine Blocks	End-grain Pine Blocks
		201-3	End-grain Pine Blocks - yes	1) End-grain Pine Blocks	End-grain Pine Blocks
		201-4	Plasterboard/poss.	1) Plasterboard	Drywall
		201-5	Plasterboard/poss.	1) Plasterboard	Glass Curtain Wall
		201-6	Plasterboard/poss.	1) Plasterboard	Glass Curtain Wall
202	Bathroom	202-1	White Carrara Glass – yes	1) White Carrara Glass	White Carrara Glass or Substitute
		202-2	White Carrara Glass – yes	1) White Carrara Glass	White Carrara Glass or Substitute
		202-3	Plasterboard/poss.	1) Plasterboard	Glass Curtain Wall
		202-4	White Carrara Glass – yes	1) White Carrara Glass	White Carrara Glass or Substitute
203	Children’s Bedroom	203-1	Plasterboard/poss.	1) Plasterboard	New Master Bedroom - Drywall
		203-2	Plasterboard – no	1) Drywall 2) Carpet	Glass Curtain Wall
		203-3	Plasterboard – no	1) Drywall 2) Carpet	Glass Curtain Wall
		203-4	Plasterboard/poss.	1) Plasterboard	Drywall
		203-5	Plasterboard/poss.	1) Plasterboard	Drywall
		203-6	Plasterboard/poss.	1) Plasterboard	Drywall
204	Kitchen	204-1	Plasterboard/poss.	1) Plasterboard	Drywall
		204-2	Plasterboard/poss.	1) Plasterboard	Glass Curtain Wall
		204-3	Plasterboard/poss.	1) Plasterboard	Glass Curtain Wall
		204-4	Plasterboard/poss.	1) Plasterboard	Drywall
		204-5	Plasterboard/poss.	1) Plasterboard 2) Ceramic Tile	Drywall
205	Dining & Living Room	205-1	Gray Carrara Glass - yes	1) Gray Carrara Glass	Gray Carrara Glass
		205-2	Plasterboard/poss.	1) Plasterboard 2) Carpet	Glass Curtain Wall
		205-3	Plasterboard/poss.	1) Plasterboard 2) Carpet	Glass Curtain Wall
		205-4	Plasterboard/poss.	1) Plasterboard 2) Carpet	Glass Curtain Wall
		205-5	Plasterboard/poss.	1) Plasterboard 2) Carpet	Glass Curtain Wall
		205-6	Plasterboard - possibly	1) Plasterboard 2) Carpet	Glass Curtain Wall
		205-7	Plasterboard - yes	1) Plasterboard 2) Fabric	Drywall

		205-8	Black Carrara Glass - no	1) Black Carrara Glass	Black Carrara Glass or Substitute
		205-9	Black Carrara Glass - yes	1) Black Carrara Glass	Black Carrara Glass
		205-10	Black Carrara Glass - yes	1) Black Carrara Glass	Black Carrara Glass

Third Floor

1. The preferred method of treatment is to remove the nonhistoric wall finish materials in preparation for the installation of the glass curtain wall system. All structural members, including turnbuckles, shall be inspected for level of deterioration, and repaired and/or replaced in kind. Prior to installing the drywall insulation should be installed in the exterior walls above and below the curtain wall.

Room No.	Current/Historic Room Names	Wall No.	Original Material – Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials	Repair and/or Replace with
	Third Floor				
301	Sunroom/Solarium	301-1	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-2	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-3	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-4	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-5	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-6	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-7	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-8	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-9	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-10	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-11	Curtain Wall & Plasterboard – no	1) Paneling 2) Carpet	Curtain Wall System
		301-12	Curtain Wall & Plasterboard –no	1) Paneling 2) Carpet	Curtain Wall System

Floor Finishes

First Floor

The preferred method of treatment is to remove the nonhistoric flooring materials, and investigate the condition of any historic flooring materials if found. If found, they should be repaired and/or replaced in kind. Please note the rubber tile may contain asbestos. The only written evidence for materials and colors used on the first floor were found in Appendix D, Exhibit A.

Room No.	Current/Historic Room Names	Original Material	Orig. Material Still in Existence	Existing Base Material / Intermediate Material / Top Material	New Material
	First Floor				
100	Front Porch	?	?	1) Painted Concrete – Red 2) Painted Concrete – Gray	Painted Concrete
101	Entry Hall	?	?	1) Black Rubber Tile (?) 2) Ceramic Tile	Vinyl Tile
101a	Stairway	Black Rubber Tile	yes	1) Black Rubber Tile 2) Carpet	Vinyl Tile
101b	Closet under Stair	?	?	1) Unpainted Concrete	Unpainted Concrete
102	Study/Recreation Room	Bright Blue Rubber Tile	no	1) Bare Concrete 2) Carpet	Vinyl Tile
103	Mechanical Room	Painted Concrete – Red-Orange	yes	1) Painted Concrete – Red-Orange	Mech. and Laundry - Painted Concrete
104	Back Hall /Mechanical Room	Painted Concrete – Red-Orange	possibly	1) ? 2) Ceramic Tile	New Garage - Concrete
105	Living Room/ Airplane Hangar	?	?	1) Bare Concrete 2) 6" x 6" Rubber Tile (not extant) 3) Carpet 4) Carpet	New Garage - Concrete
106	Laundry/Airplane Hangar	?	?	1) Splatter Painted Black Rubber Tile	New Bedroom – Vinyl Tile or Low Pile Carpet
107	¾ Bathroom/Garage	?	?	1) ? 2) Ceramic Tile	New Full Bath – Vinyl Tile
108	Kitchen/Airplane Hangar	?	?	1) Red Rubber Tile 2) Carpet 3) Carpet	New ¾ Bath, Hall – Vinyl Tile

109	Dining Room/ Garage	?	?	1) Painted Concrete 2) Carpet 3) Carpet	New Bedroom – Vinyl Tile or Low Pile Carpet
110	Bedroom/ Workshop	Painted Concrete – Orange	?	1) ? 2) +/- 18" x 24" Black Rubber Tile 3) Carpet	New Bedroom – Painted Concrete, Vinyl Tile, or Low Pile Carpet

Second Floor

The preferred method of treatment is to remove the nonhistoric flooring materials, and investigate the condition of any historic flooring materials if found. If found, they should be repaired and/or replaced in kind. Please note the rubber tile may contain asbestos. The wood flooring located in the living and dining rooms, and the master bedroom, shall be repaired and/or replaced in kind, and refinished.

Room No.	Current/Historic Room Names	Original Material	Orig. Material Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials	New Material
	Second Floor				
201	Master Bedroom	End-grain Pine Blocks	yes	1) End-grain Pine Blocks	New Study End-grain Pine Blocks
202	Bathroom	Pink Rubber Tile	yes	1) Pink Rubber Tile 2) Black Rubber Tile 3) Carpet	Vinyl Tile
203	Children's Bedroom	Turquoise Rubber Tile	yes	1) Turquoise Rubber Tile 2) Carpet	New Master Bedroom – Vinyl Tile
204	Kitchen	Brown Rubber Tile	yes	1) Brown Rubber Tile 2) Black & White Rubber Tile 3) Carpet	Vinyl Tile
205	Dining & Living Room	End-grain Walnut Blocks	yes	1) End-grain Walnut Blocks 2) Carpet	End-grain Walnut Blocks

Third Floor

The preferred method of treatment is to remove the nonhistoric flooring materials, and investigate the condition of any historic flooring materials if found. If any are found, they should be repaired and/or replaced in kind. Please note the rubber tile may contain asbestos.

Room No.	Current/Historic Room Names	Original Material	Orig. Material Still in Existence	Existing Base Materials / Intermediate Materials / Top Materials	New Material
	Third Floor				
301	Sunroom/Solarium	Black & White Rubber Tile	yes	1) Black & White Rubber Tile 2) Particle Board 3) Carpet	Black & White Vinyl Tile

Interior Doors

All of the original interior doors were flush metal clad wood doors hung in metal frames, with the exception of the first floor entry hall closet.

1. First Floor - All of the original doors have been replaced. The preferred treatment is to remove the nonhistoric doors and replace them with metal clad wood doors as per Keck's original design.
2. First Floor - The door currently on the entry closet is an original metal panel door, however it does not belong on the closet. The door matches the design of the original metal paneling used in the workshop, and could possibly be from that room. The preferred treatment is to remove this historic door from the entry closet, relocating it to another doorframe, and replace it with an accordion door as per Keck's original design.
3. Second Floor - All of the original doors have been replaced. The preferred treatment is to remove the nonhistoric doors and replace them with metal clad wood doors as per Keck's original design.

Cabinets/Built-in Furniture

1. The first floor kitchen cabinets, installed in 1969, are pulling away from the walls. The preferred treatment is to permanently remove this kitchen, including cabinets and equipment.
2. There are four closets that have been added on the first floor, most dates unknown, which were not part of the original design. The preferred treatment is to permanently remove them.
3. A closet was added in the children's bedroom on the second floor that was not part of the original design, date unknown. The preferred treatment is to permanently remove it.
4. Most of the original enameled metal kitchen cabinets on the second floor are still in place. The preferred method of treatment is to strip, clean, repair, and refinish the existing cabinets.

Cabinets that are not original should be replaced with ones matching the original in design and materials.

Fireplace

Keck had not included any type of fireplace in his original design for the house. The existing gas log fireplace on the second floor, and the prefabricated metal chimney, were added in 1966 by the previous residents. The preferred treatment is to permanently remove them.

Plumbing Systems**Water Supply**

The house is currently serviced by a well located adjacent to Lake Front Drive. The condition of the well, and the equipment types are unknown. The replacement of the well has been addressed under a separate 106 compliance document. The existing interior water distribution system is comprised of galvanized steel, copper, and PVC piping. The preferred treatment is to inspect all existing water lines; remove those that do not meet current codes, replacing them with new lines, and repair and/or replace those that do meet current codes.

Sanitary Sewer System

The house is currently serviced by a septic tank and drain field. The location/s, condition, and equipment types (i.e. lift stations) are unknown. The replacement of the septic system has been addressed under a separate 106 compliance document.

Plumbing & Fixtures

1. The first floor $\frac{3}{4}$ bathroom was not part of the original design, date unknown.

Alternative #1 (Preferred):**Description:**

The preferred treatment is to implement the lessee's proposed floor plan. The existing $\frac{3}{4}$ bathroom and associated window would be removed, and a new $\frac{3}{4}$ bathroom and a full bathroom would be installed.

Analysis:

- ◆ this will allow the first floor to be efficiently used as living space.
- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ demolition of the existing $\frac{3}{4}$ bathroom.
- ◆ removal of existing plumbing, and installation of new plumbing.

Alternative #2:**Description:**

Permanently remove the $\frac{3}{4}$ bathroom and the associated window.

Analysis:

- ◆ this alternative does not allow for the efficient use of the first floor as living space.
- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ demolition of the existing $\frac{3}{4}$ bathroom.

2. The plumbing in the second floor's bathroom and kitchen will require inspection and possible repair and/or replacement. The preferred method of treatment is to inspect it, and repair as necessary or replace in kind while maintaining all of the original cabinets and fixtures.

Heating and Air-conditioning Systems

It is now possible through the advances made in technology to achieve Keck's original design intent - to eliminate the need of operable windows by using a glass curtain wall system and an air-conditioning system.

1. The original forced air heating system, with ductwork, was replaced with a boiler and baseboard heating units in 1962. The original ductwork, part of which is still in place, was an essential visual element in the design of the first floor, having been left exposed and painted to accent the colors chosen for each room. See Appendix D, Exhibit A.

The preferred treatment is to remove the nonhistoric baseboard heating units and the existing boiler. A new forced air heating system would be installed, utilizing the existing original ductwork. Any original ductwork that is missing shall be replicated utilizing visual evidence, such as existing connections and holes through the floors, and historic photographs. The ductwork for the second floor will be concealed within the new drop ceiling, matching Keck's original design intent.

2. The original water-cooled air-conditioner was removed from the building, date unknown. A new air-conditioner shall be installed utilizing the ductwork for the forced air heating system, as noted above. The new system should include a humidity control system to regulate interior moisture levels.

Electrical Systems

Power Supply & Distribution

1. The original aerial electrical service comes into the structure on the south, or rear, elevation of the house.

Alternative #1 (Preferred): The preferred treatment is to leave the service entrance where it is located; rewiring it to meet current building codes if necessary. This alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Alternative #2: Place the service underground. This alternative meets the requirements within the Secretary's Standards for Rehabilitation.

2. The electrical wiring and distribution panel were conventional for the time period of construction, and do not meet current building codes. The preferred method of treatment is to remove the electrical wiring on all levels and rewire, utilizing existing conduit if possible, to bring up to current building code. Additional outlets will be required. The historic fuse box should be retained for exhibit purposes only.

Electrical Fixtures and Devices

1. It is important to note that the lighting was an important element in the design of the house. Keck utilized fixed lighting in the first floor's recreation room, and the second floor's dining room and kitchen, and the central stair, while using portable fixtures of his own design in all other spaces. The preferred method of treatment is to replicate original fixtures in those rooms where it is applicable and utilize portable light fixtures, table and floor lamps, in all other spaces, both to retain Keck's original design intent.
2. The original indirect lighting system in the central stair, still in existence, was a vital element in the design of the house. It has not been inspected for operation or safety. The preferred treatment is to repair and/or replace the fixtures in kind, while retaining Keck's original design intent.
3. The other existing light fixtures, date unknown and not original to the house, are in poor condition due to their age and lack of maintenance.

Alternative #1 (Preferred):

Description:

The preferred treatment is to remove the existing light fixtures, any surface mounted conduit, and doorbells. The light fixtures would be replaced with replicas of the original or ones that are appropriate to the 1930's and the architectural design.

Analysis:

♦ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

♦ none

Alternative #2:

Description:

The Lessee would be given the option to install fixtures that are not of the period, or that do not reflect the architectural design, with prior approval of the National Park Service.

Analysis:

♦ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ none

4. There are no exterior light fixtures on the house or on site.

Alternative #1(Preferred):

Description:

To utilize unobtrusive exterior lights on the stairs, both from the street up to the house and on the stairs to the roof decks, for safety, and unobtrusive automatic lights as intrusion alarms with prior approval of the National Park Service.

Analysis:

- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ none

Alternative #2:

Description:

The Lessee would be given the option to install fixtures that are not of the period, or that do not reflect the architectural design, with prior approval of the National Park Service.

Analysis:

- ◆ this alternative meets the requirements within the Secretary's Standards for Rehabilitation.

Special Construction Requirements:

- ◆ none

Kitchen Appliances

1. The original dishwasher, still in existence, was finished in a sand color, but has been painted repeatedly. It is not currently operable. The preferred method of treatment is to strip, clean, and refinish the exterior and repair the appliance to operating condition.
2. The other appliances, including the refrigerator and stove in the second floor kitchen, were removed after the closing of the Exposition in 1934. The preferred treatment is to utilize new contemporary fixtures that compliment the original interior design of the kitchen.

Furnishings

1. There is substantial documentation on the furnishings used at the Century of Progress Exposition. See Appendix D, Exhibits A and B. The last resident of the house, prior to the expiration of the Special Use Permit in 1998, furnished the house with eclectic pieces.

Freestanding furniture is considered a personal possession, so when the SUP expired the residents removed it. The house currently stands empty.

2. The original second floor bathroom mirror was removed and replaced by the existing medicine cabinet and mirror. The national lakeshore is in possession of the original mirror, and it can be reinstalled. The preferred treatment is to remove the nonhistoric medicine cabinet, reinstall the original mirror and replicate the original glass shelf and lighting utilizing historic photos as references.

Accessibility

Because the house will be used as a private residence, with public visitation limited to one day a year, the preferred treatment is to open only the first floor for the annual house tour. Additional access to the interior of the house would adversely affect the historic integrity and appearance of the house. To make the second and third floors accessible would entail loss of historic fabric and degradation of character. To interpret areas of the houses that are not accessible, photographic displays would be produced and exhibited during the annual house tour.

Life Safety

The house was not designed as a private residence, however since it was originally designed as an exhibit building for the 1933 Century of Progress Exposition, with hundreds of visitors on a daily basis, it does provide the opportunity for safe and expedient egress in case of fire. The house has two openings leading to the exterior on the first floor, the back door on the east end of the house, and the front door on the north side of the house. There are also two exterior doors from the second floor onto the roof deck, one on the west side and one on the south side, and one door from the third floor onto the roof deck. There are exterior stairs leading from the roof decks to the exterior of the first floor. It is required under the lease agreement with HLF that residents maintain fire extinguishers in the house.

The national lakeshore further recommends:

1. Extinguishers should be placed in: the mechanical room on the first floor and other areas where fire might be a danger based on the use of the structure; the kitchen and each bedroom on the first and second floor; and on the third floor.
2. A security system should be installed that includes a smoke detection system.

SUMMARY OF TREATMENT RECOMMENDATIONS

Use Program

Through a Memorandum of Understanding with Historic Landmarks Foundation of Indiana (HLFI), it is the intent of the national lakeshore and HLFI that the Century of Progress houses, including the House of Tomorrow, be protected under the auspices of a residential leasing program. To facilitate this program, the national lakeshore leased all of the Century of Progress houses, with the exception of the Armco-Ferro-Mayflower House, to HLFI for a period of 35 years; in-turn, HLFI is responsible for recruiting potential lessees for each house. The individual houses would be leased to interested parties for a period of 30 years. The lessees would be responsible for completing the rehabilitation project within the first 3 years of the lease following the Secretary of the Interior's Standards.

Accessibility

Since the structure is to be used as a private residence, and would only be open one day a year for public visitation, accessibility would be accommodated in alternative ways.

Construction of accessible routes to and within the structure would adversely affect the historic integrity and appearance of the site and structure. The historic front entrance to the site, located on Lake Front Drive, is not accessible and the construction of a substantial ramp from Lake Front Drive to the structure would not only adversely affect the cultural landscape it would be cost prohibitive. A clear and level path to the back door will be provided, as will the services of a volunteer or staff member, to assist any visitors requiring assistance.

To make the structure's interiors, including the second and third floors and bathrooms, code-accessible would entail the loss of historic fabric and degradation of historic character. The floor plan would have to be severely redesigned to accommodate an elevator and an accessible bathroom. The structural system would have to be altered, and wall, ceiling, and floor fabric, and door trim would be lost. To provide interpretation of the areas that are not accessible, photo displays would be utilized during the tours, and would be set up on the first floor. To provide for restroom accessibility, port-a-johns would be placed near the site for public use during the annual, one day, open house.

Fire Detection

The structure would be protected with a smoke detection system connected to an alarm system. The alarm company would notify the local fire departments, including Beverly Shores of which the national lakeshore currently has a mutual aid agreement. The keypad for the alarm system would be located near the back door for ease of access. Smoke detectors would be installed in at least the entry hall, the first floor bedroom hall, the kitchen, the second floor bedroom hall, and on the third floor.

Site Features

- ◆ Remove overgrown vegetation and replace in kind at an appropriate distance.
- ◆ Eradicate garlic mustard.
- ◆ Replace sidewalk in kind.

Structure

- ◆ Remove all deteriorated finish materials and ventilate structure.
- ◆ Remove nonhistoric flooring in entry hall and determine course of action for stabilization of subsiding slab foundation.
- ◆ Redesign window frames in first floor study and bedroom to accommodate shifting in structure and eliminate glass breakage.
- ◆ Scrape and clean all exterior copper surfaces on first floor, and repair and/or replace damaged copper panels in kind.
- ◆ Remove varnish from exposed copper panels in first floor porch, clean copper, and paint to match original color.
- ◆ Remove operable windows in original garage and hanger areas, reframe walls with overhead garage and hanger door openings, and install functional and non-functional insulated doors matching original in design for reuse of first floor as both living and service areas.
- ◆ Remove all deteriorated floor coverings and ceiling finish materials to inspect concrete and steel structural system, and determine course of action.
- ◆ Scrape, clean, and repaint all exposed steel structural members.
- ◆ Inspect all exterior wood framing members, and replace deteriorated members in kind.
- ◆ Remove all deteriorated wall and ceiling finish materials and install insulation where appropriate.
- ◆ Permanently remove carport, and repair and/or replace damaged copper panels.
- ◆ Permanently remove screened enclosure, and repair and/or replace roof decking and copper panels.

Exterior Envelope

- ◆ Replace felt roof with an EDPM rubber roofing system; repair and repaint parapet, or replace in kind; and install a walkway pad system over roofing system.
- ◆ Rebuild door thresholds at exterior openings onto roof decks, while meeting egress and EDPM roofing system requirements.
- ◆ Install foundation drains to facilitate drainage away from structure.
- ◆ Repair and/or replace exterior stairs, including stringers, treads, and risers, in kind.
- ◆ Repair, sand, and repaint handrails, stanchions, and base plates matching originals in material, design, and color.
- ◆ Replicate missing section of handrail for second floor roof deck, matching original in material, design, and color.
- ◆ Restore all first floor steel window frames and retrofit for thermo-paned glass.
- ◆ Permanently remove existing operable steel frame windows on the second and third floor, replacing them with a fixed glass curtain wall system, matching Keck's original design in character.
- ◆ Permanently remove existing wood framed window in the first floor study, and replace with replica of original, matching original in materials and design.
- ◆ Restore original exterior door and frames, and replace nonhistoric doors with replicas of original matching materials and design.

Interior

- ◆ Repair and/or replace wood wall framing members in kind after inspection.
- ◆ Frame new partitions on first floor.
- ◆ Permanently remove nonhistoric partitions on first floor.
- ◆ Remove deteriorated floor coverings on stairs, inspect central stair, and determine course of action.
- ◆ Remove all deteriorated first floor wall and ceiling finish materials, inspect structural members for deterioration, and repair and/or replace members in kind. Repair and/or replace all wall finish materials as noted in text of report.
- ◆ Restore original metal paneling and observation window in original garage and workshop areas.
- ◆ Remove damaged plasterboard in entry hall and replace with drywall, and insulate ceiling.
- ◆ Repair and/or replace plasterboard in kind in first floor stairway and paint, matching Keck's original design.
- ◆ Remove all second floor deteriorated wall and ceiling finish materials, inspect structural members for deterioration, and repair and/or replace members in kind. Repair and/or replace all wall finish materials as noted in text of report. See detailed statement in text concerning installation of fixed glass curtain wall system.
- ◆ Replace missing, cracked, or broken Carrara glass in second floor living room and bathroom in kind.
- ◆ Repair and/or replace plasterboard in second floor stairway and paint, matching Keck's original design.
- ◆ Frame and finish second floor drop ceiling with drywall, similar to Keck's original design.
- ◆ Repair original drop ceiling in second floor Master Bedroom.
- ◆ Remove all third floor deteriorated wall finish materials, inspect structural members for deterioration, and repair and/or replace members in kind. See detailed statement in text concerning installation of fixed glass curtain wall system.
- ◆ Remove nonhistoric first floor flooring material, investigate condition of any historic materials found, and repair and/or replace in kind. Repair and/or replace all materials as noted in text of report.
- ◆ Remove nonhistoric second floor flooring material, investigate condition of any historic materials found, and repair and/or replace in kind. Repair and/or replace all materials as noted in text of report.
- ◆ Remove nonhistoric third floor flooring material, investigate condition of any historic materials found, and repair and/or replace in kind. Repair and/or replace all materials as noted in text of report.
- ◆ Remove all nonhistoric first floor doors and replace, matching Keck's original design.
- ◆ Remove historic door from first floor entry hall closet, relocate to another opening as needed, and replace with an accordion door as per Keck's original design.
- ◆ Remove all nonhistoric second floor doors and replace, matching Keck's original design.
- ◆ Permanently remove first floor kitchen, including cabinets and equipment.
- ◆ Permanently remove nonhistoric first floor closets.

- ◆ Permanently remove nonhistoric second floor closet.
- ◆ Strip, clean, repair, and refinish existing second floor kitchen cabinets. Cabinets that are not original should be replaced with ones matching Keck's original design.
- ◆ Permanently remove nonhistoric gas log fireplace and prefabricated metal chimney.

Plumbing Systems

- ◆ Install new well (Section 106 compliance is in progress).
- ◆ Install new septic system (Section 106 compliance is in progress).
- ◆ Remove existing first floor $\frac{3}{4}$ bathroom and install new $\frac{3}{4}$ and full bathrooms.
- ◆ Repair and/or replace second floor bathroom and kitchen plumbing.

Heating and Air-conditioning Systems

- ◆ Remove nonhistoric baseboard heating units and existing boiler.
- ◆ Install forced air heating system, utilizing original ducts if possible. Clean, reline, repair and/or replace ducts in kind.
- ◆ Install air-conditioner, utilizing the ductwork for the forced air heating system.
- ◆ Install humidity control system.

Electrical Systems

- ◆ Relocate service to underground.
- ◆ Rewire and install new distribution panel. Additional outlets will be necessary.
- ◆ Replicate original fixtures in areas where fixed lighting was used. See details in text of report.
- ◆ Repair and/or replace indirect light fixtures in stair, retaining Keck's original design intent.
- ◆ Remove all other existing light fixtures, any surface mounted conduit, and doorbells. Replace light fixtures with replicas of original or ones that are appropriate to the architectural design.

Kitchen Appliances

- ◆ Strip, clean, and refinish the dishwasher and repair to operating condition.
- ◆ Utilize new contemporary fixtures that compliment the original interior design of the kitchen.

Furnishings

- ◆ Remove nonhistoric medicine cabinet in second floor bath, and reinstall original mirror. Replicate original glass shelf and lighting.

APPENDIX A – Context

Century of Progress Architectural District

A. HABS Large-Format Photographs

B. HABS Written Historical and Descriptive Data

APPENDIX B – Historical Data

House of Tomorrow

- A. HABS Large-Format Photographs
- B. HABS Written Historical and Descriptive Data
- C. Reduced Copies of Measured Drawings

APPENDIX C – National Register Nomination

APPENDIX D – Exhibits

- A. *House of Tomorrow America's First Glass House*
- B. *Glass as an Architectural Medium*
- C. *Keck & Keck*
- D. Oral History Interview with Joel Miller
- E. Oral History Interview with Mary Miller-Luxon
- F. Existing Condition Photographs
- G. Information provided by potential lessee, including:
Rehabilitation Philosophy

Exhibit A. *House of Tomorrow America's First Glass House*

Exhibit B. *Glass as an Architectural Medium*

Exhibit C. *Keck & Keck*

Exhibit D. Oral History Interview with Joel Miller

Exhibit E. Oral History Interview with Mary Miller-Luxon

Exhibit F. Existing Condition Photographs

Exhibit G. Information provided by potential lessee, including:
Rehabilitation Philosophy

REFERENCES

Kay D. Weeks and Anne E. Grimmer, The Secretary of the Interior's Standards for the Treatment of Historic Properties, (U.S. Department of the Interior, National Park Service, Cultural Resource Stewardship and Partnerships, Heritage Preservation Services, Washington, D.C., 1995).

Maria F. Ali, The Century of Progress Documentation Project (Washington, D.C.: Historic American Buildings Survey, Department of the Interior, 1994), HABS No. IN-239. Appendix A.

Maria F. Ali, The Century of Progress Documentation Project (Washington, D.C.: Historic American Buildings Survey, Department of the Interior, 1994), HABS No. IN-243. Appendix B.

National Register Nomination, National Register of Historic Places (National Park Service, Department of the Interior, October 1985), Appendix C.

General Management Plan, Indiana Dunes National Lakeshore (National Park Service, Department of the Interior, February 1980).

General Management Plan, Indiana Dunes National Lakeshore (National Park Service, Department of the Interior, August 1997).

Maintenance Division files, Indiana Dunes National Lakeshore.

Cultural Resource files, Resource Management Division, Indiana Dunes National Lakeshore.

Janice Slupski, 17 West Service Avenue: An Illustration of Dunes Area Recreational Development, (Indiana Dunes National Lakeshore, Department of the Interior, 1997).

Department of Agriculture, Soil Conservation Service, and Purdue University, Agricultural Experiment Station, Porter County Soil Survey, n.d.

B. R. Graham, House of Tomorrow, America's First Glass House, 1933.

A Century of Progress Homes and Furnishings, Dorothy Raley, Editor, 1934.

H. Ward Jandl, Essays by John A. Burns, AIA, and Michael J. Auer, Yesterday's Houses of Tomorrow, Innovative American Homes 1850 to 1950, n.d.

Glass As An Architectural Medium in 9 Small Modern Houses At A Century of Progress 1933-1934, author unknown, n.d.

Robert Boyce, Keck & Keck, Princeton Architectural Press, n.d.

Betty J. Blum, "Oral History Of William Keck, F.A.I.A.", conducted in August and September, 1990, compiled under the auspices of the Chicago Architects Oral History Project Ernest R. Graham Study Center for Architectural Drawings Department of Architecture The Art Institute of Chicago, 1991.

Narciso G. Menocal, Essay, "Keck & Keck, Architects", Department of Art History, University of Wisconsin-Madison, n.d.

Narciso G. Menocal, Foreword, Keck & Keck, Architects, Elvehjem Museum of Art University of Wisconsin-Madison, 1980.

George A. Larson and Jay Pridmore, Chicago Architecture and Design, n.d.

Ken Butti and John Perlin, A Golden Thread 2500 Years of Solar Architecture and Technology, n.d.

Nory Miller, "Fred Keck: A 'new' hit", Inland Architect, May 1976.

Joseph C. Folsom, "How to Enjoy This Week at the Fair Week Ending Sept. 30", Official World's Fair Weekly, 1933.

Catherine Collins, "In the '30's, Keck brothers saw the light, and solar came to Chicago", Chicago Tribune, Sunday, October 30, 1983.

Charles Storch, "2 brothers here designing solar buildings 40 years", Chicago Tribune, November 4, 1977.

"Chicagoing", Chicago Daily News, author unknown, n.d.

Oral History Interview with Joel Miller, February 19, 1999, Appendix D, Exhibit D.

Oral History Interview with Mary Miller-Luxen, March 8, 1999.

Interview with Maria F. Ali, July 1994.

Interview with Al O'Bright, March 16, 2001.

Reviewed But Not Utilized

A Century of Progress Exposition Chicago, 1933.

Official Guide Book of the Fair with Supplement, 1934.

Official Guide Book World's Fair, 1934.

Erik Mattie, World's Fairs, Princeton Architectural Press, n.d.

David Garrard Lowe, Lost Chicago, n.d.

Tony Hiss, Essay, Building Images Hedrick Blessing, n.d.

Lewis Mumford, Roots of Contemporary American Architecture 39 Essays from the Mid-Nineteenth Century to the Present, n.d.

Franz Schulze, Philip Johnson Life and Work, n.d.

The Architectural Photography of Hedrick Blessing, Robert A. Sobieszek, Editor, n.d.

Sidney K. Robinson, 1923-1993, The Postwar Modern House in Chicago, n.d.

“Keck & Keck Architects”, Inland Architect, July, 1965.

Prints & Photos, Chicago Historical Society.

James Christopher, “Architecture Series: Bibliography, Keck and Keck: A Bibliography”, Vance Bibliographies, April, 1984.

www.caia.umn.edu/chicago, topics of conversation.

www.geocities.com/PickelFence