Miller House and Garden Conservation Management Plan

PennPraxis

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ACKNOWLEDGEMENTS

Miller House and Garden is owned and cared for by Newfields. Tours at Miller House and Garden are made possible through the Columbus Area Visitors Center.

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This project is made possible with support from the Getty Foundation through its Keeping It Modern initiative.

Getty Foundation

Executive Summary

1. INTRODUCTION

The Miller House and Garden (MH&G) in Columbus, Indiana, is one of the most highly regarded examples of mid-century Modernism in the United States. It is considered the most refined, fully-realized work of Modern domestic architecture, interiors, and landscape, designed by Eero Saarinen (1910–1961), Alexander Girard (1907–1993), and Daniel Urban Kiley (1912–2004), respectively. In 2000, the Miller House and Garden became the first National Historic Landmark to receive this honor while still occupied by its original owners.

In 2009, the entire property, along with many of the original furnishings and artworks, were donated to the Indianapolis Museum of Art, Inc. now DBA Newfields (Newfields), by four of the five surviving Miller children. Newfields maintains ownership of the property and is financially responsible for its continued maintenance, supported in part through an endowed fund established by the Irwin-Sweeney-Miller Foundation.

The House and Garden were designed for durability. Nonetheless, they have required ongoing maintenance, investment and even adaptation by the Miller family and, more recently, Newfields. The site enjoys a very high level of integrity yet, nearly six decades after completion, some of the site's materials and systems are nearing the end of their functional service life. This represents both a significantly greater level of expenditure and an opportunity to consider enhancements for the sustainability of the site.

In 2017, the museum completed a 30-year Master Plan for its Indianapolis campus and the Miller House and Garden property in Columbus (led by Land Collective, with PennPraxis as the preservation subconsultant). The plan identified a clear need for deeper understanding of conservation priorities across its campus and specifically for development of management strategies to forward Newfields' stewardship of the MH&G as a vital part of the institution's permanent collection.

In 2019, Newfields partnered with PennPraxis to submit an application to the Getty Foundation's Keeping It Modern grant initiative. MH&G was one of ten projects selected by the Getty that year from around the world (Columbus' North Christian Church was also among them). All grants were designated for preparation of Conservation Management Plans, to be developed according to the values-centered logic set out in the Burra Charter (2013).

The goal of this CMP has been to develop an overarching conservation strategy for the house, interior, and grounds of the MH&G that balances strict preservation with adaptation, moves beyond short-term maintenance projects to plan, budget, and fundraise for cyclical maintenance and capital projects in the future. It will also ensure that the property remains relevant to diverse audiences and to Newfields' mission to "enrich lives through exceptional experiences with art and nature."

2. SCOPE & TEAM

The subject of the CMP has been the original 10-acre rectangular site purchased by the Millers and designed by Saarinen, Girard, and Kiley and their teams (2760 Highland Way). However, in proposing conservation and management measures, the entire 14-acre property owned by Newfields has been considered (including the support spaces at 2800 Riverside Drive). The project team included:

Penn Praxis: Preservation Planning/Landscape Preservation
Scattergood Design PC: Architect/Project Management
Watson & Henry Associates: Conservation Engineer
Building Conservation Associates: Finishes Conservation
DAVID RUBIN Land Collective: Landscape Architect

3. METHODOLOGY

The CMP process involved several stages of research, documentation, and analysis, resulting in a transparent decision-making process for the myriad conservation issues that arise in sites of this complexity and significance. These are presented in detail in the full report, with key findings summarized here.

3.1 Research: Understanding the Place

- A *timeline and summary of key events* associated with the design, construction and ongoing development of the site and its physical and temporal contexts was developed. The Archives, Indianapolis Museum of Art at Newfields (Newfields Archives) has been an invaluable resource.
- Throughout the project, *consultations and discussions with Newfields personnel* were a critical source of information and insight, including: Ben Wever, Site Manager; Jean-Luc Howell, Director of Historic Preservation; Katie Haigh, COO; and Shelley Selim, Curator of Design and Decorative Arts.
- *Base documentation* for the site and building was generated by the project team. The original Saarinen architectural floor plans, elevations and sections for the House were re-drawn in AutoCAD. A site plan mapping garden and support spaces was generated from remote-sensing data and field investigation. The digital version of the Base Documentation will be provided to Newfields for their use in maintaining a graphical record of past and future alterations and for conditions tracking.

Three sections on different aspects of Context frame key themes critical to understanding the site:

- *Context: The Building, Interiors and Garden* focuses on the extraordinary partnership between J. Irwin and Xenia S. Miller, Eero Saarinen and Kevin Roche, Alexander Girard, and Dan Kiley. Other aspects of importance included: the Miller House as a representation of the private home in the mid-twentieth century; the reciprocal relationships of the House and architectural photography, publishing and Mid-Century Modernism; and the role of J. Irwin Miller and the Cummins Foundation in the development of Columbus, Indiana.
- *Design and Construction History* outlines the sequence of decisions and events which led to the site's design, development, and evolution as it exists today. It focuses on the contributions of team members, the underlying design principles, challenges during the construction process, and the evolution of the site since the completion of construction, including transition to ownership by Newfields.
- *Management Context: Ownership, Regulations and Stakeholders* summarizes the management contexts shaped by Newfields' policies, as well as the regulatory and operational contexts of Columbus and perspectives of representative stakeholders.

3.2 Analysis: Values, Significance, Character-Defining Elements, and Risks

- *Values.* Values (cultural, aesthetic, historic) are the qualities of the site that distinguish it as a heritage place. The historic research, combined with interviews with key stakeholders at the Museum and within the Columbus community, generated a more complete understanding of the range of its values. Values associated with the Miller House and Garden include:

  -Historic: MH&G is an icon of Modernist design—the most fully realized example of a domestic environment envisioned by a collaborative team of highly accomplished Modernist designers. Its association with J. Irwin and Xenia S. Miller, the Miller family, and the Cummins Engine Company's philanthropic work in Columbus lends MH&G additional historic value in the realm of social and urban history. Also of importance is the way that new materials and assemblies, more typical of post-World War II corporate structures, were employed.

  -Aesthetic: MH&G is an integrated work of design that derives additional meaning and value when viewed holistically—as a total, expertly-realized and carefully-maintained work of architecture, interior design, and landscape architecture. It does not just bear the marks of the three great designers working on the project with their clients—the designs are carefully choreographed to connect while staying distinct, creating a whole experience that is greater than the sum of its parts.

  -Social: MH&G was not envisioned as a public landscape, although it has been used for public-facing events, such as First Lady Lady Bird Johnson's visit in 1967 and the Pritzker Prize jury in 1994. Now, MH&G yields social value to the

greater Columbus community by offering public tours and representing the design excellence that distinguishes the city and as the private domain of the visionaries who created this legacy for the Columbus community.

-Ecological: MH&G contributes to larger ecological systems and benefits by sustaining riverside buffers important in managing flooding of the Flatrock River. Its matrix of garden and service landscape elements support biodiversity and contribute to the resilience of the immediate area to environmental stresses.

- *Statement of Significance.* A more comprehensive assessment of values and significance notably expanded those established in the 2000 National Historic Landmark nomination to create a new statement of significance, as follows:

  The MH&G is an internationally significant work of design, recognized as a National Historic Landmark. The cultural significance of the MH&G draws most strongly on the excellence of its design, the involvement of a cadre of leading Modernist designers of the mid-twentieth century, and the role of its commissioning family (with their refined appreciation for Modernist art, design, and advocacy for Modernist corporate, civic and religious buildings in Columbus). In terms of total design, MH&G is among a handful of iconic works of domestic Modernism in the US.

  Saarinen, Kiley, and Girard each contributed their talent, however their collective work at MH&G constitutes a whole greater than the sum of its parts. While the design work of each is renowned in its own right, the integration and interplay of buildings, interiors, and landscapes represents an extraordinary level of mastery. The multi-layered, multi-faceted spatial integration of the different designers' work (achieved through spatial composition, choice of materials, shaping of light, organization of uses and flows) elevates the place beyond the distinctions of individual careers. Though Saarinen, Girard, and Kiley collaborated elsewhere, MH&G stands apart as a deeply refined and integrated example of Modernist architecture, landscape architecture, and interior design.

The cultural significance of MH&G also draws on the obvious but profound role of the Millers as clients and patrons. J. Irwin and Xenia S. Miller were full participants in the design process resulting in the original realization of the MH&G in 1957. And, in a sense, the Millers were lead designers for subsequent changes to MH&G as a home for five decades, then its transition to a museum space. The context of Cummins' patronage on Columbus' behalf—directed by J. Irwin Miller—adds public value to this intentionally private place.

Notwithstanding the widely recognized significance and representation of MH&G as an icon of Modern design—reinforced by the publication in popular media of iconic photographs and its relative inaccessibility to outsiders as a private residence, the place has evolved steadily and been subtly adapted over time as the needs of the family changed. Elements of the original design were replaced or adjusted, though never at a cost to the spatial structure, logic, and character of the original designs (and thus to the experience and integrity of the original design conception). The aesthetic qualities of the design imbue the site with distinct value to visitors. Experiences of light, texture, views, and movement through the spaces bring the design to all the senses, shift with the seasons, and open a window onto the Millers' family life and personal values.

The period of significance for MH&G, given the values assessed here, corresponds with the period of the Millers' tenure—from 1957 to 2008 (the year J. Irwin Miller, Xenia S. Miller, and their family moved in through Xenia S. Miller's death, leading to the change in ownership to Indianapolis Museum of Art the next year).

Finally, MH&G possesses social and ecological values that augment its cultural and historical significance as a work of design. Social value derives from its status and contemporary function as an historic site and civic asset in Columbus, Indiana, a place where significant design work and the

historical legacies of the Miller family are learned, celebrated and activated as assets for the tourism economy. The 14-acre property (the original 10-acre parcel and the added barn property) also possesses a measure of ecological value, in that the land includes riverbank, forest, open space and garden elements producing ecological, hydrological and biodiversity benefits shared across the wider geographical frames of the neighborhood and the Flatrock River watershed.

- *Understanding the Buildings, Landscape and Interiors and Collections:* Character-Defining Elements (CDEs) are the physical resources, patterns and experiences of the site that express its significance. In three separate chapters, aspects of the building, landscape and interiors or collections, at the Miller House and Garden are identified and documented with photographs. Histories of maintenance and change of these elements were summarized and current conditions were assessed. Most elements retain a high degree of integrity—that is, their character has been carefully stewarded throughout the Millers' occupation and beyond, and they continue to convey the site's cultural significance.

In terms of the entire site, some characteristics inform the holistic experience of the place:

- The organizing and unifying design principles: spatial structure of grids, alignments, and distinct indoor and outdoor spaces;
- Qualities of space and light created by the architectural and landscape architectural designs; and
- Clear and methodical separation of private and public spaces.

- *Assessing risks to the buildings, landscape, site and management framework.* A broader, more integrated assessment of risks identified issues critical to conserving the site and its elements, including risks related to the existing physical fabric and assemblies, to current uses and management of the site, and by future risks such as climate change.

3.3 Synthesis

- A *conservation philosophy* was developed for the entire site that reflects its values and significance on national and international levels — based on understanding of its history and integrity; identification of a hierarchy of significance for particular spaces, features, and relationships; and assessment of their relative tolerances for change. The philosophy is based on the assumption that the current Newfields' management context will continue, with refinements.
- General *policies* to conserve and sustain significance for buildings, landscapes and collections were suggested, as well as specific recommendations for conservation issues observed in the CDEs.

4. KEY FINDINGS

4.1 Building

The CDEs of the House relate to design ideas, spaces, materials, and building systems and assemblies:

Structural Form: The Grid

- Plinth and Flooring Systems
- Columns and Beams/Structural System
- Flat Roof and Extended Eaves
- Roof Drainage and Roof / Skylight Cavities
- Skylights and Architectural Definition with Natural and Artificial Lighting
- Opaque Wall Systems
- Transparent Wall Systems: Doors and Windows

Fixed Architectural Features

- Storage Systems
- Screen Walls: Privacy, Anticipation, and Curated Views
- Conversation Pit or "Lounge Pit"
- Living Area Fireplace
- Carport

Building Systems

- Heating, Ventilation, and Air Conditioning Systems
- Interior Environmental Management and Hygrothermal Performance of the Building Envelope
- Artificial Lighting Systems
- Entertainment Systems and Acoustics

Outbuildings

- Greenhouse/Office

4.2 Landscape

The principal CDEs of the landscape are identified as plantings, spatial relationships, and aesthetic effects. Specific elements include:

- Overall spatial structure and pattern, drawing on a variety of the specific design elements noted below
- Grids of uniform plantings: apples in East Lawn; crabapples and multiple smaller grids in the Adult Garden
- *Allées*: Entry Drive, Honey Locust, oaks in East Lawn, maples south of Meadow
- Buffer hedges: staggered arborvitae hedges for the exterior boundaries: single-thickness arborvitae and taxus hedges for some boundaries within the landscape
- Meadow: creating long, open views from House to forest edge
- Specimen trees on the margins of the House: beeches, magnolias
- Naturalistic edge of the riverbank forest
- Hardscape and sculptural elements: pavers; plinths; gates; fountain in Adult Garden

4.3 Collections

As noted in the Statement of Significance, the continuum of design at MH&G encompasses everything from its landscape to the remarkable interiors. Furniture, carpets and decorative objects are considered part of the museum's collection, while also essential to the way that MH&G is understood and experienced. The Miller family and Newfields have recognized this, preserving most of the furnishings in original locations and with original fabrics or reproductions of them. The section on Interiors and Collections outlines the history, significance and evolution of the interiors and furnishings, and identifies the following as character-defining elements (CDEs), typically by space:

- Key furniture and demountable lighting fixtures
- Window treatments
- Carpets and moveable floor treatments
- Fine and decorative artworks
- Color scheme

4.4 Site Risks

Flooding. The 2014 FEMA Flood Insurance Maps locate the eastern third of the Miller House and Garden site in the regulated floodway of the Flatrock River and the slope from the meadow to the plinth is located in the Special Flood Hazard Area. Although the Miller House and immediately surrounding garden spaces in the 500-year (0.2% Annual Chance) flood zone, their proximity to the identified flood limit is sobering, especially with climate change. Current identifiable risks to the Miller House and Garden from flooding of the Flatrock River are:

- Failure of the exterior air conditioning condenser located in the Special Flood Hazard Area east of the Barn. This would result in the inability to control relative humidity in the Miller House. This could result in rapid changes in temperature and relative humidity in the House and in fast germination of mold in a post storm/flood environment.
- Failure of the generator or generator cables located in or proximate to the Special Flood Hazard Area near the Barn.
- Floatation of the fuel storage tanks located in or proximate to the Special Flood Hazard Area near the Barn.
- Saturation of soils surrounding the House Basement.
- Flooding of the Basement and Collections Storage if floodwa-

ters reach the grade-level fresh air intake of the heating, ventilating and air conditioning system.

- Flooding of the Basement and Collections Storage if floodwaters reach the grade-level combustion air intake of the boiler.
- Delayed access to the site by law enforcement, rescue, or firefighting personnel stationed further south on Washington Street.
- Inadequate emergency response due to omission of the Miller House and Garden from the *2013 Columbus Flood Risk Management Plan*, updated in 2020.

Climate Change. The potential future impacts of climate change on the Miller House and Garden include increases in:

- Increased frequency and depth of flood events.
- Demands on overall energy infrastructure, especially electric utilities, and possible interruptions if capacity is not increased.
- Loads on storm-water management systems, including roofs, if the intensity of rain events increases.
- Severe wind events, with risks of damage from: uplift forces acting on roofing membranes, skylight covers and skylight glazing; high wind loads on sliding doors and window glazing; projectile damage to skylight, door and window glazing; increased soil particulates entering the house; and damage to trees, especially if soils are saturated.
- Severe hail events, with risks of damage from: impact damage to skylights and window glazing; impact and abrasion damage to the roofing membrane; blockage or clogging of roof drains; and damage to vegetation.
- Lightning strikes, which present the following risks: loss of electrical power to the site; loss of the back-up power generation system; damage to, or loss of, vital intrusion detection, fire detection, and information technology systems; and initiation of a building fire.

Fire. Although the Miller House has many characteristics that are beneficial with respect to fire, the House also has the following risks of damage from fire, smoke or water used in firefighting:

- The natural gas piping to the boilers and hot water heater in the basement may leak, resulting in a fire or explosion.
- The functionality of the electrical circuit breakers in the event of an electrical overload is unknown.
- Smoke from the initial stages of a fire may migrate into the skylight cavities, delaying smoke accumulation at the ceiling level and detection by the ceiling-mounted smoke detectors.
- Smoke from a fire on the first floor may be recirculated by the HVAC system without detection.
- Smoke from a basement fire may migrate to first floor spaces through HVAC ductwork due to lack of smoke dampers in the ducts.

Mechanical, Plumbing, and Electrical (MPE) Building Systems.

- The level of relative humidity that can be maintained in winter for collections conservation will be limited by the performance of the building envelope; if the interior relative humidity is too high, condensation/frost may occur within the wall and/or roof assemblies.
- The condition of HVAC ductwork under the floor slab is unknown. Corrosion of sheet metal portions of the duct may result in perforation, obstruction and/or entry of soil particles.
- The condition and functionality of the heating piping embedded in the floor slab is unknown. Corrosion may lead to leaks, floor slab moisture and/or cracking of the slab.
- The domestic water supply piping to the bathrooms and kitchen is configured as three loops under the floor slab. Although individual plumbing fixtures can be deactivated to reduce leak risks, the piping loops must remain in service if only one fixture is active. The condition of the piping under the slab is unknown and corrosion may lead to leaks, floor slab moisture and displacement of soil under the floor slab.

Site Management. Risks associated with management of the site include:

- Loss of key site personnel without a plan for development and training of a back-up or replacements.
- Persistent understaffing at the site will lead to failure to undertake and complete preventive conservation and maintenance

activities, resulting in shortened service life of architecturally significant materials or assemblies.

- Persistent understaffing at the site will prevent planning for conservation projects, resulting in underestimating of the future project scope and cost, and inadequate capital for execution.
- Failure to document and archive records of work undertaken at the Miller House and Garden will result in voids in the historic record and will undermine the ability of future stewards to make informed decisions about appropriate and effective treatments, repairs and replacements in the future.

4.5 Conservation Philosophy

Far from being an unchanging icon of Modern design, MH&G has changed and evolved over time, from the purposeful adaptations by the Miller family and repairs or changes related to failure of original design elements, to adaptations to convert the site from family home to museum. The conservation philosophy outlined in the CMP is consistent with the current mission of Newfields: "To enrich lives through exceptional experiences with art and nature." Many aspects of the conservation policies are also extensions of existing Newfields guidelines for the site. Sustainability resonates clearly with Newfields' mission, relating to all aspects of MH&G's care, operations, and public benefit: cultural and historical meanings, natural systems, educational functions, and financial resources.

Key principles of the Conservation Philosophy are:

- *Embrace adaptability of the kinds that improve performance or mitigate or reduce risk while preserving significance. Use a "tolerance for change" approach to guide conservation and adaptation.* The "tolerance for change" approach accepts that there are many instances where change will not adversely impact cultural significance and integrity, and can even strengthen them. The three design domains of the site—architecture, interiors, landscapes—each change at different rates, in different ways, according to different internal and external influences. Therefore, the "tolerances for change" in each domain will differ, as will appropriate treatment approaches, as noted below.
- *Integrate preventive conservation across all decisions related to all aspects of the care, management and interpretation of MH&G.* Preventive conservation differs from what is traditionally considered building maintenance by focusing on potential causes of deterioration and addressing them early, thus avoiding the tendency for short-term, ineffective solutions that ultimately result in loss of historic fabric and increased expenditures.

4.6 Building Conservation Policies

- Identify spaces with higher tolerance for change, such as non-visible elements and storage spaces. Spaces associated with service, such as the Maid's Suite, have a relatively low tolerance for change. Although these spaces have been altered, they may be important to interpreting the relationship of the family and the household staff.
- Balance environmental needs of the collections with preservation of the historic building.
- Monitor and document conditions of materials, assemblies and systems and their rates of change on a regular basis.
- Address causes rather than results or symptoms, by preceding treatments with investigations of causal factors.
- Ensure that conservation treatments recognize the systemic and interdependent nature of the House's character-defining elements. Engage experienced conservation professionals.
- Reduce the risk of fire at the Miller House through installation of a VESDA monitoring system, ideally when the roof is replaced.

Priority issues for the Buildings include:

- Roof replacement, skylight restoration, roof drainage and energy efficiency.
- Terrazzo, bedding mortar, structural slab, soils and drainage.
- Lateral separation of the slate cladding from the mortar bed and supporting concrete unit masonry walls.
- Coatings failure and corrosion of exposed steel at low points or

intersection with other assemblies.

- Replacement of integrated glazing units and ultraviolet filtering films in aluminum frames of windows and doors.
- Finish repair and replacement (finishes analysis).

4.7 Landscape Conservation Policies

- Continue replacement of plantings. Generally, plantings should be replaced at the scale of whole spatial feature or large portions thereof (a grid, bosque, allée, bed), not piecemeal/individual plants.
- Implement preventive conservation of key plants, including lightning protection for specimen trees.
- Repair hardscape features such as: Service Area pavement; concrete stair connecting south plaza of the honey locust allée to the maple allée along the south boundary; North Plinth of Honey Locust Allée; edging around pool arborvitae separating gravel from lawn
- Adapt/rehabilitate landscape elements with higher tolerance for change where benefits to sustainable management can be gained without compromising integrity/significance:
  - Strengthen the Riverbank
  - Reuse the sculpture platforms at both ends of the Honey Locust Allée
  - Strengthen northern boundary plantings to serve more effectively as a screen to the neighboring property
  - Utilize the Barn property, including the riverfront zone and parking/utility area
  - Explore the adaptation of the Meadow from its function as a monoculture lawn to a true meadow.

Priority issues for the Landscape include:

- Installing lightning protection for specimen trees
- Replacing deteriorated elements of the Arborvitae boundary hedges
- Replacing crabapple grids in Adult Garden with redbuds
- Repairing north plinth of the Honey Locust Allée
- Ensuring full staffing for ongoing maintenance.

4.8 Interiors and Collections

Develop a collections care policy that is appropriate for the Miller House and Gardens. While there may be practical limits for the interior relative humidity level that can be safely maintained in the Miller House during winter without damage to the historic building fabric, much can be done to mitigate risks to collections without compromising the building. However, this cannot be determined until existing conditions, such as temperature and moisture data for the cavities of the roof/ceiling assembly and the design intent and effect of the turbine vents, have been collected and assessed. Rotating collections objects on display, and storage during periods when the building is closed to the public, are some appropriate options for finding the balance necessary for long-term conservation of the character-defining features or objects. Additionally, surveying the condition of the elements of the interior and the collection will be critical in developing a sustainable and site-specific collections care policy for MH&G.

4.9 Site Management Policies

- Prepare a site-specific, stand-alone *Emergency Preparedness and Response Plan* for the Miller House and Garden.
- Develop *policies specific to the needs of the Miller House for documentation of existing conditions* and conservation management/projects, including:
  - Comprehensive and up-to-date site survey
  - As-built drawings and photographs for existing buildings
  - Periodic survey of landscape plantings
  - Documentation and assessment of concealed systems
  - Research on Barn and Managers House
  - Past and Future Treatments
- Reinforce *Site Management and Construction Management Best Practices*
- Commission a *Heritage Reinvestment Plan and Reserve Fund* to ensure that endowments include appropriate levels of funding for ongoing operations and stewardship, culminating in development of a Reserve Fund.

Fig 0.1 Aerial view via Google Earth. Date: October 2019. Credit: Google Earth

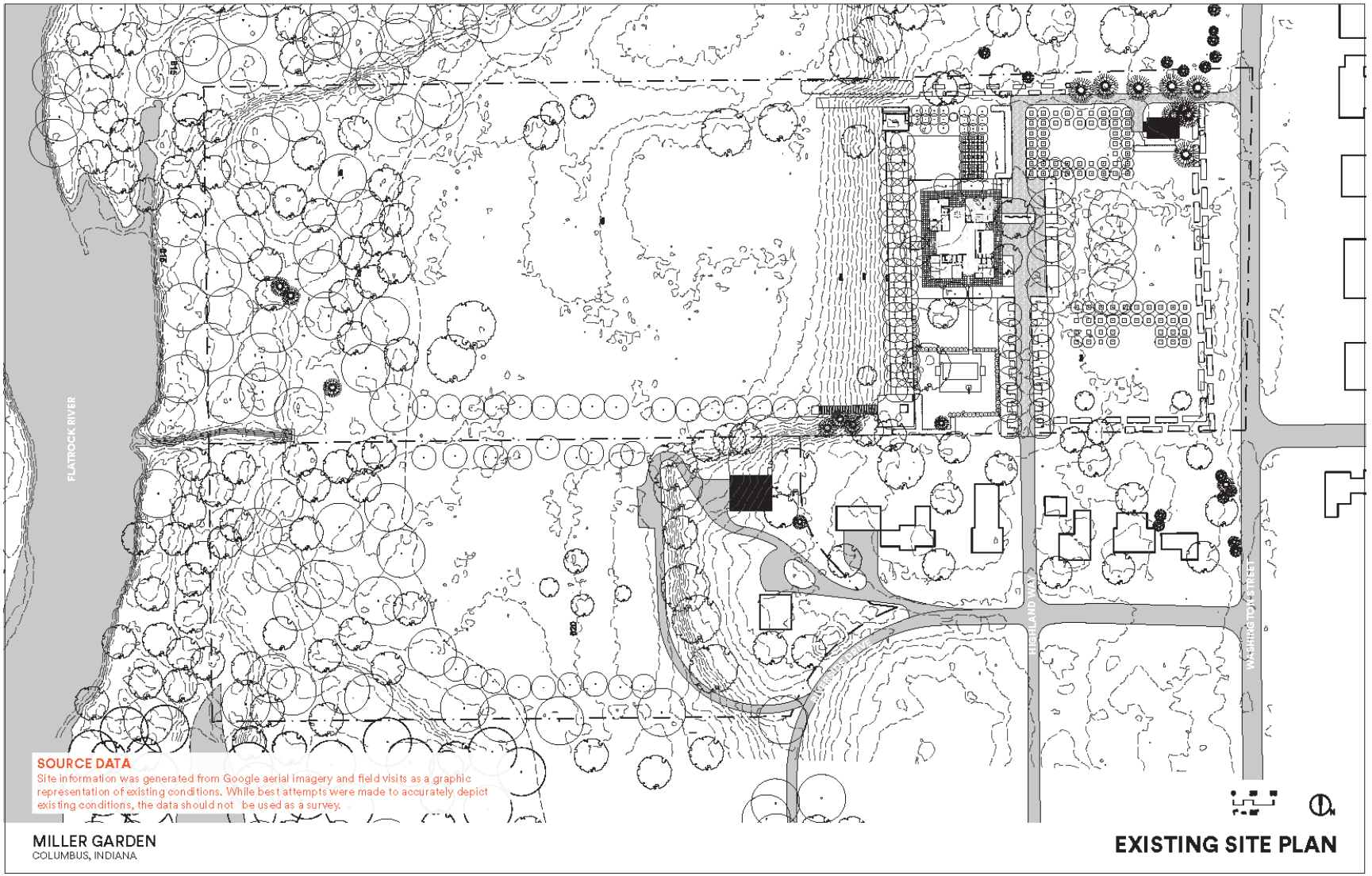

Fig. 0.2 Existing conditions plan. Date: 2021. Photo credit: PennPraxis/DAVID RUBIN LandCollective.

1
Introduction: Goals and Methodology

1 GOALS AND METHODOLOGY

1.1 INTRODUCTION

The Miller House and Garden (MH&G) in Columbus, Indiana, is one of the most highly regarded examples of Mid-Century Modernism in the United States. It is considered the most refined, fully-realized work of Modern domestic architecture, interiors and landscape, designed by Eero Saarinen (1910–1961), Alexander Girard (1907–1993), and Daniel Urban Kiley (1912–2004), respectively. In 2000, the Miller House and Garden became the first National Historic Landmark to receive this honor while still occupied by its original owners.

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MH&G was one of ten projects selected by the Getty that year from around the world (Columbus' North Christian Church was also among them). All grants were designated for preparation of Conservation Management Plans, to be developed according to the values-centered logic set out in the Burra Charter (2013). Two members of the MH&G CMP team—Jean-Luc Howell and Pamela Hawkes—participated in a workshop devoted to best practices sponsored by the Getty Foundation in September 2019.

1.2 GOALS

The goal of this CMP has been to develop an overarching conservation strategy for the house, interior, and grounds of the MH&G that moves beyond short-term maintenance projects to plan, budget, and fundraise for cyclical maintenance and capital projects in the future. It will also ensure that the property remains relevant to diverse audiences and to Newfields' mission to "enrich lives through exceptional experiences with art and nature."[1]

1.3 SCOPE AND METHODOLOGY

The subject of the CMP has been the original 10-acre rectangular site purchased by the Millers and designed by Saarinen, Girard, and Kiley and their teams (2760 Highland Way). However, in proposing conservation and management measures, the entire 14-acre property owned by Newfields has been considered, including the support spaces at 2800 Riverside Drive.

The CMP process involved several stages of research, documentation, and analysis, resulting in a transparent decision-making process for the myriad conservation issues that arise in sites of this complexity and significance. These are presented in detail in the sections which follow this one. The objectives, methodology and activities associated with the MH&G CMP are outlined in this sub-section, followed by a summary of key findings and recommendations.

Note on Terms and Abbreviations. Throughout the report, the following abbreviations are used:

- MH&G for Miller House and Garden
- Newfields for the Indianapolis Museum of Art at Newfields
- Newfields Archives for The Archives, Indianapolis Museum of Art at Newfields
- JIM for J. Irwin Miller
- XSM for Xenia Miller
- CMP for Conservation Management Plan

Research: Understanding the Place

- A timeline and summary of key events associated with the design, construction and ongoing development of the site and its physical and temporal contexts was developed. The Archives, Indianapolis Museum of Art at Newfields (Newfields Archives) has been an invaluable resource comprising 335 linear feet of materials, of which 9,442 items were digitized and made available online in 2012 through a grant from the National Endowment for the Humanities. This allowed for remote access by the CMP team after the COVID-19 pandemic arose in early 2020, just as work started. Our timeline of the site's evolution worked from a base already created by Newfields staff.
- Throughout the project, consultations and discussions with Newfields personnel were a critical source of information and insight. Archival information was supplemented by knowledgeable staff, including: Ben Wever, Site Manager; Jean-Luc Howell, Director of Historic Preservation; Katie Haigh, COO; and Shelley Selim, Curator of Design and Decorative Arts. Selim contributed the section on the Interiors as well as context information in other sections related to Alexander Girard, the Miller family's life in the House and its transfer to Newfields.
- Base documentation for the site and building on which to record, compare, assess, and monitor current and future conditions was generated by the project team. The original Saarinen architectural floor plans, elevations and sections for the House were re-drawn in AutoCAD (Appendix D). A site plan mapping garden and support spaces was generated from remote-sensing data and field investigation.

Three sections on different aspects of Context frame key themes critical to understanding the site.

- **Context: Design Team and Project Impact** focuses on the extraordinary partnership between J. Irwin and Xenia S. Miller, Eero Saarinen and Kevin Roche, Alexander Girard and Dan Kiley. Other aspects of importance included: the Miller House as a representation of the private home in the mid-twentieth century; the reciprocal relationships of the House and architectural photography, publishing and Mid-Century Modernism; and the role of J. Irwin Miller and the Cummins Foundation in the development of Columbus, Indiana.
- **Design and Construction History** outlines the sequence of decisions and events which led to the site as it exists today. It focuses on the contributions of team members, the design principles and integration of architecture, interiors, and landscape design; challenges during the construction process; and the evolution of the site since the completion of construction.
- **Management Context: Ownership, Regulations and Stakeholders** summarizes the management contexts shaped by Newfields' policies, as well as the regulatory and operational contexts of Columbus and perspectives of representative stakeholders.

Analysis: Values, Assets, and Needs

- **Values**. Values (cultural, aesthetic, historic) are the qualities of the site that distinguish it as a heritage place. The historic research, combined with interviews with key stakeholders at the Museum and within the Columbus community, generated a more complete understanding of the range of its values.
- **Statement of Significance**. This more comprehensive assessment of values and significance greatly expanded those established in the 2000 National Historic Landmark nomination.
- **Character-Defining Elements (CDEs)**. CDEs are the physical resources, patterns and experiences of the site that express its significance. Aspects of the building, collections, and landscape at the MH&G were identified, documented with photographs and described. Histories of maintenance and change of these elements were summarized and current conditions were assessed.
- **Assess risks associated with buildings, interiors/collections, landscape, site and management framework**. A broader, more integrated assessment of risks was made to identify issues critical to conserving the site and its elements, including risks related to the existing physical fabric and assemblies, to current uses and management of the site, and by future risks such as climate change.

Site investigations to support this analysis were carried out in phases. Randall Mason and Molly Lester had visited the site in 2017 for the

Master Plan; Michael Henry made a one-day visit to identify key conservation issues as part of preparations for the grant application in the winter of 2019. A week-long visit by all team members was deferred until June 2021 because of COVID-related travel restrictions; recommendations associated with planning for roof replacement were expedited in the fall of 2020 using images provided by the Miller House staff.

Synthesis

- A **conservation philosophy** was developed for the entire site that reflects its values and significance on national and international levels — based on understanding of its history and integrity; identification of a hierarchy of significance for particular spaces, features, and relationships; and assessment of their relative tolerances for change.
- General **policies** to conserve and sustain significance for buildings, collections and landscape were suggested, as well as specific recommendations for conservation issues observed in the CDEs.

Although all sections were reviewed and edited by the entire team, principal authorship for sections is as follows:

Executive Summary: Pamela Hawkes

1: Pamela Hawkes

2. Shelley Selim (Alexander Girard), Randall Mason & Elizabeth Sexton (Dan Kiley), Pamela Hawkes (all other sections)

3. Randall Mason (Landscape), Shelley Selim (Life in the Miller House, A Private Home Made Public), Pamela Hawkes (all other sections)

4. Randall Mason

5. Randall Mason

6. Michael Henry (Columns, Roof, Skylights, Building Systems), Pamela Hawkes (all other sections)

7. Randall Mason

8. Shelley Selim

9. Michael Henry

10. Randall Mason (Goals, Conservation Policy, Landscape Policy), Pamela Hawkes & Henry (Building Policy, Collection Policy), Pamela Hawkes, Michael Henry & Randall Mason (Management Policy)

1.4 AUTHORSHIP

2
Context: Design Team and Project Impact

2 CONTEXT: DESIGN TEAM AND PROJECT IMPACT

2.1 CLIENTS: JOSEPH IRWIN AND XENIA SIMONS MILLER

J. Irwin Miller (JIM) and Xenia Simons Miller (XSM) are briefly mentioned in the National Historic Landmark (NHL) designation for the Miller House and Garden (MH&G), yet clearly, the site would not have existed without them. The property is significant as an expression of their remarkable values and lifestyle, as well as their impact on the community and the country. The lives and accomplishments of J. Irwin and Xenia Miller and other members of the Design Team have been documented in a number of biographies and through excellent collections of their papers at both the Indiana Historical Society and the Newfields Archives.[1] This section will focus on their accomplishments as they provide context for the evolution and significance of the Miller House.

Joseph Irwin Miller (1909–2004)

Joseph Irwin Miller was born in Columbus, Indiana, into a family that had been town leaders in commerce, banking and politics since the late nineteenth century.[2] After graduating from Yale and Oxford Universities, JIM joined one of several family businesses—Cummins Engine Company. The family had been bankrolling the company since its founding in 1919 to develop diesel technology invented by Clessie Cummins, at one time the Millers' chauffeur. JIM returned from active duty in the Pacific after the death of his great-uncle, William G. Irwin, in 1944, to serve as executive vice president. He became president in 1947, then chairman when the company went public in 1951, resigning 25 years later in 1977.[3] Under JIM's leadership, by 1967 Cummins Engine Company had grown "to control half of the domestic market in diesel engines for trucks" and by 1975 the company had "20,000 employees and sales of $832 million."[4]

Son William Irwin ("Will") Miller explained that his father "felt that business should be the instrument of social reform and change," and that value was expressed in myriad ways throughout his career.[5] In the 1930s, at the height of anti-union sentiment in the U.S.nited States, JIM actively supported creation of a union at the plant. In the 1960s, he worked behind the scenes to assure passage of the Civil Rights Act; in the 1970s, he chose to close the highly profitable Cummins Engine plant in South Africa rather than work within a culture of apartheid. In 2000, he voiced support for the company's decision to extend benefits to domestic partners of employees, stating long-standing beliefs that "the best talent has never come from one [single] segment of the population, whether defined by race, gender or other aspects of a person's background."[6] J. Irwin Miller also made significant impact through his volunteer activities. As founder and later the first lay president of the National Council of Churches, he helped plan the 1963 March on Washington with Martin Luther King, Jr.[7] An *Esquire* article in 1967 noted, "During his tenure as a trustee, the Ford Foundation expanded its contributions to anti-poverty, community organization and civil rights projects. Yale University, of which he is a life trustee, has played an important role in redeveloping New Haven through urban renewal, and in contributing personnel to such programs as legal aid for the poor."[8]

The *Esquire* article, titled "Is It Too Late for a Man of Honesty, High Purpose and Intelligence to Be Elected President of Tthe United States in 1968?" also enumerated his political activities on a local and national level.[9] A registered Republican who had supported Democrat John Lindsay for Mayor of New York, he was appointed by President Lyndon Johnson to chair "a commission which recommended liberalization of East-West trade, …another commission studying health, manpower and services, …one studying the post office and another the role of big business in rebuilding the slums."[10] With his characteristic humor and modesty, he told the reporter, "'I'm afraid, the President has a very short list [of leaders to choose from].'" [11]

JIM contributed money as well as time and influence to causes locally and nationally. As Will Miller recalled, "'He believed that whatever wealth accumulates in your particular possession in a capitalist society is best conceived of as a stewardship. You did not alone create it.'"[12]

Often described as a Renaissance man, JIM was an accomplished amateur musician and, in later life, a prominent art collector. Architecture became both a passion and an expression of his spiritual values. As he once noted, "'I was always interested in architecture. In school I took...nine years of Greek and Latin, and I got very caught up in classical history of all kinds, especially Greek classical architecture. I really knew a good many dimensions of the Parthenon and names of the architects."[13] As an undergraduate at Yale, he claimed, "The only thing we were interested in was architecture. ...Yale was building its traditional colleges but we undergraduates knew about the modern architecture in Europe."[14]

Miller had an opportunity to expand his interest and impact in architecture through the Cummins Foundation, (see Section 2.76). The press repeatedly labeled J. Irwin Miller a "Patron of Modern Architecture," yet he flatly rejected that role:

> I prefer to be called a client for several reasons. I think patron implies an unequal relationship, and I don't believe you can get a good result unless the architect/client relationship is one of peers, in which each challenges the other. Patronage also is linked to a preoccupation with image. I think an absolutely disreputable reason for attention to architecture is image. If image has any meaning at all it is as a byproduct of doing a good job; it is not something you ever seek.[15]

In mid-twentieth century United States, corporate and cultural clients and donors like the Millers "grappled with the specter of elitism, which seemed to call into question patrons' dedication to American populist values of egalitarianism and democracy."[16] In response, they turned to Modern architecture to express "newness, progressiveness, and 'freedom.'"[17] JIM, of course, took this attitude even further, bringing the best of Modern design to the Columbus community. Son Will confirmed that "the close personal friendship developed with Eero Saarinen was the single greatest influence on Irwin Miller's interest in the importance of the built environment."[18]

Xenia Simons Miller (1917–2008)

Xenia Simons Miller was born near Columbus and moved there during childhood, "the daughter of the owner of a furniture manufacturing business that failed in the Great Depression."[19] After excelling in high school, she received a loan to attend Indiana Business College in Indianapolis from JIM's mother Nettie Sweeney Miller, whom she had met as a member of Tabernacle Church of Christ. After a job at the Irwin Union Bank, she became a buyer in the purchasing department at Cummins Engine Company, where she learned to read blueprints and met her future husband and learned to read blueprints.[20] As noted in the excellent biography, *Xenia Simons Miller: Prairie Modernist*, by Connie Zeigler, XSM had particularly enjoyed her high school classes in art and thus came to share her husband's enthusiasm for contemporary architecture.[21]

She was a partner with JIM in the planning of their first two homes—Llanrwst, the summer home in Canada and the new home in Indianapolis. Lily Saarinen and Susan Girard were talented designers involved in their husbands' practices and also participated in the planning sessions for Llanrwst. Initially, much of XSM's communication with the design team came through the wives or JIM.[22] In developing the interiors of the Miller House, however JIM confirmed that "Sandro (Girard) worked with Xenia on the color scheme. It was one seamless conversation."[23]

Girard honed Xenia Miller's eye through visits to shops in New York and encouraged her enthusiasm for collecting folk art from around the world—a passion whose fruits were beautifully-displayed in the storage wall that dominates the Miller House living area. The design and construction of the house coincided with the growing network of international marketing and production for Cummins Engine Company and later accounts remarked that "her discerning eye for great art, grounded in her love of beauty and color, was largely self-taught in the great museums and galleries of the world."[24] Purchases made when she accompanied JIM on business trips ultimately provided furnished the Miller House interiors and gardens with a world-class collection of 20th twentieth-century art which, at the time of its sale in 2008, was identified as "the most important and valuable collection of Impressionist and Modern art ever offered by Christie's in Europe."[25]

As the Christie's sale catalog related:

> Xenia Miller [like Irwin] believed that the arts were among the most civilizing influences of life. With an unerring eye for color and design, she identified and bought the works of some of the greatest artists of the 20th century well before they were famous. She, with her husband, commissioned major works by Henry Moore, Jean Tinguely, and Dale Chihuly for public projects in their hometown and donated them to the city. She chaired the Indiana Arts Commission and was the first person to chair the board of the Indiana Endowment for the Arts. It was her vision and persistence that created the Indianapolis Museum of Art—Columbus Gallery, one of the first branch galleries of a major museum in the country.[26]

2.2 DESIGN TEAM

Eero Saarinen (1910–1961)

Eero Saarinen was born in Finland and moved to the United States with his family in 1923. His father, Eliel Saarinen, had an active career in Finland before a second-place finish in the 1923 Chicago Tribune Tower competition provided an impetus to relocate to the United States. After being commissioned in 1925 to design the campus of Cranbrook Academy in Bloomfield Hills, Michigan, modelled after the Bauhaus, the elder Saarinen served as its president from 1932–1948.[27] Eero Saarinen studied before graduated from the Yale School of Architecture in 1934 and practiced with his father from 1937 until the latter's death in 1950. Major projects completed together included Kleinhans Music Hall (1938) in Buffalo, New York; Crow Island School (1939) in Winnetka, Illinois; and the General Motors Technical Center (1957) in Warren, Michigan (largely completed by Eero).[28]

Fig. 2.1.1 J. Irwin Miller and Xenia Simons Miller. Date: 1952. Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

Fig. 2.1.2 Alexander Girard and Xenia Simons Miller. Date: 1950s. Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

Eero Saarinen established his own national reputation as a designer after bettering 172 entries, including one by his father, in the competition for the Jefferson National Expansion Memorial in St. Louis, now known as the Gateway Arch, in 1948. Girard and Kiley were members of his winning team.[29] Other significant work in his brief career included:

- Kresge Auditorium, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1955
- MIT Chapel, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1955
- U.S. Embassy, London, England, 1956
- U.S. Embassy, Oslo, Norway, 1956
- John Deere Administration Center, Moline, Illinois, 1957
- David S. Ingalls Rink, Yale University, New Haven, Connecticut, 1958
- TWA Terminal, John F. Kennedy Airport, Queens, New York, 1960
- Dulles Airport, Chantilly, Virginia, 1963
- Vivian Beaumont Theater, Lincoln Center for the Performing Arts, New York City, New York, 1965[30]

Saarinen's furniture designs were as revolutionary and popular as the buildings, and more readily accessible. In 1940, he and Charles Eames won first prize in the Museum of Modern Art's "Organic Design in Home Furnishings" competition, and their work exhibited in the 1941 exhibition that followed.[31]

Saarinen's body of work is even more remarkable given his death at age 51, when most architects are entering their most fruitful and mature periods of work. In his lifetime, Saarinen was featured on the cover of *Time* magazine (1956) and ranked with Gordon Bunshaft, Philip Johnson, and Mies van der Rohe as one of "Four Architects Helping to Change the Look of America" in *Vogue* in 1955.[32] The distinctive, sculptural forms of the TWA Terminal and Dulles Airport captured the American imagination and numerous design awards, but garnered scorn from contemporary critics. Allan Temko, critic for the *San Francisco Chronicle* from 1961 to 1993, published a critique of Saarinen's work in 1962, deeming elements of certain projects as "arbitrary" and "subjective."[33] Even twenty years later, Peter Papademetriou complained that the work "'never evolved into a single aesthetic, nor did it evidence the 'signature' consistency of other artists and architects'"—as if a consistent form was a criterion for great design.[34]

Ultimately, Saarinen's ability to give unique form to each project was recognized as a strength by his corporate clients. In a 1953 interview in the *New York Times*, Saarinen said "A better name for architect is form-giver and until his death in 1950, when I started to create my own form, I worked within the form of my father."[35] Years later, architectural historian Stephen Fox explained: [Philip] Johnson, Saarinen, and Edward Larrabee Barnes…functioned as *form givers*—a term popular in American architectural discourse during the late 1950s and early 1960s—not only in the obvious architectural sense of producing distinctive buildings but also because they were cultural arbiters whose advice, judgment, and instruction were sought by patrons eager to acquire the prestige and polish of metropolitan modernism.[36]

Fox also noted, "What made these architects unusual were the relationships they developed with their patrons, which extended beyond individual architectural commissions."[37] According to architectural historian Jayne Merkel, JIM was "a client like no other."[38] Saarinen was ambivalent about the house as a design problem, declaring: "The house isn't really architecture. I think it's been too much overblown and much too important. … Lots of civilizations have lived with the house being an unimportant part, an anonymous part of architecture."[39] Saarinen designed only four new private homes after his father's death, and two of those were for the Millers, underscoring the significance of their relationship.[40] By the turn of the twenty-first century, efforts were underway to address the fact that "there had never been a retrospective of the life and work of Eero Saarinen, one of the most prolific and important architects of the twentieth century."[41] Almost 50 years after his death, his work and life gained new attention and appreciation through a series of exhibits, symposia, and monographs, as well as designation of many works as National Historic Landmarks.[42]

Kevin Roche (1922–2019)

In addition to the built work, a significant aspect of Saarinen's legacy was training the large cadre of designers who worked in the office and later became influential in their own right. Kevin Roche, Saarinen's principal design associate, was among the best known. Roche joined

Saarinen's office in 1950, as work on the General Motors Technical Center project was underway, and later was intimately involved with all aspects of the Miller House project, recognized as associate in contemporary publications.[43] He later related:

> Eero was very, very bright, and he always wanted to think through the origins of any problem. You never learned that in architecture school. More pragmatically, you never learned the things most fundamental to him——that a building is only for people, at a specific moment in time, and that it has to evolve and have the capacity to change its culture and be exciting to live in, as well as doing all the usual, functional things like keeping the weather out. Working with Eero was in this sense a tremendous lesson for me. Forget about all the theories of architecture. Designing something that people occupy is the architect's job. There was nothing that Eero said or did that even in some obscure way didn't have something to do with a project we were developing. He also never once stopped working.[44]

After Saarinen's sudden death, Kevin Roche and John Dinkeloo took over management of the office, which numbered 160 employees, and completed the ten outstanding commissions. Five years later, in 1966, once the Saarinen projects were complete and they had won work in their own right, they renamed the office Kevin Roche John Dinkeloo Associates (KRJD) and established their own reputation as "the most aesthetically daring and innovative American firm of architects now working in the realm of governmental, educational and corporate clients."[45] The firm completed a series of projects for Cummins Enigne Company and Columbus:

- U.S. Post Office (1969);
- Irwin Office Building Arcade (1972);
- Midrange Engine Plant (1973); and
- Corporate Office Building and Headquarters (1983 and 1985).

Other significant work included the Ford Foundation Headquarters in New York (1968); the Oakland Museum in California (1966); and numerous additions to the Metropolitan Museum (2003, 2008, 2011). Among the honors given to Roche was the Pritzker Prize (1982) and the AIA Gold Medal (1993).[46]

Kevin Roche John Dinkeloo Associates, and Roche in particular, continued its relationship with the Millers and the MH&G long after the house was completed. Like Saarinen, Roche rarely took on private home projects.[47] Nonetheless, he was the principal contact for renovations to the Miller House after completion (see Section 3.6), re-built Llanrwst aterafter a fire (see Section 2.3) and designed a winter home for the Millers at Hobe Sound, Florida (1982). JIM wrote the introduction to the firm's 1977 monograph, his association with Roche thus adding another layer of significance to the Miller House and Garden.[48]

Alexander Girard (1907-1994)

Alexander Girard was one of America's most significant post-war designers, celebrated today for an unorthodox approach to Modern design that was characterized by bold color combinations, theatrical imagination, and whimsy. He was as much a designer as he was an accumulator and curator of folk art objects from around the world, and his collections of artworks, papers, textiles, toys, natural objects, and other ephemera inspired nearly everything he produced. While he designed exhibitions, restaurants, private homes, and showrooms, he is perhaps best known for his textile designs at Herman Miller Furniture Company, where he worked alongside close friends Charles and Ray Eames and George Nelson to produce innovative and iconic products that helped to define American mid-century Modernism.

Girard was born in New York City to an American mother and an Italian father, who came from a family of international antique dealers. He was raised in Florence, Italy, and his childhood as well as his father's profession spawned his enduring love of collecting and his appreciation for classical forms. He studied architecture at the Architectural Association School of Architecture (AA) in London and the Royal School of Architecture in Rome, graduating with honors in 1929.[49]

After returning to New York in 1932 to pursue a career as a furnishings and interior designer, he met and married Susan W. J. Needham before ultimately relocating to Detroit, Michigan, in 1937.[50] His new wife's family was wealthy and well-connected, providing

Girard with a notable degree of privilege in choosing design projects and clients throughout his career. After the move to Michigan, Girard encountered Charles and Ray Eames and Eero Saarinen, a cadre of young, influential designers who were studying and teaching at Cranbrook Academy of Art in nearby Bloomfield Hills, Michigan. While pursuing contracts with various automotive companies, industrial design firms, and private individuals—as well as designing his own home in Grosse Pointe—Girard began working collaboratively with Saarinen. They produced a textile design with Charles Eames for a competition at the Museum of Modern Art in 1946, and Girard designed an unrealized mural for Saarinen's St. Louis Jefferson National Expansion Memorial project in 1948. In 1951, with the support of Charles Eames and George Nelson, Girard was hired as the director of Herman Miller Furniture Company's newly formed Textiles Division, which he oversaw for over twenty years. In 1953, he, Susan, and their two children relocated to Santa Fe, New Mexico, where his design firm would be based for the remainder of his career.[51]

The Miller Family—and by extension the city of Columbus—were Girard's most devoted clients. He was introduced to JIM and XSM through Saarinen, and his inaugural project for the family was designing the interiors for Llanrwst, a vacation cottage in Muskoka, Canada (1952). Shortly after its completion, the Millers engaged Girard and Saarinen to design the Miller House (1957), and Girard was hired again by JIM to design his personal office on Washington Street (1962), interior renovations of the Cummins Office (1964), and the Irwin Management Offices (1972) in Columbus. In 1961, the Downtown Development Agency of Columbus enlisted the designer to create a unified vision and color scheme for the storefront businesses on Washington Street.[52]

From the 1950s through the 1970s, Girard's design projects were varied. In addition to over three hundred textiles for Herman Miller, other important projects included:

- Girard Residence, Grosse Pointe, Michigan, 1948 (architect and interior designer)
- *For Modern Living* exhibition, Detroit Institute of Arts, Detroit, Michigan, 1949 (curator and organizer)
- McLucas House, Grosse Point, Michigan, 1950 (architect)
- Rieveschl Residence, Grosse Point, Michigan, 1951 (architect)
- Girard Residence, Santa Fe, New Mexico, 1953 (interior designer)
- *Good Design* exhibition, Merchandise Mart, Illinois, 1953 (designer)
- *Textiles and Ornamental Arts of India* exhibition, Museum of Modern Art, New York, New York, 1955 (designer)
- La Fonda del Sol restaurant, New York, New York, 1960 (interior designer)
- Textiles & Objects Shop, New York, New York, 1961 (designer and buyer)
- Corporate Identity for Braniff International Airlines, 1965 (designer)
- L'Etoile restaurant, New York, New York, 1966 (interior designer)
- The Girard Group furniture line for Herman Miller, 1967 (designer)
- *The Magic of the People* exhibition, HemisFair, San Antonio, Texas, 1968 (curator and designer)
- *Multiple Visions: A Common Bond* exhibition, Museum of International Folk Art, Santa Fe, New Mexico, 1982 (designer)

Throughout Girard's diverse body of work in a career that spanned forty years, he developed a style of controlled maximalism that was often in philosophical conflict with the Modernist buildings it inhabited, yet was beloved by his clients. As his friend and fellow textile designer Jack Lenor Larsen wrote:

> All through the four decades when architectural Catholicism has been measured by the omission of any aspect which is not intellectual, when serious environmental design has not corrected people's alienation from their senses and often sensibilities, but has made a headstrong, headlong plunge into judgmental intellectualism, Girard was first and loudest in suggesting the alternative of lively personal expression.[53]

Girard's inclination toward color, texture, and whimsy perfectly dovetailed with his passion for collecting international folk art—by the time he donated his collection to the State of New Mexico in 1978, it had grown to over 100,000 objects. Personally selected folk art objects frequently populated the homes, exhibitions, and businesses he designed, and his practice was informed by their many colors, shapes, and patterns. Aside from the designer's Santa Fe home—which has been sold and no longer contains its furnishings or collections—the Miller House is the greatest example of Girard's thoughtful integration of Modern design and folk art.

Dan Kiley (1912–2004)

Dan Kiley was one the most important Modern landscape architects of the twentieth century. He practiced for over 60 years, creating residential and institutional landscape designs that, as his colleague Gregg Bleam aptly described, "are known for their elegant simplicity, geometric rigor, and poetic use of plants."[57]

Daniel Urban Kiley was born on September 2, 1912, in Boston, Massachusetts. He spent his childhood split between his family's home in Roxbury Highlands, Boston, and his grandparents' farm near the White Mountains of New Hampshire.[58] During secondary school, Kiley's job as a caddy exposed him to golf-course design and encouraged him to begin reading about landscape architecture.[59] Between 1932 and 1938, Kiley worked for leading landscape architect Warren Manning. Of this experience, Kiley noted, "From Manning, I gained extensive first-hand knowledge of plants (not spatial composition); it was the technical expertise that subsequently allowed me to develop an apt design sense."[60] In 1936, Kiley enrolled part-time in the landscape architecture program at the Graduate School of Design at Harvard University. With two of his classmates, James Rose and Garrett Eckbo, Kiley pushed against the Beaux-Arts teachings of the department, arguing for a new landscape architecture, one that aligned with emerging themes in Modern art and architecture.[61]

Kiley left Harvard without a degree in 1938. He worked for a short period for the National Park Service in Concord, New Hampshire, followed by the United States Public Housing Authority in Washington, D.C., where he met architects Louis Kahn and Eero Saarinen.[62] In 1942, Kiley married Anne Lathrop Sturges and opened his own office in Franconia, New Hampshire, where he was licensed to practice architecture based on a recommendation from Kahn and Saarinen. Kiley served in the U.S. Army from 1943 to 1945, where as Chief of the Design Section for the Presentations Branch of the Office of Strategic Services, he oversaw the design for the Nuremberg Courtroom. Reflecting on the importance of his time in Europe to his design approach, Kiley recalled:

> It was … the opportunity to travel around Western Europe and, for the first time in my life, to experience formal, spatial built landscapes (as championed in France by André Le Nôtre at its grandest, most rarefied level, yet found on every street of tiny towns and cities.) THIS was what I had been searching for—a language with which to vocalize the dynamic hand of human order on the land—a way to reveal nature's power and create spaces of structural integrity. I suddenly saw that lines, *allées* and orchards/bosques of tress, *tapis verts* and clipped hedges, canals, pools and fountains could be tools to build landscape of clarity and infinity, just like a walk in the woods.[64]

Seeking a rural environment in which to continue his design practice, Kiley returned to New Hampshire following the war, and eventually settled in Charlotte, Vermont, where he and Anne would ultimately raise their eight children. In 1946, Saarinen invited Kiley to join his team in proposing what came to be the winning design for the Jefferson National Expansion Memorial in St. Louis. While Kiley's design was never fully executed at the site, the attention the project garnered helped to bolster his career—as did his ongoing relationship with Saarinen.[65]

His first project in Columbus was a collaboration with Saarinen on the Irwin Bank and Trust project in downtown. Saarinen then recommended Kiley to design the garden of the Millers' new Columbus residence. As Kiley described it, the project allowed him the space "to fully explore ideas that had been percolating for more than a decade."[66] In reflecting on the opportunity, Kiley stated, "The pieces were all in place: the architect, the client, the site and my vision were ripe to produce a fully integrated modern work of coherent scale."[67]

In the succeeding years, Kiley went on to produce several significant landscape designs, many of which he did in collaboration with leading architects of his generation, including Eero Saarinen, I.M. Pei, and Kevin Roche.[68] Some of Kiley's most notable projects include:

- Rockefeller University, New York, New York, 1958
- Lincoln Center for Performing Arts, New York, New York, 1960
- Dulles international Airport, Chantilly, Virginia, 1963
- Ford Foundation, New York, New York, 1964
- North Christian Church, Columbus, Indiana, 1964
- Chicago Filtration Plant, Chicago, Illinois, 1965
- United States Air Force Academy, Colorado Springs, Colorado, 1968
- Oakland Art Museum, Oakland, California, 1969
- John F. Kennedy Library, Boston, Massachusetts, 1978
- Dalle Central, La Défense, Paris, France, 1978
- East Building, National Gallery of Art, Washington, D.C., 1989[69]

Fig. 2.2.1 Eero Saarinen. Date: c. 1955. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00001

Fig. 2.2.3 Alexander Girard. Date: 1970. Photo credit: copyright Charles Eames Office LLC.

Fig. 2.2.2 "Saarinen office staff: Eero Saarinen (left) and Kevin Roche, Bloomfield Hills, Michigan" Date: c. 1953-1961. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00020

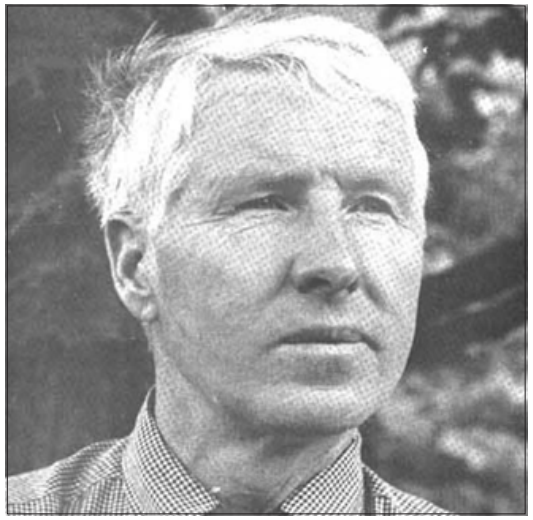


Fig. 2.2.4 Daniel Kiley. Date: n.d. Photo credit: alchetron.com

Kiley was awarded the National Medal of Arts in 1997 and the Lifetime Achievement award from the Cooper-Hewitt National Design Museum in 2002.[70] He died in 2004. In remembering Kiley, *Landscape Journal* wrote of his design relationships: "Dan Kiley was an architect's landscape architect. His work spoke in a vocabulary that Modernist architects understood, and demonstrated a seamless interdisciplinarity that was highly prized."[71] He was fondly remembered by his peers, such as Peter Walker, who proclaimed, "The legacy of Dan Kiley is that his work demonstrates how place informs life and how in turn life gives meaning and value to place. That he has done with art, grace and good humor to the lasting benefit of all."[72]

Engineers & Other Consultants

The following consultants also collaborated with the team on the Miller House, but limited additional information was available on their contributions to the design or other projects and design innovations:

- Samuel R. Lewis & Associates, Chicago, Illinois – Mechanical Engineers
- Richard Klees Jr., Detroit, Michigan – Electrical Engineer
- Bolt, Beraneck & Newman, Cambridge, Massachusetts – Acoustical Consultants (now Acentech) (see also section 6.16)[73]
- Thomas Dorste, Thomas Dorste & Spiros G. Pantazi, Architects Indianapolis, Indiana – Construction Administration

2.3 OTHER COLLABORATIONS

First Christian Church

The Miller House was an extraordinary project, one which was only possible because of the remarkable collaboration between the key players which developed through three projects over more than a decade. J. Irwin Miller (JIM) first met Eero Saarinen when Eliel Saarinen was engaged to design the Tabernacle Church of Christ, First Christian Church, completed in 1942. Miller's mother and uncle W.G. Irwin were on the building committee. Reportedly, the younger Miller encouraged his family members to consider the best architects in the United States for the project—and his aunt, Elise Irwin Sweeny, travelled to Cranbrook to convince the elder Saarinen to accept the commission.[74]

The First Christian Church project is noteworthy not simply for introducing Modern design to a small mid-western community like Columbus, but for establishing an extraordinary design process. Over five decades, it would influence not only JIM but transform Columbus into a design model found nowhere else in the world (see Section 2.7). The congregation gave their architect no guidelines for what the church should look like, but rather specified what it should accomplish: "'We believe that a church building can be created which will surround us in our worship with Christian feeling and which will produce in us and in our descendants a Christian consciousness that will be hard to lose.'"[75]

Saarinen responded with enthusiasm to the notion of a design which would reflect the congregation's goals rather than traditional, pre-conceived forms:

> "As we compare this development of your church with that of the new architectural thought—according to which order your church design is conceived—we find that they are very much alike both as to meaning and course of development, for, as your church emancipated itself from traditional theology, so the new architectural thought has freed itself from traditional styles."[76]

Equally important, the congregation expressed their desire that the building be modest and thus accessible for all citizens. Nettie Sweeney Miller had told Saarinen when she visited Cranbrook, "'Our town is small and there are all sorts and conditions of men. While we should like the church to be beautiful, we do not want the first reaction to be, how much did the church cost? We want the poorest women in town to feel at home there.'"[77]

Eero Saarinen's responsibility on the project was confined to "furniture, screens, railings, and light fixtures for the church's interiors," designed in collaboration with Charles Eames.[78] JIM later recalled that, during the design period before the start of World War II, "Eero used to come by … and Charlie Eames used to come down, and if the old men [W.G. Irwin and Eliel Saarinen] were busy we all had lots of time and we used to go out at night for hamburgers. We would have endless conversations about everything. We never had so much time or leisure again."[79]

Irwin Union Trust

JIM became president of the Irwin Union Trust Company after his uncle's death in 1947. By the end of 1949, he had contacted Saarinen about creating a new bank building, the Irwin Union Bank and Trust, which was completed in 1954 and is now a National Historic Landmark (NHL).[80] As with the church, this design would grow from innovative goals and values rather than the usual typologies. JIM said, "'We wanted to change—insofar as architecture could change it—people's concept of banking, which we thought was on the whole unfavorable.'"[81] Taking "a classic Modernist form, the Miesian glass pavilion," the design incorporated innovative features that "would welcome customers rather than intimidate them."[82] As the NHL nomination describes it:

> The main banking floor was open, with banking functions in sight of customers. It was on ground level, so steps would not need to be negotiated by the elderly or disabled. The floor was of a material so that even farmers with muddy boots would not hesitate to walk on it. The teller area had no bars. Rather, it consisted of a counter with drop-down plastic inserts, which avoided the necessity of having "window closed" signs.[83]

Saarinen engaged Dan Kiley to design the landscape, but Miller and Kiley do not appear to have met at this time.[84] Kevin Roche John Dinkeloo Associates completed an addition to the bank in 1973. In 2009, the bank was closed and in 2010, the Cummins Foundation purchased the property and renovated it to serve as their headquarters (Fig. 2.7 and 2.8).[85]

Fig. 2.3.2 Irwin Union Bank and Trust Co., interior. Date: 1950-1954. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00229

Fig. 2.3.1 Irwin Union Bank and Trust Co., exterior. Date: 1950-1954. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00224

Llanrwst

The extended Miller family had vacationed at Lake Rosseau in Windermere, Ontario, since 1886. Soon after (or simultaneous with) the bank commission, J. Irwin Miller engaged Saarinen and Girard to design a summer home—named Llanrwst—there for his growing family. JIM explained, "'It is a landscape that Eero understood because it is very much like Finland.'"[86] He related that the house was "built of wood and other local material and it doesn't have a right angle—[Saarinen] described it as 'spectacles on a monkey' curving around a rocky point."[87] The plan was "arranged on two levels to accommodate the Millers' desire to save as many trees as possible and keep a large boulder in place."[88]

Xenia Simons Miller's (XSM) daybook noted on June 28, 1951: "Eero, Lily, Susie Saarinen, Sandro, Susan Girard arrived for 3 days—worked on house plan."[89] Authorship of specific aspects of the house design is unclear—as would be true of the house they later designed in Columbus. Saarinen was in charge of the Irwin Bank project and, as noted previously, had collaborated with Charles Eames on the Entenza House (1949), published that year in *Arts and Architecture* as Case Study House No. 9. That plan compressed rooms into a square under an overhanging roof. Girard had designed the informal, wood-clad Jackson Lodge in Hillman, Michigan, in 1945.[90] The "cluster" plan of Llanrwst, with rooms connected directly to terraces and the outdoors, appears more closely related to homes completed in 1949–50 and published as Girard's work in *House & Home* in 1952—one designed for Daniel and Margaret Goodenough in collaboration with Minoru Yamasaki, the other the Girards' own home.[91]

A model of Llanrwst by Girard is included with the Girard Archives in the Vitra Collection.[92] However, the Saarinen Archives at Yale include a full set of plans, elevations and details, and Will Miller's account gives most of the credit to Saarinen:

> In an early scheme, the children were to be housed in a separate building to the north on a high point of the peninsula. As architect and clients gathered around the model, Xenia expressed reservations about being so disconnected from the children. Saarinen suddenly tore the children's wing off the hill and placed it on top of the other two sections to act as a bridge between them. Thus was born the dramatic horseshoe shape of the house...The move integrated the interior and exterior spaces formed by the house.[93]

In exterior treatment, Saarinen drew from the local vernacular, using "board-and-batten siding, fine stonework, open-air porches and simple uninsulated construction techniques" (Figs. 2.3.5 and 2.3.6).[94] The color palette was refined by Girard and XSM, including "dark brown wood siding, gray plywood panels and white wood sashes, with vivid splashes of red, yellow and orange on the doors."[95]

Girard was certainly responsible for selection of furnishings (Figs. 2.3.3 and 2.3.6).[96] On July 14, 1952, the *Columbus Evening Republican* reported the following:

> Irwin and Xenia Miller are leaving Tuesday and Wednesday of this week for their brand new summer home at Muskoka, Ont., in Canada...Their new home, designed by Saarinen, the famous Finnish architect, is ready for occupancy, right down to the last pot and pan. One of Saarinen's staff of 22 architects [sic], Alexander Girard, a specialist on interiors, was in charge of that part of the project and you can bet it is the last word in modern functional living.[97]

Years later, in June 2000, JIM confirmed, "We were very happy with the house [Saarinen] designed for us in Muskoka."[98] He further related:

> There was an electrical fire [at the Muskoka house] in January [1996] ... . About half the house was destroyed—the kitchen, dining room, guest bedrooms, were saved. It was rebuilt from original plans and from the outside you wouldn't know that anything had changed. We took advantage of that, in view of our advanced age, to change the three levels of the living room to one.[99]

Fig. 2.3.3 View of Llanrwst, Miller summer home, from the lake. Date: 1950-1952. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-KRB-00199

Fig. 2.3.4 View of Llanrwst, Miller summer home, terrace. Date: 1950-1952. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00189

Fig. 2.3.5 View of Llanrwst, Miller summer home, from terrace to the lake./Date: 1950-1952. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00197

Fig. 2.3.6 View of Llanrwst, Miller summer home, interior. Date: 1950-1952. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00208

North Christian Church

The final collaboration between the Millers, Saarinen, Girard, and Kiley began in 1956, before the Miller House and Garden was completed. The Millers and other members of First Christian Church downtown founded a new congregation and purchased land a few miles north of the MH&G. The congregation interviewed a half dozen architects and ultimately chose Saarinen, who engaged Kiley to design the landscape and Girard to develop concepts for liturgical elements. Saarinen died while the project was still in design, so the project was completed by Kevin Roche. Its iconic hexagonal shape and soaring spire were widely copied for other ecclesiastical projects.[100]

Fig. 2.13 North Christian Church, Carol M. Highsmith. Date: 2011. Photo credit: Library of Congress, Prints & Photographs Division, photograph by Carol M. Highsmith, LC-DIG-highsm-18660

2.4 THE MILLER HOUSE AND THE PRIVATE HOME IN THE TWENTIETH CENTURY

"In the four years following the end of [World War II], Americans purchased 21.4 million cars, 20 million refrigerators, 5.5 million stoves, and 11.6 million televisions and moved into 1 million new housing units each year."[101]

The cars, appliances and homes that created the post-war housing boom were the result of a deliberate strategy created within government, industry and the financial sector to convert factories from military to civilian production after World War II. Large-scale suburban developments represented the bulk of this production and the gamut of styles, from Colonial Revival to contemporary. However, it was the custom-designed single-family house which pushed the boundaries of design and captured public interest.

Since Roman times, the rural or suburban retreat had been an aspiration for the elite and a proving ground for the latest architectural design ideas. In the early twentieth century, Frank Lloyd Wright and the architects of the Art Nouveau, Arts and Crafts and Modernism movements had explored ideas about open plans and modern living in their designs for leaders of arts and industry. Modernist manifestos such as Le Corbusier's *Vers Une Architecture* (1923) featured the Rietveld-Schröder House (1924), Le Corbusier's Villa Savoye (1928) and the Barcelona Pavilion (1929) by Mies van der Rohe. In the United States, the 1932 International Style exhibition at the Museum of Modern Art focused attention on masterworks such as Frank Lloyd Wright's Robie House (1909) and Fallingwater (1936) as well as the work of European émigrés, including the Kings Road House (1922) by Rudolph Schindler and the Gropius House (1937) by Walter Gropius.[102]

Two private homes became symbols of the International Style or Modernism in the United States during the post-war period: the Dr. Edith Farnsworth House (1950), in Plano, Illinois, by Mies van der Rohe and the Philip Johnson House (1949), in New Canaan, Connecticut, designed by Johnson for himself (Figs. 2.4.1 and 2.4.2). Johnson had included a model of the Farnsworth House, still unbuilt, in an exhibition of van der Rohe's work for the Museum of Modern Art in 1947 and both sites were among 15 private homes featured in the Museum of Modern Art's "Built in the USA: Post-War Architecture" exhibition in 1953.[103] In the exhibition catalog, the museum's Curator of the Department of Architecture and Design Arthur Drexler claimed, "No building by Mies, in the United States, shows more clearly the relation between conspicuous space and the structure that generates it than does his house for Dr. Edith Farnsworth... The Farnsworth house is, indeed, a quantity of air caught between a floor and a roof."[104] Interior partitions were eliminated as much as possible, creating "open plans" in which "servant" spaces such as kitchen and bathrooms floated in the center

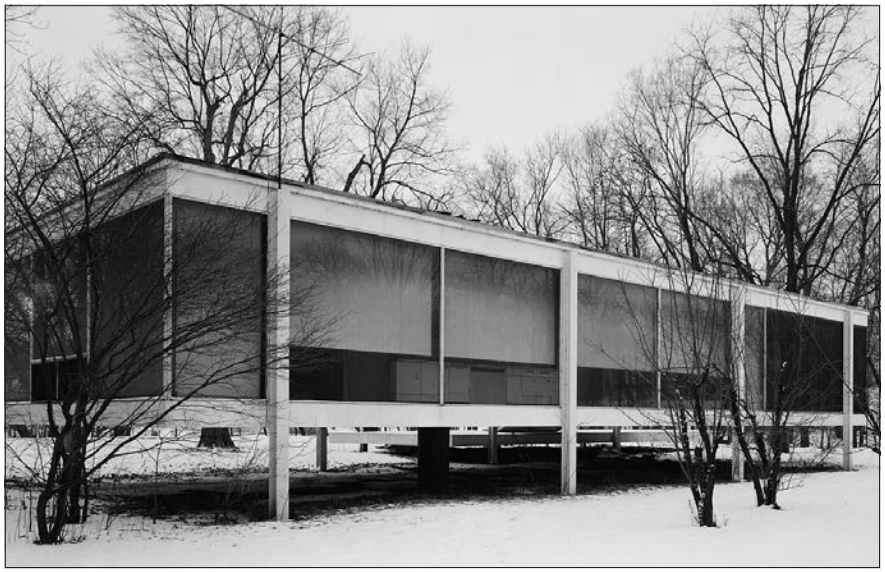


Fig. 2.4.1 Edith Farnsworth House, Plano, Illinois. Date: 1974. Photo credit: Jack E. Boucher, Historic American Buildings Survey, Library of Congress, HABS lLL,47-PLAN.V,1--1

Fig. 2.4.3 Case Study House 9, Interior, Living Room. Date: 2011. Photo credit: Andy Hurvitz, Los Angeles Conservancy, CA

Fig. 2.4.2 Philip Johnson's Glass House, New Canaan, Connecticut. Date: 2008. Photo credit: Library of Congress, Prints & Photographs Division, photograph by Carol M. Highsmith, LC-DIG-highsm-04361

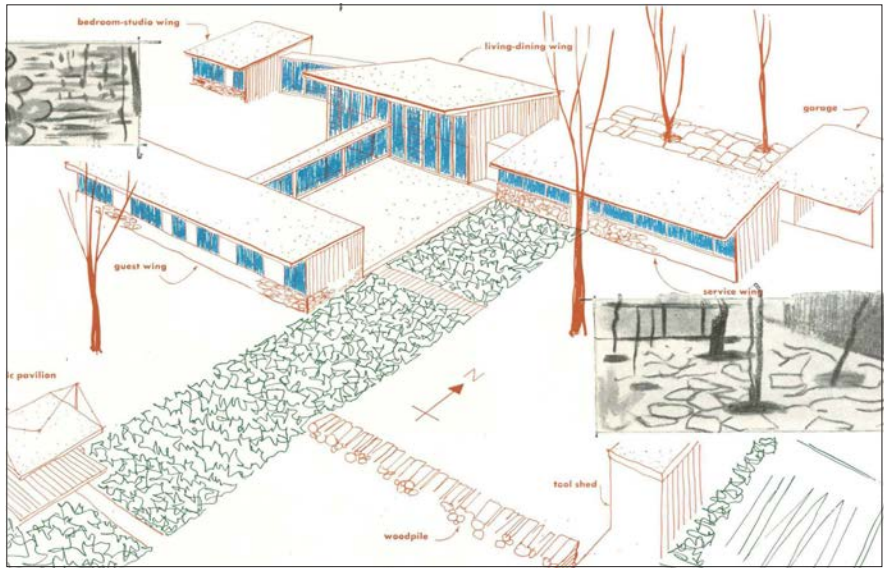


Fig. 2.4.4 Floor plan of Girard House from House & Home, November 1952.Date: 1952. Photo credit: House & Home from https://usmodernist.org/index-hh.htm

of the living spaces.

Saarinen's second private home project incorporated many of these features, "[enclosing] as much space as possible within a fairly simple construction."[105] Designed in collaboration with Charles Eames, located next door to Eames' own house in the Pacific Palisades overlooking the Pacific Ocean and known as Case Study House #9, or the Entenza House, the house was completed in 1949, though plans had been published in *Arts & Architecture* in 1945.[106] With a goal of "promot[ing] contemporary design solutions to the problem of providing American families with well-designed, forward-looking, yet modest homes," the magazine's Case Study Houses "established a residential design vocabulary of flat-roofs, open floor plans, an orientation away from the street and towards private gardens at the rear, integration of outdoor space with indoor space, and generally accomplished with the use of inexpensive materials."[107]

The client was John Entenza, editor-in-chief of *Arts & Architecture,* who was described by friends as "a very moral man with a strong work ethic"—a description similar to the one often painted for JIM.[108] With 35 house plans published and 25 built in California and the Southwest between 1945 and 1966, the Case Study program featured many designers who were relatively unknown at the time but later became famous. It rivaled the Cummins Foundation's work in Columbus (see Section 2.7), started in 1954, as "the most significant statement of architectural commitment that America had ever seen."[109]

While the "glass box" was promoted by museums and architectural periodicals, the general public and many women's or "home" magazines were less enthusiastic. In 1953, Elizabeth Gordon, editor of *House Beautiful*, penned a lengthy critique of International Style homes in general and the Farnsworth House in particular. Gordon stated:

> The much-touted all-glass cube of International Style architecture is perhaps the most unlivable type of home for man since he descended from the tree and entered a cave. ...The bare minimum of gadgets and possessions so as not to spoil the 'clean' look; three or four pieces of furniture placed along arbitrary pre-ordained lines; room for only a few books and one painting at precise and permanent points; no children, no dogs, extremely meager kitchen facilities—nothing human that might disturb the architect's composition.[110]

A direct contrast to the picture painted by Gordon was offered in the houses that Alexander Girard had been designing since 1945. An article published in *House & Home* in 1952, titled "Here is How Alexander Girard Goes about Designing a House," featured two houses in Grosse Point: Girard's own residence at 222 Lathrop Road (1948) and one built next door at 232 Lathrop (1951) for chemist George Rieveschl and his wife.[111] The writer noted: "Girard's houses are as modern as any built today: open plans, huge walls of glass, structure used decoratively, indoor-outdoor planning done concurrently—all these are obvious features. But they seem less self-assertive here than in most modern work. ...A trip through a Girard house is as full of surprises and delights as a walk through the great bazaars of Istanbul."[112]

Miller House: A New Modern House Paradigm

The Farnsworth and Johnson Houses were glass boxes located in rural settings, weekend homes owned by a single person or couples without children. *LIFE Magazine's* feature on Johnson's home, which became known as the "Glass House," noted: "Except when entertaining, Johnson lives alone, servantless and companioned only by weather, paintings and books."[113] The Miller House, by contrast, was a full-time residence that accommodated not only J. Irwin and Xenia Miller, but their four young children plus staff; their fifth child, Will Miller, was born just before the house was completed. For these and other reasons, the design concept marked a significant departure from the archetypal "glass box"—one which combined rigorous Modern design concepts with equally-meticulous accommodation of personal needs.

In the absence of detailed correspondence from and between Saarinen and Girard during the design of the Miller House, it is difficult to delineate the individual authorship of the core concepts. All drawings for the house, while produced by Saarinen's office, list both that office and Girard's as "architect." The house was sited and mostly designed by the time Kiley joined the project, so the landscape design responds to the house. Kiley supported and extended the design logic the architects had already begun.

The article on Girard's Grosse Point work in *House & Home* explained that "The [Rieveschl House] is really four separate houses linked by glazed passages: A service house with kitchen and utilities; a living-dining house; a house for guests; and a house for the owner's bedrooms. Between these houses are paved and planted ter¬races."[114] This echoes the description of the Miller House *parti* in *Architectural Forum* six years later: "Instead of dispersing the separate 'houses' for parents, children, guests and service, Architects Eero Saarinen and Alexander Girard arranged the four units pinwheel fashion around the perimeter of a single 100 by 120 foot roof structure."[115] The components are described as "Girard's modules" in correspondence from Roche to JIM before the design was finalized.[116]

Architectural Forum compared the plan diagram to that of Andrea Palladio's Villa Capra, known as "La Rotonda" (1567) (Fig. 2.17). The anonymous author of the article cautioned, however, that "the pinwheel arrangement is as different from its predecessor as Bartok's contemporary music is from Palestrina's renaissance music."[117] Schematized diagrams of Palladian villas had gained attention just a decade earlier through Rudolf Wittkower's influential articles on "Principles of Palladio's Architecture," published in the *Journal of the Warburg and Courtauld Institutes* in 1944 and 1945.[118] The relevance of Renaissance models and modules for contemporary design was highlighted in "The Mathematics of the Ideal Villa," Colin Rowe's seminal 1947 essay in the British publication *Architectural Review*. There, he compared Le Corbusier's Villa Savoye with La Rotonda.[119]

At the Miller House, private rooms for parents and children, as well as "service" spaces like the kitchen and garage, were arranged around the perimeter of the central space. The kitchen, carport and servant or guest quarters were situated in the most "public" areas next to the drive, while the master suite and children's sleeping modules are on the opposite side, with windows overlooking and protected by the gardens.

Saarinen later acknowledged: "Today many of us have come back to much more 'closed' plans, where rooms are really rooms with four walls."[120] Kevin Roche maintained that the built form was not based on Palladio's Villa Rotunda, but an extension of ideas which van der Rohe had introduced in 1929 with the Barcelona Pavilion. These included:

- Alternation of solid and void,
- Book-matched stone as wall and decoration, set so that ends are revealed,
- Expressed columns and capitals within skylight,
- Reflecting pools.

Again, the Miller House is remarkable for expressing these concepts in a lively, functional home, rather than a temporary exhibit, with no real function. The Barcelona Pavilion is only two spaces wide at most and light can enter from all sides. At the Miller House, with private and service rooms on the perimeter, skylights were required to illuminate the living area in the center, and thus a thicker roof was required. On the other hand, the location of the Miller House in a large suburban site, rather than the dense urban fabric of Barcelona, enabled the Modernist design ideas to extend into the landscape.

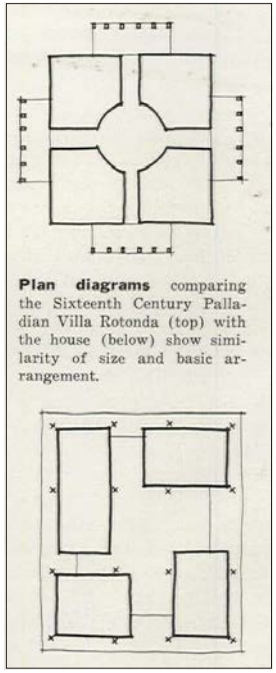

Plan diagrams comparing the Sixteenth Century Palladian Villa Rotonda (top) with the house (below) show similarity of size and basic arrangement.

Fig. 2.4.5 Miller House floor plan diagrams from Architectural Forum. Date: September 1958. Photo credit: Architectural Forum from https://usmodernist.org/index-af.htm

2.5 THE MILLER HOUSE IN THE PUBLIC IMAGINATION: ARCHITECTURAL PHOTOGRAPHY AND MID-CENTURY MODERNISM

The breadth and frequency with which a site is published are clear measures of its significance and impact. Despite the prominence of its designers, however, the Miller House and Garden was noteworthy for how carefully its owners avoided the limelight during the first decades after completion, when interest would have been highest. As Christopher Monkhouse, former curator and chair of European decorative arts at the Art Institute of Chicago, noted, "Miller intended to maintain the low profile of his…house by severely restricting the building's appearance in publications and forbidding any mention of his name, the house's specific location or its cost."[123]

During the post-war building boom, the number and size of architectural publications expanded greatly, as did coverage of architects and architecture in the popular press and museum exhibitions. Architect and author Pierluigi Serraino noted:

> The media were paying close attention to Eero Saarinen, who after the General Motors Technical Center project had become a public icon. From his father he had inherited all the contacts with the most reputable architectural magazines in the country, and kept them alive through his prolific creativity. The popular press was equally attracted to him: *Time magazine* devoted its July 2, 1956 cover story to Eero Saarinen. Aline, Eero's second wife, was instrumental in the management of his persona in the press and kept the momentum going.[124]

Columbus and Saarinen's Irwin Bank were featured in *Architectural Forum* in October 1955 as "A Study in Small-Town Progress."[125] Girard and his projects were also frequently profiled in publications. Not long after the house was completed, the *New York Times* contacted JIM requesting permission to photograph the house.[126] JIM responded on August 9, 1957: "My wife and I have not really made our minds up on the subject of publishing pictures of our house. Our own desire is to publish none, but we desire also not to stand in the way of the recognition due Messrs. Saarinen and Girard in respect to the very fine work which they have done on this project."[127]

The day before, JIM had written to Girard:

> Xenia and I are willing to see pictures and text published about it, provided (as we have discussed) no mention is made of owner, location, or cost. However, we would prefer that only one set of pictures be taken and these at one convenient time. … My suggestion is that you and Eero get together and decide who you want to have do this job and what publications you wish to consider in what order. Then perhaps it can be done in a planned and orderly manner.[128]

Ezra Stoller (1915–2004)

Saarinen and Girard agreed on Ezra Stoller, "the architecture photographer of choice on the East Coast at the time."[129] In the decades after World War II, Stoller's iconic views included Frank Lloyd Wright's Guggenheim Museum, Louis I. Kahn's Salk Institute for Biological Studies and Saarinen's T.W.A. Terminal. Trained as an architect, he modestly claimed: "While I cannot make a bad building good, I can draw out the strengths in a work that has strength."[130] Serraino, who authored of a monograph on Stoller, pointed out that, to a large extent, "the photographer becomes the interface between the existence of the building as a material entity and the consciousness of the building in the general public."[131] This was certainly true of the MH&G, not accessible to the public for 60 years.

Preparations were made for Stoller to photograph the site over a period of three days, beginning on April 1, 1958.132 One challenge was that the landscape construction was scheduled for completion the same day. George Newlin, president of Irwin Management and a key player in the construction project, informed JIM: "Regarding photography, Dan Kiley has advised Saarinen's office that the grass will not be truly 'photogenic' until about the first of June… the magnolias will be probably in their best bloom about the 15th of April."[133] Roche had suggested to Newlin that exterior photographs be taken a month later, but there is no question that any images would still capture a relatively "young" landscape installation.[134]

Girard was present to "arrange the house for photographing."[135] No sooner had Stoller left the site than the magnolias came into bloom; he responded to a suggestion that he return immediately by saying, "I can

understand Mr. Miller's anxiety but I am sure the landscaping will only improve with time and it may well be that in pictures the house would disappear under the impact of the flowering trees."[136] JIM was even more concerned that photographer and publications honor the stipulations that had been established: "Namely, no mention of name of client, no mention of location of house, no mention of cost of house," and requested that Girard "re-state these conditions" due to the "well known care-free attitude of the press."[137]

Architectural Forum, September 1958[138]

The first published views of the house appeared just four months after Stoller's first photo shoot, and included a dozen of Stoller's images, only two capturing the vibrant colors of Girard's interiors. Equal prominence was given to diagrams of the skylights, the site and floor plans and a comparison between the house and Villa Rotonda, reinforcing the article's title—"A Contemporary Palladian Villa"—an appellation that Saarinen disliked.[139] While repeating Saarinen's prejudice that "few houses are important as architecture," the author opined that "this pristine and delightful house is of general significance because it combines two apparently opposite concepts of residential planning: first, a lightly-linked collection of individual 'houses' each containing a separate function and; second, a single structure with one central space dominating the entire building."[140]

House and Garden, February 1959[141]

Headlined "A New Concept of Beauty," the *House and Garden* article five months later exclaimed, "Life is enriched, living is enhanced by daring new uses of space, light and fine materials"[142] (Figs. 2.5.1 – 2.5.3) The house was deemed a "Hallmark House," an award established by the publication in 1957 to recognize "the worth of a house in human terms" and "excellence of design [that] must serve a family in beauty and pleasure."[143] Unlike the more analytical tone of *Architectural Forum*, the *House and Garden* article enthused, "What lifts the spirit here is the disposition of space and the distribution of light, the easy alliance with nature outdoors and the tranquility of each private part of the house."[144] Will Mehlhorn, Architecture Editor of *House and Garden*, wrote from personal experience, having visited the house the previous summer. He had told the Millers: "We have given the story a number of color pages and I am sure our reproduction will be far better than a previous story done on the house."[145]


H&G Hallmark House No.3

A new concept of beauty

Life is enriched, living is enhanced by daring new uses of space, light and fine materials

Fig. 2.5.1 "A New Concept of Beauty" opening spread from House and Garden. Date: 1959. Photo credit: Miller House and Garden Collection (M003), Newfields Archives

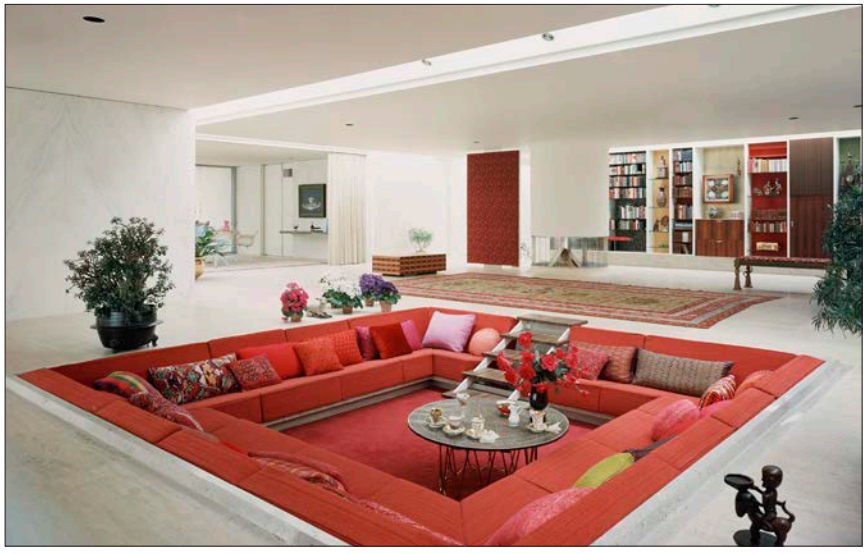


Fig. 2.5.2 View of Conversation Pit by Ezra Stoller as published in House and Garden, February 1959. Date: 1959. Photo credit: © Ezra Stoller / Esto 00031491

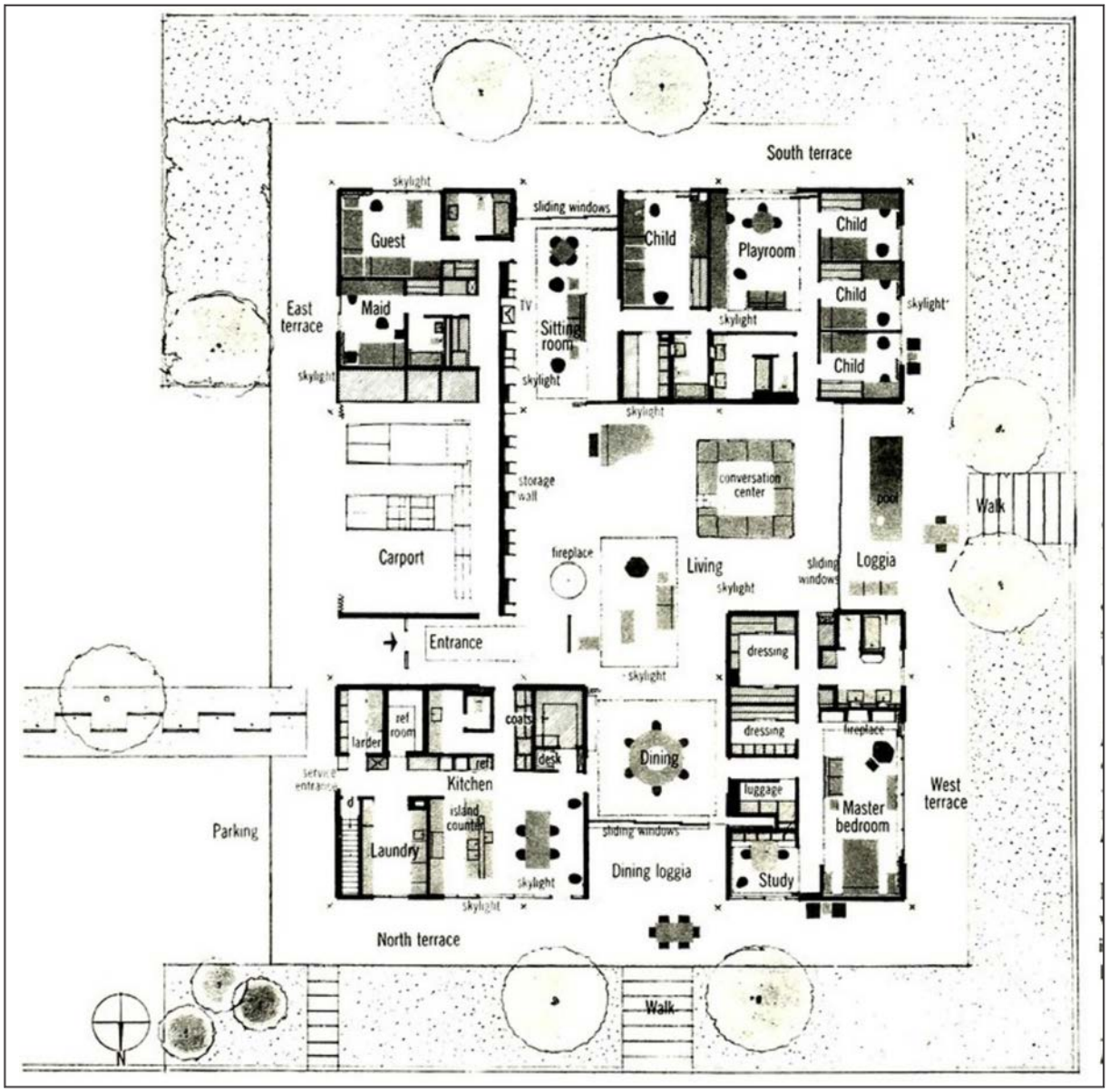


Fig. 2.5.3 Floor plan with furnishings from House and Garden, February 1959. Date: 1959. Photo credit: Miller House and Garden Collection (M003), Newfields Archives

Balthazar Korab (1926–2013)

In 1962, the house received international coverage in *L'Oeil* as "une demeure concue par un des grands architects contemporaine [a dwelling conceived of by one of the great contemporary architects]."[146] The six-page spread noted the collaboration with Girard and Kiley and characterized it as "a house for friends" which, with the project in Canada, were identified as Saarinen's only private home commissions.[147] The photographs were by Balthazar Korab, who, in the course of "a nearly fifty-year relationship with the project...was given nearly 'open access' to the house and land¬scape during his frequent trips to Columbus."[148]

Korab, born in Hungary and trained as an architect at the Ecole des Beaux Arts after World War II, joined Saarinen's office in 1955, while visiting his wife's family in Detroit. One of his first assignments in the studio was the design of the fireplace in the Miller House Living Room (see Section 6.11) and he shot photographs of his models, as well as many others in the office, built as important study tools. Korab left Saarinen's office in 1958 to pursue his own design projects as well as photography, ultimately becoming "the 'photographer of choice' for numerous projects supported by the Cummins Foundation."[149] His commissions rivaled those of Stoller, Julius Shulman and the firm of Hedrich Blessing, who had photographed the Irwin Bank for *Architectural Forum*.[150]

Biographer John Comazzi claimed, "The Korab portfolio of the Miller House is so unique in its approach and expansive in its breadth that it may very well be the most definitive representa¬tion of mid-century Modern dwelling that you have likely never seen."[151] In a decided contrast to Stoller, "he was not afraid to let a couple of flowering magnolia trees share the spotlight with Mr. Saarinen's home for Mr. Miller," and his nearly 100 images of the site, now in the collection of the Library of Congress, provide excellent documentation of the full realization of Kiley's landscape.[152]

General Interest

According to Christopher Monkhouse:

> "The mystery location of the house did little to stem the tide of attention for [the Miller House]. In Minneapolis, Ken and Judy Dayton, of the family that owned Dayton's Department Stores, marked 'Keep' on their *House & Garden* issue and called Saarinen's office, hoping to commission a Modernist house. From the other side of the world, the ruling family of Bahrain also contacted him. ...They wanted a house just like it."[153]

LIFE Magazine staff photographer Frank Scherschel took almost two dozen photos of the house in 1961 which, unlike the Stoller or Korab images, showed the Miller family occupying the Living Room, Office and other spaces.[154] These images do not appear to have been published, perhaps because of the Millers' desire for privacy.

2.6 J. IRWIN MILLER, THE CUMMINS FOUNDATION, AND COLUMBUS, INDIANA

The Miller House did appear in *Life* in 1967, though the House was largely hidden from view. The article titled "An American Renaissance" declared Columbus to be "a showcase of the best in modern architecture, a model and inspiration for other towns" and credited JIM and the Cummins Foundation.[155] The image by photographer John Loengard depicted JIM "lounging on the grass of his spacious lawn" according to the caption.[156]

JIM acknowledged that an appreciation for contemporary design had not come naturally to his hometown. When Eliel Saarinen's First Christian Church was completed in 1942, JIM recounted that: "The result was that the congregation was captivated by the building with an absolute minimum of objections and the community was appalled. They said: 'Wonder when they're going to move in the machinery?' [suggesting that the form was more suitable to a factory than a church]. The community was not prepared for it, but the congregation was."[157] Nonetheless, his informal meetings with Eero Saarinen "'gave [him] a lot of incentive to get going after World War II.'"[158] JIM noted:

> "After the war, the community doubled because of the industry here, and it became evident that we were going to have to build a lot of schools. ...We at Cummins [Engine Company] felt that while the quality of the school system is primarily determined by the teachers and the curriculum, the surroundings have something to do with it, too."[159]

The Cummins Engine Foundation, now the Cummins Foundation, was established in 1954, and the Architecture Program was created in 1957. Its first grant was for the Lillian C. Schmitt Elementary School, designed by Harry Weese.[160] Saarinen had told JIM about the U.S. State Department's post-war design program, which invited the country's leading architects to compete for U.S. embassies around the world. Saarinen had been won the design commission for the U.S. Chancellery in London in 1955.[161]

JIM asked Saarinen and Pietro Belluschi (1899–1994), a Modernist who was then dean of the School of Architecture at MIT, "'to set up a structure which would isolate us at Cummins as far as possible from direct architectural decisions.'"[162] He continued to explain:

> "We picked those two guys, who then picked a panel of six to eight architects. The idea was to get not necessarily the most famous ones, but those who were really young and eager, beginning their creative period, who would love to get a chance to make a new statement of what a school should be."[163]

Saarinen and Belluschi were joined by Doug Haskell of *Architectural Forum*. The Cummins Foundation agreed that, if the Columbus schoolboard selected one of the recommended architects, they would pay the design fees. JIM said that he told the school board,

> You can either take this program or not; it's up to you. No pressure, no hard feelings. You don't have to, but if you do, then please interview all the architects. If you pick one, he [sic] has to comply with your budget standards and meet state requirements and everything else...We will then pick up the architect's fee on this basis: that he has total responsibility for furnishings, landscaping—the whole bit—and if you later expand the school, you go back and use the same architect.[164]

In 1965, the program was extended beyond schools to encompass other civic buildings and infrastructure as well as sites within Bartholomew County.[165]

Architectural Forum featured the work as "A Study in Small-Town Progress" in 1955 and, in the following decade, general interest publications such as ***LIFE Magazine***, the *Saturday Evening Post*, the *Wall Street Journal*, the *Washington Post* and the *Christian Science Monitor* followed.[167] Almost two decades later, James A. Michener, best-selling author of the mid-twentieth century, called the town a "Museum for Living" and interviewed JIM for television, compiled in a 1981 book, *James A. Michener's USA*.[168]

Over five decades, the Foundation funded design of fifteen schools, fifteen other civic buildings, and five urban plans. Their sponsorship and the spirit of design excellence also inspired other private and community organizations. In 2012, a survey by the American Institute of Architects of its members ranked Columbus sixth behind Chicago, New York, San Francisco, Boston, and Washington, D.C., for its architectural quality and innovation.[169]

2.7 ENDNOTES

[1] Relevant biographies of the client and design team are cited in the individual sub-sections which follow. The overall scope of research and manuscript collections consulted for this report are described in the Note on Sources in Appendix A.
[2] Maire Gurevitz et al., "Irwin-Sweeney-Miller Family Collection," October 2012, Manuscript and Visual Collections Department, William Henry Smith Memorial Library, Indiana Historical Society, Indianapolis, https://indianahistory.org/wp-content/uploads/irwin-sweeney-miller-family-collection.pdf.
[3] Eric Pace, "J. Irwin Miller, 95, Patron of Modern Architecture, Dies," *New York Times*, August 19, 2004, https://www.nytimes.com/2004/08/19/business/j-irwin-miller-95-patron-of-modern-architecture-dies.html.
[4] Steven V. Roberts, "Is It Too Late for a Man of Honesty, High Purpose and Intelligence to Be Elected President of the United States in 1968?" *Esquire*, October 1, 1967, https://classic.esquire.com/article/1967/10/1/is-it-too-late-for-a-man-of-honesty-high-purpose-and-intelligence-to-be-elected-president-of-the-uni; William Dowling, "Conversation ...with J. Irwin Miller," *Organizational Dynamics 4*, no. 1 (Summer 1975): 31, ScienceDirect. This figure would be an equivalent of close to $7 billion in April 2022; see "$832,000,000 in 1967 to 2022, Inflation Calculator," Official Inflation Data, Alioth Finance, February 1, 2022, https://www.officialdata.org/us/inflation/1967?amount=832000000.
[5] Robert Campbell, "Industrial Strength Humanist: J. Irwin Miller Knew How to Get Things Built," *The American Scholar* 74, no. 1 (Winter 2005): 121.
[6] J. Irwin Miller to Tim M. Solso, letter, March 29, 2000, Box 29, Folder 6, Indiana Historical Society, quoted in Charles E. Mitchell Rentshler, *The Cathedral Builder: A Biography of J. Irwin Miller* (Bloomington, IN: AuthorHouse, 2014), 151.
[7] Pace, "Patron of Modern Architecture"; Roberts, "Is It Too Late," 182.
[8] Roberts, "Is It Too Late," 182.
[9] Roberts, "Is It Too Late." 189.
[10] Roberts, "Is It Too Late," 175.
[11] Roberts, "Is It Too Late," 175.
[12] Will Miller, quoted in Campbell, "Industrial Strength Humanist," 121.
[13] Dorothy Kalins, "This is Irwin Miller," *Town and Country*, July 1974, 45, 84.
[14] Campbell, "Industrial Strength Humanist," 120. Perhaps under the influence of Miller, Yale would commission Saarinen to design several Modernist structures, including Morse and Stiles Colleges in 1958.
[15] See, for example, Pace, "Patron of Modern Architecture," or Claudia Luther, "J. Irwin Miller, 95; Patron of City's Architecture," *Los Angeles Times*, August 22, 2004, https://www.latimes.com/archives/la-xpm-2004-aug-22-me-miller22-story.html; J. Irwin Miller, "Cummins Co-operation: Role of the Client, J. Irwin Miller," interview by The Architectural Review, *The Architectural Review 171*, no. 1020 (February 1, 1982): 21.
[16] Stephen Fox, "Patronage and Modernism," in *Avant-Garde in the Cornfields: Architecture, Landscape, and Preservation in New Harmony* (Minneapolis: University of Minnesota Press, 2019), 41.
[17] Fox, "Patronage and Modernism," 47.
[18] Will Miller, "Joseph Irwin Miller, 26 May 1909 - 16 August 2004," *Proceedings of the American Philosophical Society 150*, no. 3 (September 2006): 496.
[19] Will Miller, "Eero and Irwin: Praiseworthy Competition with One's Ancestors," in Eeva-Liisa Pelkonen and Donald Albrecht, eds., *Eero Saarinen: Shaping the Future* (New Haven: Yale University Press, 2006), 59.
[20] Will Miller, "Eero and Irwin," 59.
[21] Connie Zeigler, *Xenia Simons Miller: Prairie Modernist, Commercial Article 11* (Indianapolis: Commercial Artisan, 2018), 12, 27-30, 47.
[22] Zeigler, *Prairie Modernist*, 46-47.
[23] Xenia and J. Irwin Miller, interview by Michael Webb, Columbus, Indiana, June 13, 2000, MHG Ib B021 F222 017-022, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields, hereafter cited as Newfields Archives.
[24] Christie's, Inc., *Property from the Estate of J. Irwin and Xenia S. Miller*, auction catalogue (London: Christie's, Inc., June 24, 2008), 9. An article in the Columbus paper written after her death claimed that "Mrs. Miller had identified herself as an art supporter not long after her husband assumed a role on the board of the Museum of Modern Art. She educated herself about everything from painting to sculpture by starting with a book, 'Twelve Artists,' and later added elements such as an art history class at Indiana University"; see Brian Blair and Paul Minnis, "Miller Educated Self to be an Art Aficionada," *The Republic*, February 21, 2008. Note that JIM was not appointed to the MOMA board until 1970, and XSM's support seems to predate this.
[25] "The Famed Collection of J. Irwin and Xenia S. Miller to be Offered at Christie's in London," *Artdaily*, May 16, 2008, https://artdaily.cc/news/24249/The-Famed-Collection-of-J--Irwin-and-Xenia-S--Miller-to-be-Offered-at-Christie-s-in-London#.XtkQX_J7mi4.
[26] Christie's, *Property from the Estate*, 8.
[27] "Eliel Saarinen," https://www.britannica.com/biography/Eliel-Saarinen (accessed 1 June 2022).
[28] Laura Thayer, Louis Joyner, and Malcom Cairns, "Miller House," National Historic Landmark (NHL) Nomination Form (Washington, D.C.: United States Department of the Interior, National Park Service, 1999), 10.
[29] Thayer, Joyner, and Cairns, "Miller House," NHL, 12.
[30] Thayer, Joyner, and Cairns, "Miller House," NHL, 10.
[31] Eliot F. Noyes, Organic Design in Home Furnishings (New York: Museum of Modern Art, 1941), exhibition catalog, published in conjunction with an exhibition of the same title, organized and presented by the Museum of Modern Art, September 24-November 9, 1941, https://www.moma.org/calendar/exhibitions/1803.
[32] Artzy Basheff, cover illustration, *Time 68*, no. 1 (July 2, 1956), Aline B. Saarinen, "Four Architects Helping to Change the Look of America," *Vogue* 126, no. 2 (August 1, 1955): 118-121, 149, 150, 152, ProQuest.
[33] Allan Temko, *Eero Saarinen* (New York: George Braziller, 1962), 36-37, 41, Allan Temko, quoted in David G. De Long, "Rediscovering Eero Saarinen" in David G. De Long and C. Ford Peatross, eds., *Eero Saarinen: Buildings from the Balthazar Korab Archive* (New York: W.W. Norton & Company; Washington, D.C.: Library of Congress Visual Sourcebooks in Architecture, Design, & Engineering, 2008).
[34] Peter Papademetriou, quoted in De Long and Peatross, *Eero Saarinen*, 8.
[35] Aline B. Louchheim, "Now Saarinen the Son," *New York Times*, April 26, 1953. This was the interview which sparked the romance of Saarinen and Louchheim, leading to Saarinen's divorce and their marriage in 1954.
[36] Fox, "Patronage and Modernism," 43.
[37] Fox, "Patronage and Modernism," 43.
[38] Jayne Merkel, *Eero Saarinen* (London: Phaidon, 2005), 151.
[39] Eero Saarinen, in John Peter, *The Oral History of Modern Architecture: Interviews with the Greatest Architects of the Twentieth Century* (New York: Harry N. Abrams, Inc., 1994), 206.
[40] In addition to the Millers' summer house in Canada, the homes include: the J.B.

Spencer House in Huntington Woods, Michigan (1938), noted as the younger Saarinen's first independent commission; the Loja Saarinen House (1950), built on the grounds of Eero's own home in Bloomfield Hills, Michigan; and Case Study House No. 9 (1949), designed with Charles Eames; see Patrick Sisson, "21 First Drafts: Eero Saarinen's J.F. Spencer House," Curbed, August 24, 2015, https://archive.curbed.com/2015/8/24/9927798/21-first-drafts-eero-saarinens-jf-spencer-house; and Steven Kyle, "Case Study House #9," National Register of Historic Places Registration Form (Washington, D.C.: United States Department of the Interior, National Park Service, 2013), https://npgallery.nps.gov/GetAsset/98b2226e-fe13-4098-b708-3801ac9834b6. Saarinen had designed two homes with his father Eliel: Koebel House, Grosse Pointe Farms, Michigan 1937-1940, also credited to Pipan (Saarinen) Swanson and Robert Swanson, and the Wermuth House, Fort Wayne, Indiana, 1941-1942; from "Inventory of Buildings and Projects" in Eero Saarinen: Shaping the Future.

[41] Juulia Kauste et al., "Foreward," in *Eero Saarinen: Shaping the Future*, ed. Eeva-Liisa Pelkonen and Donald Albrecht (New Haven: Yale University Press, 2006), ix.

[42] Many of the publications are listed in the Bibliography, including: Merkel, Jayne. *Eero Saarinen* (2005); Eeva-Liisa Pelkonen and Donald Albrecht, eds., *Eero Saarinen: Shaping the Future* (2006); and De Long, David G., and C. Ford Peatross, eds. *Eero Saarinen: Buildings from the Balthazar Korab Archive* (2008).

[43] "H&G's Hallmark House No. 3: A New Concept of Beauty," *House and Garden 115*, no. 2 (February 1959), 59.

[44] Kevin Roche, "Kevin Roche 'in conversation with' Thomas Weaver," *AA Files*, no. 71 (2015), 38.

[45] C. Ray Smith, "ROCHE, (Eamonn) Kevin" in *Contemporary Architects*, ed. Muriel Emmanuel (New York: St. Martin's Press, 1980), 678, quoted in "Kevin Roche: Pritzker Architecture Prize Laureate, 1982," Pritzker Prize, https://web.archive.org/web/20070925192107/http://www.pritzkerprize.com/roche.htm.

[46] Paul Goldberger, "Kevin Roche, Architect Who Melded Bold With Elegant, Dies at 96," *New York Times*, March 2, 2019, https://www.nytimes.com/2019/03/02/arts/kevin-roche-dead-architect.html.

[47] Goldberger, "Architect Who Melded."

[48] John Dinkeloo and Yukio Futagawa, *Kevin Roche, John Dinkeloo and Associates*, 1962-1975 (New York: Architectural Book Publishing Co., 1977).

[49] For a more detailed biographical timeline, see Mateo Kries and Jochen Eisenbrand, eds., *Alexander Girard: A Designer's Universe* (Weil am Rhein: Vitra Design Museum, 2016), 330.

[50] Deborah Lubera Kawsky, *Alexander Girard, Architect: Creating Midcentury Modern Masterpieces* (Detroit, MI: Wayne State University Press, 2018), 5.

[51] Kawsky, *Alexander Girard, Architect*; Oldham and Coffee, *Alexander Girard*; William L. Hamilton, "Design Notebook; Designer to World: Lighten Up," *New York Times*, September 14, 2000, https://www.nytimes.com/2000/09/14/garden/design-notebook-designer-to-world-lighten-up.html; Richard D. Lyons, "Alexander H. Girard Dies at 86; Architect and Interior Designer" New York Times, January 2, 1994, https://www.nytimes.com/1994/01/02/obituaries/alexander-h-girard-dies-at-86-architect-and-interior-designer.html#:~:text=these%20archived%20versions.-,Alexander%20H.,Girard; and Kries and Eisenbrand, *Alexander Girard: A Designer's Universe*.

[52] Kries and Eisenbrand, *Alexander Girard: A Designer's Universe*, 386–432.

[53] Jack Lenor Larsen, "Alexander Girard," *Design Quarterly*, no. 98/99 (1975), 35, JSTOR.

[57] Gregg Bleam, "Dan Kiley: Planting the Grid," in *Preserving Modern Landscape Architecture II: Making Post-war Landscapes Visible* (Washington, D.C.: Spacemaker Press, 2006), 70.

[58] Jane Brown, "Dan Kiley: Miller House, Columbus, Indiana, USA," in *The Master Garden* (New York: Princeton Architectural Press, 2000), 98; Dan Kiley and Jane Amidon, *Dan Kiley: The Complete Works of America's Master Landscape Architect*, 1st U.S. ed. (Boston: Little, Brown, and Company, 1999), 9.

[59] Kiley and Amidon, *Dan Kiley: The Complete Works*, 9-10.

[60] Peter Walker, "Daniel Urban Kiley," in *Shaping the American Landscape: New Profiles from the Pioneers of American Landscape Design Project*, eds. Charles A. Birnbaum and Stephanie S. Foell (Charlottesville: University of Virginia Press, 2009), 171; Kiley and Amidon, *Dan Kiley: The Complete Works*, 10.

[61] Walker, "Daniel Urban Kiley," 171-172; Douglas Martin, obituary for Dan Kiley, *The New York Times*, February 24, 2004; Kiley and Amidon, Dan Kiley: The Complete Works, 10; Gregg Bleam, "Dan Kiley: Planting the Grid," in *Preserving Modern Landscape Architecture II: Making Post-war Landscapes Visible*, ed. Charles A. Birnbaum with Jane Brown Gillette and Nancy Slade (Washington, D.C.: Spacemaker Press, 2004), 70-72.

[62] Douglas Martin, obituary for Dan Kiley, *The New York Times*, February 24, 2004; Walker, "Daniel Urban Kiley,"172.

[63] Walker, "Daniel Urban Kiley," 172; Kiley and Amidon, *Dan Kiley: The Complete Works*, 12.

[64] Kiley and Amidon, *Dan Kiley: The Complete Works*, 12-13

[65] Douglas Martin, obituary for Dan Kiley, *The New York Times*, February 24, 2004; Kiley and Amidon, *Dan Kiley: The Complete Works*, 13.

[66] Kiley and Amidon, *Dan Kiley: The Complete Works*, 20.

[67] Kiley and Amidon, *Dan Kiley: The Complete Works*, 21.

[68] "Walker, "Daniel Urban Kiley"; https://www.tclf.org/sites/default/files/microsites/kiley-legacy/Bio_Kiley.html; Herbert Muschamp, "If Not Utopia, What Is It? The World by Kiley," architecture review, *New York Times*, February 25, 2004.

[69] Douglas Martin, obituary for Dan Kiley, *The New York Times*, February 24, 2004; Kiley and Amidon, *Dan Kiley: The Complete Works*, table of contents; Herbert Muschamp, "If Not Utopia, What Is It? The World by Kiley," architecture review, *New York Times,* February 25, 2004.

[70] "Biography," The Landscape Architecture Legacy of Dan Kiley, The Cultural Landscape Foundation, accessed April 28, 2022, https://www.tclf.org/sites/default/files/microsites/kiley-legacy/Bio_Kiley.html.

[71]"In Memoriam: Daniel Urban Kiley," *Landscape Journal 23*, no. 1 (2004): 83.

[72] Peter Ker Walker, "Recollections," The Landscape Architecture Legacy of Dan Kiley, The Cultural Landscape Foundation, 2013, https://www.tclf.org/sites/default/files/microsites/kiley-legacy/recollections_walker.html.

[73] Kevin Roche to J. Irwin and Xenia S. Miller, memorandums, December 6, 1954, MHG Ia B001 f002 062-064, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields. See also Section 6.16.

[74] According to the National Historic Landmark nomination for the church, "In 1937, William G. Irwin and his sister, Linnie I. Sweeney, purchased the block bounded by Franklin, Fifth, Lafayette, and Fourth Streets, and donated it for the new church.... A church member who was familiar with Cranbrook Academy of Art suggested Eliel Saarinen, the architect who served as its director. Mrs. Hugh Miller [JIM's mother], a member of the building committee, had read a book that characterized Saarinen as Finland's greatest architect, and decided to pursue this recommendation. After making an appointment, Mrs. Miller traveled with her brother to Michigan to meet with Saarinen"; see Laura Thayer, Louis Joyner, and Malcom Cairns, "First Christian Church," National Historic Landmark Nomination Form (Washington, D.C.: United States Department of the Interior, National Park Service, 2001), 10, https://npgallery.nps.gov/NRHP/GetAsset/NHLS/01000067_text Accessed 25 April 2021.

[75] Tabernacle Church of Christ, Building Committee Booklet, c. 1940, quoted in Thayer, Joyner, and Cairns, "First Christian Church," 11.

[76] Tabernacle Church of Christ, Building Committee Booklet, c. 1940, quoted in Thayer, Joyner, and Cairns, *First Christian Church*, 11.
[77] Elsie Irwin Sweeney, "Symbolism of the First Christian Church" (unpublished manuscript in Cleo Rogers Memorial Library Architectural Archive), quoted in Thayer, Joyner, and Cairns, *First Christian Church,* 10.
[78] Laura Tatum, Christine Connolly, Sean Khorsandi, and Mayur Mehta, "Guide to the Eero Saarinen Collection," Yale University Library, September 2006, 46, https://ead-pdfs.library.yale.edu/4418.pdf.
[79] JIM, quoted in Kalins, "This is Irwin Miller," 85.
[80] The Eero Saarinen Collection at the Yale Archives includes correspondence from J. Irwin Miller dated 1949, and the project was given number 5001, suggesting that it was the first project under contract in 1950. The vacation home was project Number 5004; see Tatum, Connolly, Khorsandi, and Mehta, "Eero Saarinen Collection," 10, 71, 73.
[81] Laura Thayer, Louis Joyner, and Malcolm Cairns, "Irwin Union Bank and Trust," National Historic Landmark Nomination, 2000, 8, https://npgallery.nps.gov/NRHP/GetAsset/4fa0109b-7cad-4e9d-8675-7ba35e837dfa.
[82] Thayer, Joyner, and Cairns, "Irwin Bank," 8.
[83] Thayer, Joyner, and Cairns, "Irwin Bank," 8.
[84] Deborah Lubera Kawsky states: "Dan Kiley and Irwin Miller first met at a luncheon at the Palm Café in Columbus in 1955…shortly thereafter Kiley and his family were on their way to the Millers' lake house in Muskoka"; see Deborah Lubera Kawsky, *Alexander Girard, Architect: Creating Midcentury Modern Masterpieces* (Detroit: Wayne State University Press, 2018), 18.
[85] Brenda Showalter, "Cummins to Expand into Former Irwin Building; First Financial to Build Center," *The Republic* (Columbus, IN), October 26, 2010, https://web.archive.org/web/20140607010749/http:/www.therepublic.com/view/local_story/Cummins_and_First_Financial_announcement_at_2_p_m__10_26_2010.
[86] J. Irwin Miller in Xenia and J. Irwin Miller, interview by Jayne Merkel, Columbus, Indiana, June 11, 2002, quoted in Jayne Merkel, *Eero Saarinen* (London: Phaidon, 2005), 154.
[87] J. Irwin Miller in Xenia and J. Irwin Miller, interview by Michael Webb, Columbus, Indiana, June 13, 2000, MHG Ib B021 F222 017-022, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[88] Connie Zeigler, *Xenia Simons Miller: Prairie Modernist, Commercial Article 11* (Indianapolis: Commercial Artisan, 2018), 49.
[89] Zeigler, "Prairie Modernist," 47.
[90] Kawsky, *Alexander Girard, Architec*t, 73-74; Todd Oldham and Kiera Coffee, *Alexander Girard* (Pasadena, CA: AMMO Books, 2015), 338. Kawsky notes that "Girard and Yamasaki, Associated Architects" appears in the title block for the Goodenough House; see Kawsky, Alexander Girard, Architect, 67. Minoru Yamasaki (1912-1986) was a second-generation Japanese American who was able to continue working through World War II, and moved to Detroit after the war, where he became head of design for Smith, Hinchman & Grylls. Establishing his own firm in 1951, his commissions included the World Trade Center and the Pruitt-Igoe housing complex; see Rebecca Binno Savage, "*Minoru Yamasaki, Biography,*" The WSU Yamasaki Legacy, Wayne State University, accessed April 19, 2022, http://yamasaki.wayne.edu/biography.html; and Alexandra Lange, "How to Remember Minoru Yamasaki's Twin Towers," *City Lab*, Bloomberg, September 8, 2021, https://www.bloomberg.com/news/features/2021-09-08/the-history-of-the-twin-towers-design-and-architecture.
[91]"Here is How Alexander Girard Goes About Designing a House," *House & Home*, November 1952, 120-129.
[92] The Vitra monograph claims that "Alexander Girard designed and built Irwin Miller's vacation house in Ontario, Canada in 1952." Todd Oldham and Kiera Coffee, *Alexander Girard* (Pasadena, CA: AMMO Books, 2015), 354.
[93] Though a full inventory of drawings is described, it appears that the drawings themselves were not included in the donation to Yale. See Tatum, Connolly, Khorsandi, and Mehta, "Eero Saarinen Collection." Will Miller, "*Eero and Irwin: Praiseworthy Competition with One's Ancestors*," in Eeva-Liisa Pelkonen and Donald Albrecht, eds., *Eero Saarinen: Shaping the Future* (New Haven: Yale University Press, 2006), 60. Note that Miller was not born until well after Llanrwst was completed.
[94] Will Miller, "Eero and Irwin," 60.
[95] Will Miller, "Eero and Irwin," 60.
[96] Likely with some input from Saarinen, of course. David G. De Long, "Rediscovering Eero Saarinen" in David G. De Long and C. Ford Peatross, eds., *Eero Saarinen: Buildings from the Balthazar Korab Archive* (New York: W.W. Norton & Company; Washington, D.C.: Library of Congress Visual Sourcebooks in Architecture, Design, & Engineering, 2008), 13.
[97] "Entirely Personal: Millers Depart for Canadian Home," *The Evening Republican*, July 14, 1952, accessed April 26, 2022
[98] JIM in XSM and JIM, Webb interview.
[99] JIM in XSM and JIM, Webb interview. Kevin Roche John Dinkeloo Associates were responsible for the reconstruction work, which appears to have been completed in 1997. Job 5004, Miller, J. Irwin Residence, Ontario, Canada in the Finding Aid for Eero Saarinen Collection in the Archives at Yale lists a series of drawings identified as "Kevin Roche John Dinkeloo Associates restoration work" dated 1996;
[100] Laura Thayer, Louis Joyner, and Malcolm Cairns, "North Christian Church," National Historic Landmark Nomination Form (Washington, D.C.: United States Department of the Interior, National Park Service, 2000), https://npgallery.nps.gov/NRHP/GetAsset/NHLS/00000705_text.
[101] Elaine Tyler May, quoted in Pierluigi Serraino, *Eero Saarinen, 1910-1961: A Structural Expressionist* (Cologne: Taschen, 2017), 9-10.
[102] *Modern Architecture: International Exhibition* (New York: Museum of Modern Art, 1932), exhibition catalog, published in conjunction with the exhibition of the same title, organized and presented by the Museum of Modern Art, February 9 to March 23, 1932, https://www.moma.org/calendar/exhibitions/2044.
[103] Michael Sorkin, "Philip Johnson: The Master Builder as a Self-Made Man," *The Village Voice*, October 20, 1978, reprinted in Michael Sorkin, *Exquisite Corpse: Writing on Buildings* (London: Verso, 1991), 8, Google Books; Henry-Russell Hitchcock and Arthur Drexler, eds., *Built in USA: Post-war Architecture* (New York: Museum of Modern Art, 1952), 72-73, 84-85, https://www.moma.org/documents/moma_catalogue_3305_300062118.pdf.
[104] Arthur Drexler, "Post-war Architecture," in *Built in USA*, ed. Hitchcock and Arthur Drexler, 20, 21.
[105]"Case Study Houses 8 and 9, by Charles Eames and Eero Saarinen, Architects," *Arts & Architecture* (December 1945): 51, https://usmodernist.org/AA/AA-1945-12.pdf.
[106] Kyle, "Case Study House #9," 3.
[107] Peter Moruzzi, "Case Study House Program: 1945-1966," National Register of Historic Places Multiple Property Documentation Form (Washington, D.C.: United States Department of the Interior, National Park Services, 2013), sec. E, 4, 6, https://planning.lacity.org/odocument/fe481c26-3e5d-4429-844f-
[108] Barbara Goldstein, introduction to *Arts & Architecture: The Entenza Years* (Cambridge, Massachusetts: The MIT Press, 1990), quoted in Moruzzi, "Case Study House Program," sec. E, 3.

[109] Michael Glickman, "Case Study Celebration," *Architectural Review 186,* no. 1112 (October 1989): 98, quoted in Moruzzi, "Case Study House Program," sec. E, 2.
[110] Elizabeth Gordon, "The Threat to the Next America," *House Beautiful*, April 1953, 250.
[111] Kawsky, *Alexander Girard, Architect*, 65.
[112]"Here is How Alexander Girard Goes About Designing a House," *House & Home,* November 1952, 123.
[113]"Glass House: It Consists of Just One Big Room Completely Surrounded by Scenery," *LIFE Magazine*, September 26, 1949, 96, accessed April 6, 2022,
[114]"Here is How Alexander Girard Goes About Designing a House," *House & Home*, November 1952, 120, quoted in John Comazzi, "Change Over Time: The Irwin Miller House in the Photography of Balthazar Korab," in *Where Do You Stand: 99th ACSA Annual Meeting Proceedings*, ed. Alberto Pérez-Gómez, Anne Cormier, and Annie Pedret (Washington, DC: ACSA Press, 2011), 461, https://www.acsa-arch.org/chapter/change-over-time-the-irwin-miller-house-in-the-photography-of-balthazar-korab/.
[115] "A Contemporary Palladian Villa," *Architectural Forum 109,* no. 3 (September 1958): 127.
[116] Kevin Roche to J. Irwin Miller, letter, December 16, 1953, MHG Ia B001 f002 126-130, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[117] "Contemporary Palladian Villa," *Architectural Forum*, 126-131. The authors of the National Historic Landmark Nomination for the Miller House stated, "The plan that was approved was based on a column grid that divided the space into nine cubics. The configuration recalls Andrea Palladio's 16th century Villa Rotonda"; see Thayer, Joyner, and Cairns, "Miller House," 10.
[118] Rudolf Wittkower, "Principles of Palladio's Architecture," *Journal of the Warburg and Courtauld Institutes 7* (1944): 102-122, Rudolf Wittkower, "Principles of Palladio's Architecture – II," *Journal of the Warburg and Courtauld Institutes 8* (1945): 68-106, JSTOR. Christopher Monkhouse noted that these "ideas developed out of the historical reassessment taking place in the 1950s, of which Saarinen was well aware"; see Monkhouse, "The Miller House," 238.
[119] Colin Rowe, "The Mathematics of the Ideal Villa – Palladio and Le Corbusier Compared," *The Architectural Review 101,* (March 1947): 101-104.
[120] Eero Saarinen, 1958, quoted in Aline Saarinen, ed., *Eero Saarinen on His Work*, a Selection of Buildings Dating from 1947 to 1964 with Statements by the Architect (New Haven: Yale University Press, 1968), 6, as quoted in De Long and Peatross, *Eero Saarinen*, 8.
[121] Kevin Roche, letter to Edgar Kaufmann, Jr. January 27, 1959, quoted in Monkhouse, "the miller house: a private residence in the public realm," *Eero Saarinen Shaping the Future*, note 2, p. 241.
[123] Monkhouse, "The Miller House," 237.
[124] Serraino, *Eero Saarinen*, 13.
[125] "Columbus, Indiana… A Study in Small-Town Progress," *Architectural Forum 103*, no. 4 (October 1955), 160-163. Images of the bank in Architectural Forum were attributed to Hedrich-Blessing; see "Small-Town Progress," *Architectural Forum*, 161.
[126] Cynthia Kellogg to J. Irwin Miller, letter, July 31, 1957, MHG B001 f008 067-068, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[127] J. Irwin Miller to Cynthia Kellogg, letter, August 9, 1957, MHG Ia B001 f008 070, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[128] J. Irwin Miller to Alexander Girard, letter, August 9, 1957, MHG Ia B001 f008 069, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[129] Comazzi, *Change Over Time*, 464.
[130] Margalit Fox, "Ezra Stoller, Who Captured Modern Buildings, Dies at 89," *New York Times*, November 2, 2004, https://www.nytimes.com/2004/11/02/arts/design/ezra-stoller-who-captured-modern-buildings-dies-at-89.html#:~:text=Ezra%20Stoller%2C%20a%20celebrated%20architectural,He%20was%2089.
[131] Pierluigi Serraino, quoted in Kenneth Caldwell, "A Space of Perceptual Stillness: How Ezra Stoller Photographed Modernity," *Metropolis*, January 28, 2020, https://metropolismag.com/viewpoints/how-ezra-stoller-photographed-modernity/. Serraino also pointed out that "what was possibly less widely recognized…was the counter-dependency of architecture on its photography, which was necessary for the discipline to be apprehended and assessed at a global scale and, maybe even more importantly, remembered by a future audience."
[132] Alexander Girard to J. Irwin Miller, letter, February 19, 1958, MHG Ia B002 f011 060, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields. J. Irwin Miller wrote the following to Girard on February 27, 1958: "Regarding the cost of the album of photos – since this is primarily for record purposes, not for display as a work of art, I think we should keep it much simpler than a $300 or $400 item, for I imagine that will rest for most of its life in our files here at the office"; see J. Irwin Miller to Alexander Girard, letter, February 27, 1958, MHG Ia B002 f011 059, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[133] George Newlin to JIM, March 3, 1958. MHG_Ia_B002_f011_031.
[134] Newlin to JIM, March 3, 1958. MHG_Ia_B002_f011_031
[135] Wanda Henderson to J. Irwin Miller, letter, February 5, 1958, MHG Ia B002 f011 090, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields. Several accounts mention that loose furniture around the fireplace had been removed, and other furniture was positioned particularly for the photos. Will Miller recounted that "The Stoller photo of the Living Room is a classic case of him rearranging the furniture. The Eames bench and the long coffee table designed by Girard were never in those locations. The small side table and the Womb Chair are in their proper locations. The Bedroom photo has less rearrangement. The Womb Chair appears to have been pulled out of the corner so it could be in the shot and the long table moved to create room for the Womb Chair." Will Miller, email to Shelley Selim, February 6, 2019.
[136] Ezra Stoller to George Newlin, letter, April 19, 1958, MHG Ia B002 f011 004, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields. In the same letter, Stoller said that Architectural Forum would send him back through Columbus after May 15. This and the fact that some of the views in Architectural Forum show much heavier vegetation than others, suggesting that this indeed occurred, though the authors of the CMP have located no reference for the visit. Also, Will Mehlhorn of *House and Garden* had mentioned the following in a letter to the Millers: "I was at the house for a day last summer with Mr. Stoller at a time when you were both, unfortunately, in Canada"; see Will Mehlhorn to J. Irwin and Xenia S. Miller, letter, December 5, 1958, MHG Ia B002 f010 013-038, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[137] J. Irwin Miller to Eero Saarinen, letter, April 15, 1958, MHG Ia B002 f011 012, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[138] "Contemporary Palladian Villa," *Architectural Forum*, 126-131.
[139] Richard A. Miller to Alexander Girard, letter, April 29, 1958, MHG Ia B002 f010 142-143, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields. The author for the article is not noted, but Richard A. Miller, Associate Editor, had handled correspondence with Girard.
[140] "Contemporary Palladian Villa," *Architectural Forum*, 127.
[141] "New Concept of Beauty," *House and Garden*, 58-77, 100-101, 110-112.
[142] "New Concept of Beauty," *House and Garden*, 58.
[143] "New Concept of Beauty," *House and Garden*, 58.

[144] "New Concept of Beauty," *House and Garden*, 58-59.
[145] Will Mehlhorn to J. Irwin and Xenia S. Miller, letter, December 5, 1958, MHG Ia B002 f010 013-038, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields. Correspondence between Miller and Saarinen references an article in Holiday Magazine but, if published, this has not yet been located; see J. Irwin Miller to Eero Saarinen, letter, April 15, 1958, MHG Ia B002 f011 012, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[146] "Etas-Unis: Une demeure concue par un des grands architects contemporains [A Dwelling Conceived of by one of the Great Contemporary Architects]," *L'Oeil 94,* October 1962, 66-71, collection of Ben Wever. MH&G was also published in "Eero Saarinen, Miller House," in Yukio Futugawa, ed., "Houses in U.S.A," *Global Interior no. 1* (1971), pp. 114 – 115. No copy of the publication was available at the completion of the report.
[147] "Etas-Unis: Une demeure," *L'Oeil*, 67.
[148] Comazzi, *Change Over Time*, 458.
[149] Comazzi, *Change Over Time*, 458.
[150] David W. Dunlap, "Balthazar Korab, Architectural Photographer, Dies at 86," *New York Times,* January 26, 2013, https://www.nytimes.com/2013/01/27/arts/design/balthazar-korab-architectural-photographer-dies-at-86.html#:~:text=Balthazar%20Korab%2C%20one%20of%20the,-confirmed%20by%20his%20wife%2C%20Monica; "Small-Town Progress," Architectural Forum, 158-165.
[151] Comazzi, *Change Over Time*, 458.
[152] Dunlap, "Balthazar Korab"; Balthazar Korab Collection, Library of Congress Prints and Photographs Division, Washington, D.C., https://www.loc.gov/item/2011645089/.
[153] Christopher Monkhouse interviewed by Amy Wimmer Schwarb in "Modern Family: The Miller Home," *Indianapolis Monthly*, May 2011, https://www.indianapolismonthly.com/arts-and-culture/modern-family-the-miller-home .
[154] Identified as "Life Magazine Images," these files are listed as ARC_MHGC_LIFEMagazine_1961_001 through ARC_MHGC_LIFEMagazine_1961_020, Newfields Archives.
[155] Marilyn Wellemeyer, "An American Renaissance," *LIFE Magazine 63*, no. 20, November 1967, 74-81, collection of Ben Wever.
[156] Wellemeyer, "An American Renaissance," 74.
[157] J. Irwin Miller, quoted in Dorothy Kalins, "This is Irwin Miller," *Town & Country 128*, no. 4621, July 1974, 85, ProQuest. More info on this would come from a review of Girard and Saarinen papers, which was beyond the scope of the CMP.
[158] JIM, quoted in Kalins, "This is Irwin Miller," 85.
[159] JIM, quoted in Kalins, "This is Irwin Miller," 85.
[160] "The Cummins Foundation," https://columbus.in.us/cummins-foundation/ accessed 26 May 2022 and Kriplen, p. 7-8 and 80-82.
[161] United States of America Embassy, Grovesnor Square, National Heritage List for England, https://historicengland.org.uk/listing/the-list/list-entry/1393496?section=official-list-entry accessed 1 June 2022.
[162] JIM, quoted in Kalins, "This is Irwin Miller," 85.
[163] JIM, quoted in Kalins, "This is Irwin Miller," 85.
[164] JIM, quoted in Kalins, "This is Irwin Miller," 85.
[165] "Modernism in Architecture, Landscape Architecture, Design and Art in Bartholomew County, Indiana, 1942-1999," National Historic Landmark Theme Study (Washington, D.C.: United States Department of the Interior, National Park Service, 2000), https://www.nps.gov/subjects/national-historiclandmarks/upload/Columbus-FINAL-FOR-PRINTING-508-Compliant.pdf, p. 3.
[166] "Small-Town Progress," *Architectural Forum,* 159-165. These and other articles are cited in "Modernism in Architecture, Landscape Architecture, Design and Art in Bartholomew County, Indiana, 1942-1999." The significance of Columbus as an example of civic improvement through exemplary design is reiterated in the following articles published in the 1970s and 1980s: Beverly Russell, "America Discovers Columbus," *House and Garden 148*, no. 7, July 1976, 80-83, 103; David Jeffery and J. Bruce Baumann, "A Most Uncommon Town: Columbus," *National Geographic Magazine 154*, no. 3, September 1978, 382-397, National Geographic Magazine Archive, 1888-1994; Edna Thayer, "Columbus, the Gem of Architecture," *Horizon: A Magazine of the Arts 25*, no. 3 (April 1982): 24-31.
[167] James A. Michener, *James A. Michener's USA: The People and the Land* (New York: Crown Publishers, Inc., 1981), 177.
[168] "AIA Ranks Columbus, Indiana as US's 6th Most Architecturally Important City," *ArchDaily*, December 4, 2012, https://www.archdaily.com/299356/aia-ranks-columbus-indiana-as-uss-6th-most-architecturally-important-city.
[169] "The Cummins Foundation," https://columbus.in.us/cummins-foundation/accessed 26 May 2022 and Kriplen, p. 7-8 and 80-82

3
Context: Design and Construction History

3 DESIGN AND CONSTRUCTION HISTORY

3.1 DESIGNING THE MILLER HOUSE

After World War II, the Millers moved into what Will Miller described as a "'center-hall Colonial'" overlooking the Flatrock River on 19th Street in Columbus, Indiana (Fig. 3.1).[1]

Fig. 3.1 Miller Family home from 1945—1956, Columbus, Indiana. Date: 1950. Photo credit: Francis Trevelyan Miller, LIFE Photos Archive

In the fall of 1952, with Llanrwst completed and the bank still in design, J. Irwin Miller and Saarinen walked a ten-acre agricultural site on the outskirts of Columbus. On May 25, 1953, JIM sent both Saarinen and Girard letters advising that he had purchased the land and wanted to talk with them about building a house, commenting to Girard: "I think we will have a good deal of fun working this out."[2] Girard responded with equal enthusiasm: "I will certainly be most interested in doing work anywhere in this country, or even abroad, where there would be a chance to contribute to the advancement of living. I would count a house for you and Xenia definitely in this realm."[3]

On July 8, 1953, JIM wrote to George Newlin, head of Irwin Management and ultimately the manager of the House project, sketching out what he envisioned would be the timeline for the house:

> 1. This summer, Xenia and I will make up our minds as to how many and what kind of rooms we want in the house.
> 2. In September, Eero and Sandro Girard will come to Columbus to commence work on the preliminary layouts, and by that time the topographical map should be complete in all details.
> 3. Along about next spring, all of this should be settled and construction should commence in May or June.[4]

Neither correspondence nor drawings between the client and designers exist to document what happened over the six months between the initial intent to purchase and December 1953. What is currently known about the Millers' requirements, and the designs presented during that period, comes primarily from interviews with them made several decades later. Connie Zeigler points out in "Xenia Simons Miller: Prairie Modernist" that the Millers had already exchanged ideas for their "dream house" through correspondence during World War II.[5] Then, XSM mused: "'Grampa [her pet name for Miller], can you picture a very, very modern house with huge front windows, a flat roof top, built of something beige color, coming out from under the trees at the edge of the woods on our hill? Hm. Inside live Gramma and Grampa and all the little Millers snug as bugs in a rug.'"[6] It was a remarkably accurate, if somewhat simplistic, description of the house that they built.

About a year after the family moved into the House, JIM wrote the following to *House and Garden* editor Will M. Mehlhorn:

> In working with the architects, Mrs. Miller and I made complete detailed studies of all space, storage, and other requirements as contained in our former house, individual additions needed to make them satisfactory, and forecasted future requirements. I feel for a successful house it is necessary that the clients do a great deal of work in order to provide the architect with the basic information he must have to do an intelligent job.[7]

Their attention to detail was characteristic of JIM's approach to all of his endeavors, and certainly benefitted from XSM's experience with specifications and plans in her earlier role in the Cummins Engine Company Purchasing Department. In addition to the specifics of family needs, Will Miller noted, "Miller and his wife wanted a place to entertain business guests from around the world without sacrificing a good environment in which to raise their children."8 Cummins Engine Company was becoming an international corporation, yet Columbus had no good hotels or restaurants at the time.[9]

In later interviews, the Millers gave more emphasis to the flexibility of the house than the more practical and personal details. XSM said: "I asked Eero, 'What happens when our children grow up and leave, won't we rattle around?' He said, 'No, by closing this door and the one by the living room you can eliminate the entire wing.' Instead I moved in; we use all of it still, it's wonderful!"[10]

On September 12, 1953, XSM's datebook noted: "'Eero, Sandro here to talk on house.'"[11] Typically, Saarinen said that he began any commission "by considering very carefully the problem of the site, the problem of the program, and the problem of the spirit of the particular job."[12] He then reportedly produced "almost a dozen schemes before they found the right one."[13] It is difficult to determine how many schemes were actually produced or what they looked like from the descriptions given later by the various participants, but all agreed that the process was one of trial and error. Below are a few descriptions detailing the design process:

> "The first design was on stilts in the woods among the mosquitos. I turned that down without looking at it."[14]—XSM

> "One [scheme] located the house on a sand bar in the river, with three sides surrounded by earthen 'berms' and only one open to the landscape. It was quickly dropped as unbuildable."—Interview by David Dillon with JIM and XSM, September 24, 1996[15]

> "Then we moved up to this level [close to the street]... . He did put in a berm, which we didn't like. I wanted to walk straight in."[16]—XSM

> "A later, more minimalist design showed a house on stilts in the river flood plain. ... 'We told Eero we didn't want to live in a tree house.'"[17] —XSM

> "A third proposal called for the house to be partially sunken into the slope, following the same basic plan as the house that was finally built except for smaller windows. The Millers found it too gloomy."—Interview by David Dillon with JIM and XSM[18]

> "'I don't know that we ever used the words modern or contemporary, but we wanted the house to grow out of Columbus, which is flat and on a grid. A curvy design on this landscape wouldn't have looked right.'"[19]—JIM

> "'We never told Eero or Kevin what to do, but we always felt free to send them back to the drawing board if there was something we didn't like.'"[20]—XSM

By December of 1953, the concept of "Girard's modules"—9-foot by 12-foot-9-inch rectangles that accommodated the various functional areas—was understood by all. With them emerged the approximate size of individual rooms, but the team still assumed that the House would be three-stories high.[21] On March 10, 1954, Saarinen penned a triumphant report to Girard *en route* to Michigan after a meeting with the Millers. Given how many times Saarinen had been sent "back to the drawing board," his sense of relief is easy to understand:

> The Millers liked the general scheme of the house. They liked the one story concept. They liked the wide overhang and they liked the flat roof with a plenum space in it. ... They liked the general degree of formality—informality inherent in the house. They seem to appreciate the idea of having the earth built up around the house and they also liked the general disposition and grouping of parts. In an overall way I am enthusiastic about their response because I feel there is a genuine feeling on their part that it is for them, and I have a feeling also that nothing is "put over" on them, but simply right for them. The low unmonumental character they liked. They will now go over the plans with a fine-tooth comb and make a long list.[22]

JIM confirmed their satisfaction, writing to Girard on March 19, 1954 with a copy to Saarinen:

> We have been studying the plans now for the past week, and... we are delighted with the general scheme and congratulate

> both of you on expressing so well what we want in our house. ...You have a couple of very happy clients here who feel that you and Eero have exceeded our expectations in the general conception embodied in this plan.[23]

The Millers' delight did not prevent them from following up with a long, remarkably detailed list of questions and concerns. These ranged from "Will [the Living Area] seem sufficiently warm and intimate when inhabited by only four or six people?" and "Is it open sufficiently to outside, or will one feel as if living in basement and looking out through tunnels?" to "Where does milkman leave and pick up bottles?" and "At big hen parties, where do ladies leave their coats?"[24]

JIM was also concerned about the cost. Using a budget of $20 per square foot, Saarinen's office estimated that "the cost including some of the outside work is something near $200,000 without including anything for fees or furniture, and this is more than they have intended to spend."[25] JIM told Girard: "I would try to reduce total number of square feet by at least ten per cent and see how we come out."[26]

3.2 DESIGN PRINCIPLES

Connecting the design of the building, landscape and interiors were a few overarching design principles, which are described here. The ways in which the concepts were developed by each designer and in each part of the site are described in greater detail in the sections on understanding the buildings, landscape and interiors and collections which follow (Sections 6, 7, and 8).

3.2.1 Design Unity

Underpinning the individual, particular character-defining elements throughout the Miller House and Garden (discussed in Sections 6, 7, and 8) is the site's comprehensive design, and the interrelationship of all parts to the whole. One of the most widely circulated quotes related to Saarinen's design philosophy was his following statement:

> I think of architecture as the total of man's man-made surroundings. ...It is the total of everything we have around us, starting from the largest city plan, includes the streets we drive on and its telephone poles and signs, down to the building and house we work and live in and does not end until we consider the chair we sit in and the ash tray we dump our pipe in.[27]

Kiley and Girard shared Saarinen's core design values, as well as the collegial work method that embraced the contributions of all disciplines. As noted in Section 2.7, JIM also embraced the concept; from its inception, the Cummins Foundation stipulated that, in order for building projects to receive funding, "the architect selected was to be given control over everything from site planning to draperies—as well as future additions."[28] For decades after the completion of the house, the Millers continued to engage all three designers or their offices to undertake repairs or renovations, creating a remarkable unity across not only disparate disciplines and space but also time.

3.2.2 Modularity and the Grid

In December 1953, three months before the final design concept was presented to the Millers, Kevin Roche sent a tabulation of "Mr. Girard's module listings" to JIM, identifying a module of 9 feet-0 inches by 12 feet-9 inches for planning.[29] Major program elements, both "Service" (such as the Main Entrance and Dining) and "Non-Service" (Garage and Kitchen), were assigned full or partial modules associated to create a tally of the total area.[30]

The larger, rectangular modules were imposed on a uniform grid comprised of 2 feet-6 inch squares that were grouped within nine structural bays. The overall plan of the house is rectangular, with the three center modules, containing the entrance and Living Room, measuring 27 feet-6 inches x 37 feet-6 inches and the modules on either end measuring 27 feet-6 inches x 32 feet-6 inches. The modules form four rectangles, each distinct in size, which pinwheel around the central living space. The landscape is also organized with modules or grids, though these vary depending on the function of the space and the appropriate distance for various tree species.

Modularity was a concept common to both classical design and Modernism and thus would have resonated with JIM, who majored in Classics at Yale.[31] Roche's reference to "Mr. Girard's module" suggests that Girard was responsible, yet in a session on "The Changing Philosophy of Architecture" at the 1954 convention of the American

Institute of Architects, Saarinen declared that:

> The Renaissance was greatly concerned with the human response to proportions. Not long ago I would have said this was of lesser importance. Today I begin to see its profound importance. The proportions of our architecture will be different from the Renaissance. They will grow from our own principles—our own structure and form and space.[32]

The employment and expression of a square grid was promoted in the early twentieth century by Modernist architects Mies van der Rohe and Le Corbusier as well as painters such as Mondrian. A year earlier, Saarinen had noted both Frank Lloyd Wright's "new concept of space as free and fluid" and "his recognition of modular design as a logical device through which one could take advantage of standardized parts."[33]

3.2.3 Privacy

Setting the house a full block from Washington Street, placing the auto approach from a side street rather than the main road, the single-story massing—all these were strategies that helped the Miller House recede from the public landscape. The dense arborvitae hedge along Washington Street provided privacy, as did orienting the house plan to screen views of the front door.

Within the house, the semi-private spaces—Entry, Dining Room and Den—bridge the interior and exterior. Each distinct in character, they form the "pinwheel" that gives the house a dynamic spatial quality quite different from the more uniform glass boxes.

The simplicity of massing and articulation was contradicted by the elegant materials and precise detailing. The public demeanor of JIM and XSM was modest and unassuming, consummate mid-westerners. As Christopher Monkhouse noted:

> Despite their desire for a low-key, private home, the Miller House ends up being an essay in modernist inconspicuous consumption. Fiberglass Knoll furniture turns to stone. ...The storage wall is not an Eames Storage Unit in molded plywood, but an elegant response made of rosewood. The elements are the same, but the materials give the house a glamour rarely part of Saarinen's (or Girard's) vocabulary. Was invention driven within by the need for privacy? Did Saarinen choose a style for the job he thought would suit the town's leading citizen?[34]

With regard to the MH&G, Kiley confided in his *Complete Works* that "it was understood from the beginning that although a private residence, this project operated within the standards of the public realm, and that our work would not be an isolated incident, but would travel through posterity as an element of the greater assemblage of Columbus' modern architecture."[35] *House and Garden* noted, "Formality and informality meet happily in this house. The grandeur of the materials and reticence of design may have a formal connotation. But nothing was chosen for show. Everything is designed to make living as pleasant as possible."[36]

3.3 CONSTRUCTION

Four months later, in July 1954, JIM contacted Girard to say, "I hope we are making speed on the drawings, for I am most anxious for early letting of the bids while contractors are still relatively hungry."[37] At that point, drawings were expected at the beginning of November, but final drawings and specifications were not provided to "five selected contractors" until mid-February of 1955, with bids due a month later.[38]

The final list of bidders included: Lawrence Dain of Anderson, Indiana; W.R. Dunkin and Son, Anderson, Indiana; and "two local contractors."[39] Joseph Lacy, the business manager in Saarinen's office, had reviewed options with Miller in January 1955. Charles R. Wermuth & Son, who had built the Tabernacle Church of Christ , declined to bid, as Lacy relayed to JIM: "He has nothing going on nearby and cannot compete with local bidders."[40] Lacy also forwarded a letter from Thomas C. Dorste, who appears to have acted as local architect for Saarinen and had been asked to provide references for three additional contractors suggested by Miller.[41] Dorste characterized them as "well known here and competent and qualified people," but cautioned that all were "Designer-Builders" and "none of these firms understands contemporary architecture in even the most superficial sense."[42] He also noted: "This would not be a problem with a contracting firm, but a 'designer-contractor' usually has his own opinions."[43] Lacy and Saarinen's

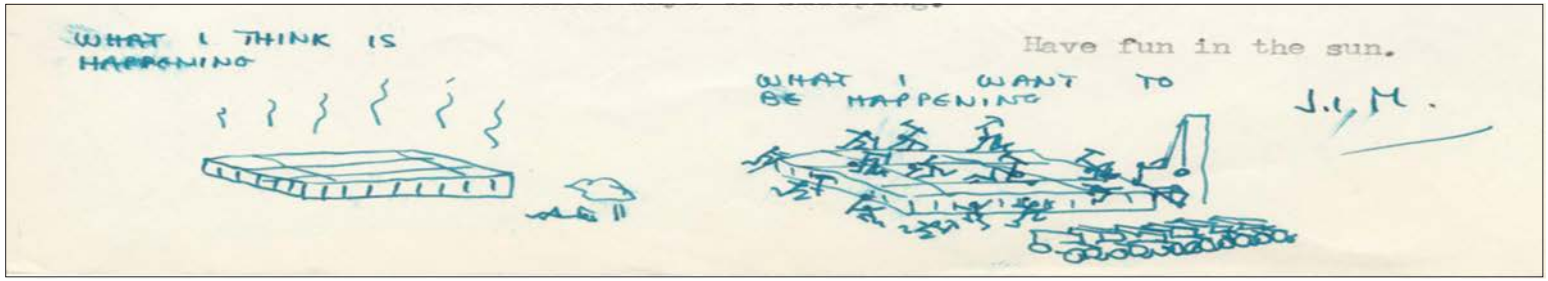


Fig. 3.2 J. Irwin Miller sketch regarding concerns about construction progress. Date: July 6, 1956. Photo credit: MHG_Ia_B003_f018_035, Miller House and Garden Collection (M003), Newfields Archives

office agreed, and the firms were eliminated from consideration.[44] The project was ultimately awarded to Taylor Brothers Construction Company on April 18, 1955 in the amount of $352,800—close to double JIM's anticipated budget.[45]

Taylor Brothers Construction Company began as Foss and Luke Taylor Contractors and Builders, established by twin brothers in 1932.[46] From the shop the two former carpenters built at California Street, they advertised the following: "Best woodworking equipment for all kinds of millwork. Everything in building materials. Lowest prices for cash. General contracting, estimates cheerfully given."[47] During World War II, the company "converted their shop into a war materials processing operation, packaging and crating locally made products [such as Cummins diesel engines] for overseas shipping."[48] After the war, "the return of Foss's two sons-in-law and Luke's two sons enabled the brothers to form two separate companies. One of these was Taylor Bros. Construction Company," the other was Taylor Lumber and Supply.[49]

The project was managed for the Millers by the staff of Irwin Management. George Newlin (1917–2005), worked for Cummins Engine Co. during World War II, and later served as the president of Irwin Management, retiring in 1985."[51] Owen D. Hungerford of Irwin Management was also involved in the project—and generated many of memos, especially after construction was completed, now collected in the archives.

Not surprising given the brisk schedule that JIM had envisioned, delays were a concern from the start. On July 21, 1955, George Newlin made a request to Tom Dorste for a "time table" for the House—apparently promised earlier—and confided, "The next time you are down to inspect the job, I would like to go over it with you since off the record, JIM is concerned that it is not moving along as well as it might."[52] In September, JIM wrote the following update to Girard: "The house is pretty well along, except that it hasn't gone up in the air yet. I believe that all the work has been done that can be until the steel arrives."[53] While travelling to Canada in July 1956, more than a year after construction had started, the witty but impatient JIM illustrated his request for weekly updates from Newlin with sketches that compared "what I think is happening" with "what I want to be happening" (Fig. 3.2).[54]

Several factors appear to have contributed to the prolonged construction process:

- Saarinen's office was very busy. Though construction documents were completed in February 1955, Larry Hoffman of Irwin Management reported that Saarinen's office was still working on the design of the fireplaces in August 1956, a year-and-a-half later (Fig. 3.9).[55] The drawings inventory in Newfields Archives includes over 40 SK (sketch) drawings issued between June 1955 and December 1957. Saarinen's office had commissions underway for U.S. embassies in Great Britain and Norway as well as major buildings for the University of Chicago, Yale University, IBM and TWA.
- The post-war building boom brought materials shortages everywhere. The sliding doors and thermal windows, were relatively new technologies that had to be shipped from both the East and West Coasts. The doors, manufactured in Los Angeles by Glide Windows, Inc., were a particular problem. Correspondence from Virgil Taylor in September 1955 documented at least 10 letters sent since June requesting shop drawings and

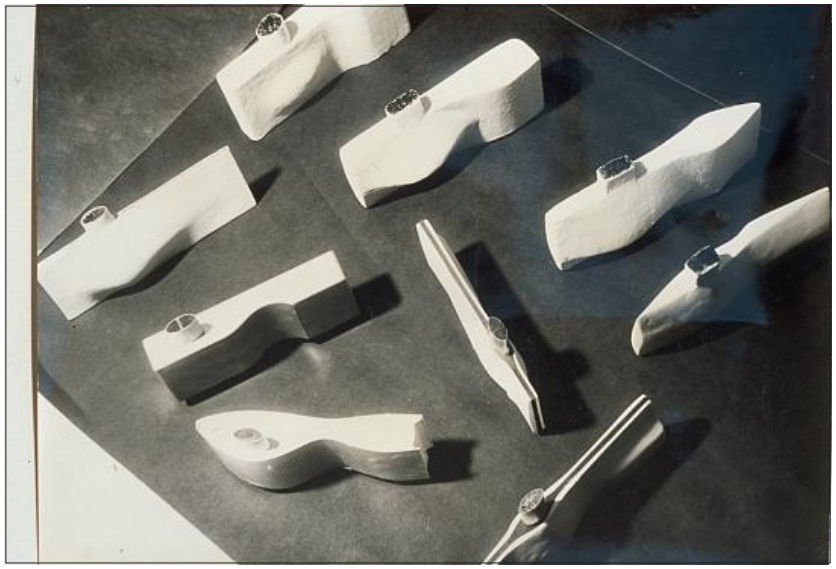


Fig. 3.3 Models of fireplace designs. Date: 1953-1957. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00362

other technical information, and stressed the importance of installing the doors the first week in November 1955 in order to keep to the schedule.[56] Staff from the Cummins Engine Company office in Los Angeles got involved, reporting to JIM in early November 1955 that "[Glide Windows] have a good looking shop, in the neighborhood of 180 employees but appeared to be exceptionally busy with indication that the sales had grown faster than their ability to handle."[57] The doors arrived on site in September 1956, but were deemed "not acceptable."[58] Though John Dinkeloo went to California in October 1956 to inspect the doors, the final shipment was not received until August of 1957.[59] As a result, interior finishes could not be installed that winter and a letter from Roche to JIM dated October 4, 1956 references a request for extras related to painting steel "caused by exposure when lack of aluminum windows and Glide doors made impossible to paint last winter."[60]

- The level of craftsmanship demanded was well beyond what was customary for a typical American house, especially one located in a small community with a limited number of craftspeople. Saarinen's office had tried to anticipate this by including structural steel, windows and skylights in the
- "Ornamental Metal" section of the specifications, rather than in the more typical categories and emphasizing to potential bidders that "it is intended that the class of work desired be of a higher quality than required for miscellaneous metal."[61]
- Certain critical subcontractors, such as plaster and terrazzo, were brought in from Indianapolis, and Newlin reported that Virgil Taylor didn't have much leverage to compel subcontractors from Indianapolis to come to the site as it was "a one-shot deal" with Taylor Brothers.[62]
- Local subcontractors, on the other hand, seemed concerned about the long-term damage to their reputation that could ensue if they worked for JIM and failed to meet his standards. In September 1956, Newlin reported: "Mr. Devening, the concrete slab man...does not feel he can give the degree of accuracy and perfection being required in your house."[63] In particular, he was nervous about installing slabs over the radiant heating pipes, "afraid that the inside slabs will crack over the radiant heat pipes" and "would necessitate his constantly replacing them."[64]

Despite JIM's understandable frustration, Saarinen's office urged patience. Newlin reported to JIM in the summer of 1956: "Mr. Roche told me very frankly that Virgil is doing a very good careful job of workmanship, and he really didn't want to push him much more on speed, because the workmanship might suffer."[65] The contract originally stipulated completion by July 31, 1956.[66] That date passed and the Millers had hoped to move in before Christmas of that year, but Newlin reported even that seemed unlikely after a site meeting early that month that involved Kevin Roche and Leon Yulkowski from Saarinen's office, Alexander Girard, Tom Dorste, Virgil Taylor, Foss Taylor and Lee Ballou. In a memorandum to JIM dated December 4, 1956, Newlin stated:

> The morale of these latter three gentlemen [Virgil Taylor, Foss Taylor, and Lee Ballou] is extremely low. Whether or not they are justified, all three of them feel that they have done the very best they know. I am sure they feel much abused that we are not

pleased. Any pressure on specific items is met with a listing of those items on which they have waited and waited for drawings.

Ultimately, the extended construction, disagreements over standards of workmanship and work that occurred out of sequence caused requests for extra costs and change orders. The final construction cost is not known, but the project may have been the crucible which forged JIM's philosophy, often quoted in relation to the work of the Cummins Foundation: "Buildings cost the same whether they're well done or not. It doesn't take a lot of money but it does take a lot of time."[67] Ultimately, the Millers were delighted with the result. JIM wrote to House and Garden editor Will M. Mehlhorn: "For your own information, additional features of this house which are exceptionally pleasing to us are the very high quality of workmanship obtained by the contractor and the excellent engineering which have produced utilities and ventilation of a quality beyond anything we had hoped for."[68]

3.4 THE MILLER HOUSE LANDSCAPE

Dan Kiley was a core figure in the first generation of Modernist landscape architects. His extensive career of work is anchored in many ways in his work on the Miller House landscape design. Known for rejecting the formalism of Beaux-Arts design for the different formalism of Modernism, Kiley's elegant interweaving of geometries and close integration of landscape and architecture make him a paragon of Modern landscape architecture. Kiley's litany of influential works spans public work at the civic scale and domestic landscapes, in every instance foregrounding landscape design as creation of space, not simply locating plants or making horticultural scenes.

Kiley had of course collaborated with Saarinen before the Miller House project: in government service during World War II, on the Jefferson Gateway Arch in St. Louis, on downtown Columbus' Irwin Union Bank and Trust. Kiley joined the project in 1955 after the House was largely designed and under construction. He immediately connected with JIM and XSM as well. In a 1955 letter to the Millers following up on their first meeting, in Columbus, Kiley reported on a meeting with "Eero and Kevin" and confirmed everyone's agreement on some of the core features of the design (staggered hedges, the plinth surrounding the house) and some of the details that would soon emerge (plant choices, and the need for a "Blooming Chart" and "Maintenance Chart").[69]

As summarized by Gary Hilderbrand, a leading landscape architect and writer on Kiley's work, "The Millers' program [to Kiley] was brief and basic: privacy without walling out the neighbors; a concealed private entrance; color in the spring and fall, when they were in residence; a design that fit the place and that differed from both their lake house in Canada and their non-descript ranch house in Columbus."[70] Kiley's scheme was broadly structured by two decisions made before he was involved in the project: first, the configuration and context of the original 10-acre parcel purchased by the Millers, spanning from Washington Street to the Flatrock River, encompassing riverbank, floodplain and slightly elevated bench; second, the siting of the house which, as noted above, resulted from Saarinen creating multiple schemes in conversation with the Millers in 1953-1954.

The design and realization of the landscape is centered on the House and extends the House's spatial logic. When Kiley started work, Saarinen and the Millers had already considered and dismissed multiple site plan scenarios, and by 1953 they had established the parti of the House and had gotten started with construction.[71]

The House was sited on a natural platform to the east of the property, higher than the Meadow, which slopes down the stream (dramatically, just west of the Honey Locust Allée, much flatter thereafter). The designed landscape adjusted deftly to what pre-existed it.

The sense of the House as a "temple on plinth" is apparent on the west side, facing the Meadow and a distant forested edge; on the other, garden-facing side of the House, multiple layers of Kiley's carefully constructed "rooms" buffer and connect to the domestic spaces without walling them off. The landscape rooms between the House and Washington Street are strongly ordered yet share the House's relative lack of hierarchy. Where's the front door? Where's the destination garden? These complexities are purposeful results of the careful spatial balance and play of light and solid resulting from Kiley's careful design extending from Saarinen's composition of the House.

The overall structure of Kiley's landscape design was tripartite, accepting the site's topography and siting of the House. In the words of Kiley's associate Gregg Bleam, the site was organized as "garden, meadow, and wood."[72] The pinwheeling of the House's plan was extended by Kiley in a pinwheeling approach to the garden spaces,

which Kiley referred to as “rooms.”[73] Each room, composed from spatial elements (allées, hedges, ground cover, object trees, lawns, etc.), has its own character and functions. Many of them spatially flow from interior room to garden room: Adult Garden on the north, connected visually and functionally to JIM and XSM’s private domains; Children’s Garden to the south, connected to the children’s wing; entry and service functions to the immediate east; and distant, private, destination views to the west for entertaining. The spaces are distinct yet merge easily into one another. As Kiley himself described it in retrospect, “Much like Eero’s concept for the house, each area, or ‘room’, has its own programme (orchard, children’s lawn, recreation), yet all are bound together in a loose, dynamic order of spatial flow.”[74] The plinth on which the House sits was originally to extend 25 feet from the House walls; Kiley reduced it to 10 feet so the landscape rooms and relationships could begin closer to the edge of the House (just 2 feet, 6 inches from the roof overhang) and thus be more intimately connected to interior spaces and functions.[75]

The inventive use of grids is a hallmark of Kiley’s work and resonated with JIM as well: “We wanted the house to grow out of Columbus, which is flat and on a grid.”[76] The overall organization of the landscape is planned around intersecting grids, modular and ordered though not rigidly symmetrical. Kiley used the ordering and clarity of grids and planes without submitting to literal symmetry or axiality: “grids were used throughout the garden, many inconsistent with one another.”[77] Slight asymmetries within garden rooms, and in spatial relationships between architectural and landscape spaces, make the composition dynamic.

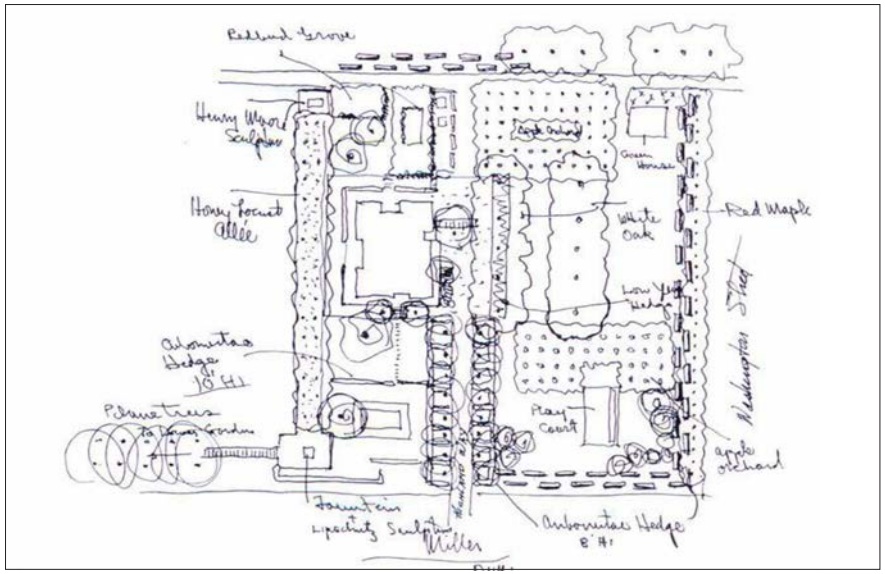


Fig. 3.4 Kiley’s hand sketch of House precinct gardens. Date: n.d. (but after 1977, before which both Moore and Lipchitz sculptures were added); Credit: Kiley & Amidon, 1999, 20.

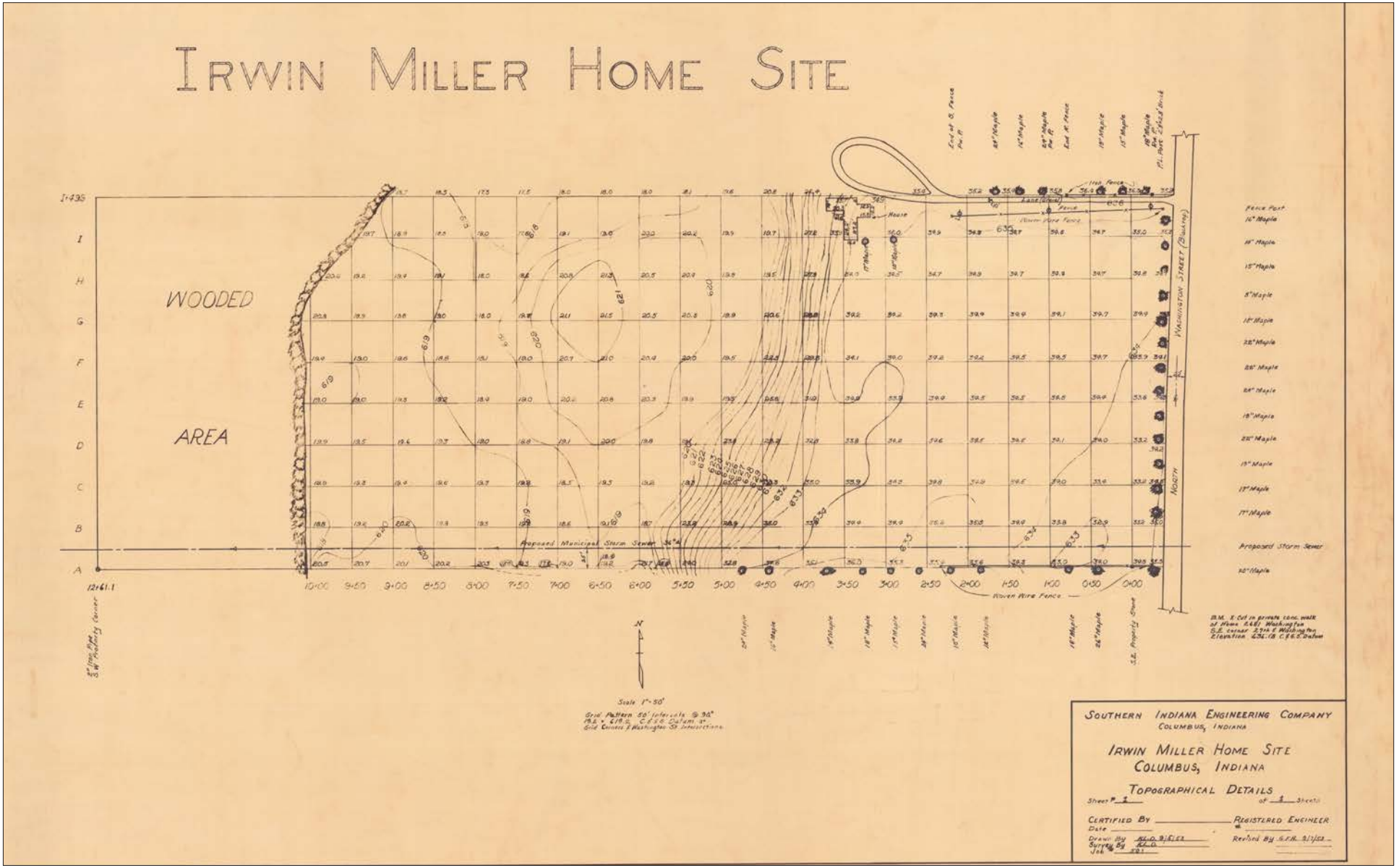


Fig. 3.5 Topographic survey, pre-design. Date: 1953. Photo Credit: Miller House and Garden Collection (M003), Newfields Archive

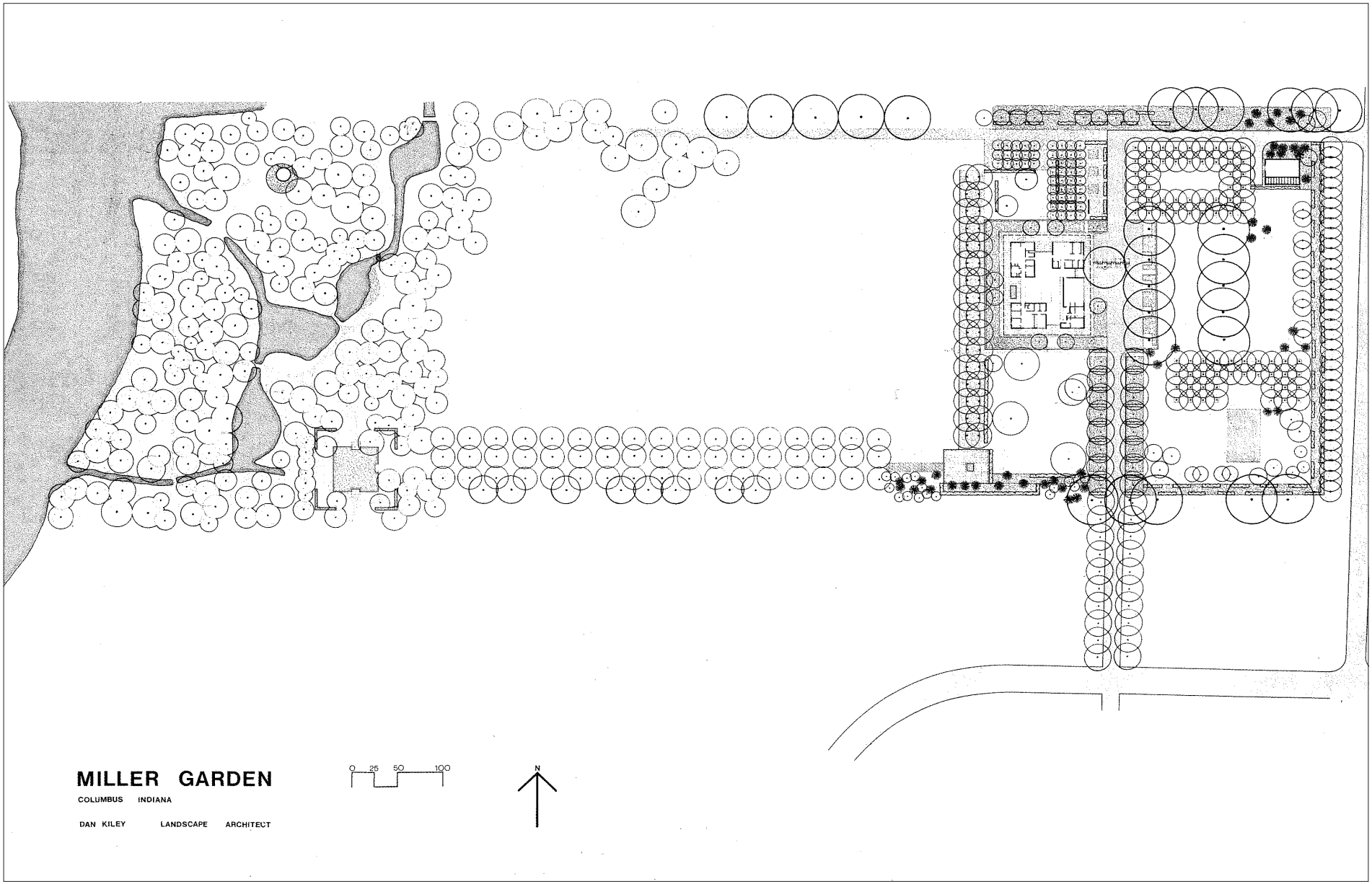


Fig. 3.6 Kiley's final published plan of Miller House and Garden landscape. Date: 1957. Photo credit: Brooks 2011, endpapers; Miller House and Garden Collection (M003), Newfields Archives.

Kiley's kit of parts included allées, rectilinear bosques, ground-cover checkerboards, and staggered hedges; planar surfaces (lawns, gravel, pavement, hedges) added a third dimension of spatial definition; a few specimen trees, located on the margins of many garden "rooms," enhanced the rectilinearity of the overall logic by gently departing from it. The spatiality of each element is what Kiley used to give each part substance. These plantings are not lines, they have depth, thickness, presence. The plantings choreograph varied experiences of light across the day, and different experiences of color across the seasons, tuned to the times when the Millers would be in residence.

The overall landscape plan had largely taken shape by late summer of 1955, and continued to be refined through 1958 Figure 3.6 is sometimes referred to as the "finished plan," but it is not an as-built drawing. And given the series of adjustments, replacements and refinements made over the ensuing decades, it is more accurate to think of this often-reproduced drawing as the "core plan."[78] Kiley referred to it as the "Master Landscape Plan" as he conveyed it to JIM in March 1957.[79] Over the next two years, the details of specific garden spaces and plantings were drawn, discussed with the Millers, and redrawn. Plants were sourced (finding plants of sufficient quality, size, and form was a continual struggle for those implementing the plans), planted and maintained. The Newfields Archives capture the flow of micro decisions about plantings, costs, contractors and other matters of design and construction—with Irwin Management staff bridging the designers and the Millers.[80] Over subsequent decades, plantings were frequently rethought or refreshed.

This widely published "core plan" represents the brilliance of Kiley's contribution to the grand collaboration convened by the Millers and to Modernism in landscape architecture. Kiley described the Miller Garden retrospectively as my "first truly modern landscape" and "a complete geometry on the land."[81] But the famous plan, and the canonical photographs by Stoller, Korab, and Alan Ward, also belies the core reality that the Miller House landscape has been in a continual stage of change for many decades and has never been "finished."[82] The change has been subtle for the most part, and unfailingly thoughtful and professional. Sometimes the change has been in response to external forces and sometimes simply to adjust the landscape to work best for its owners. But the changes have reinforced Kiley's core design logic and the refinement of the original design.

Construction of the landscape spaces began in 1955 but refinement and iteration of the design continued past the time the Millers moved in (1957). From the perspective of nearly 70 years after its conception and initial construction, a central theme of the Miller House landscape is that reconstruction, preservation, and adaptation have been continuous if uneven processes. Plants and plantings have been changed throughout the site, with some sort of adjustment or replacement happening almost annually. Changes were planned in consultation with Kiley's office at first (later by landscape architect Jack Curtis and, in 2008–2009, Michael Van Valkenburgh Associates (MVVA)).[83] The most prominent included: replacing Entry Drive horse chestnuts with yellow buckeyes; also in the Entry Drive, replacing arborvitae hedge with lower taxus hedges; replacing the two bosques of redbuds in the Adult Garden with crabapples; replacing the entire Honey Locust Allée in kind (twice); replacing individual or groups of apple trees and occasionally a whole orchards grid.[84] More frequently, dead and dying plants were replaced—few examples out of many include a beech replacing a magnolia in 1958; ivy in the ground beds bordering the terrazzo plinth, or the common occurrence of storm damage to trees.[85]

These planting changes have not altered the fundamental character of the Garden: the spatial logic creating particular experiences of nature and art, and relating site, landscape, house and interiors, was rigorously maintained. The core significance of MH&G has remained intact and indeed has been strengthened by the adaptations. Fundamentally, the logic of the Garden is rooted in space more than plants. In an interview with Bleam, Kiley stated: "'Most people are not excited about the dimensions of spaces. … [W]hen you pick trees and place them so many feet on center, this is very important, whether they're ten feet, twelve feet, fifteen feet, or eighteen feet on centers. Just like the windows in the Palazzo Farnese. Those things are what make it wonderful or not, the spatial proportion.'"[86]

The Millers changed the uses, function, and program of specific Garden spaces less frequently but with some substantial effects: adding the Swimming Pool; removing the Tennis Court from the East Lawn; adding the Greenhouse/Office; using the Honey Locust Allée plazas to display outdoor sculptures.[87] These changes, too, were accommodated within the overall logic of the landscape design. (There were also some unbuilt elements, proposed by Kiley but not accepted by the Millers—most strikingly, a woodland garden within the riverside forest, dismissed by the Millers in 1963.[88] A substantial addition was later made

to the site, the four-acre barn property, purchased in 1966.[89])

Because changes to the Miller Garden have in large part abided by the overall spatial and aesthetic logic of Kiley's plan, and mostly introduced plants of equal or greater ecological resilience/function, they are regarded as successful landscape conservation adaptations.

Not all critics have appreciated these subtle changes, nor accepted that the changes demonstrate evidence of the landscape's resilience rather than departures from an original design.[90] Kiley himself viewed at least some of the changes as less-than-desirable, regretting the removal of low ilex hedges in the Adult Garden, which "did a lot to spatially define the lawn and define the space."[91] As with many decisions about adjusting and maintaining the landscape—whether by Kiley's hand or others'—the more decisive point was the reinforcing spatial effect of the change, less the change in species planted.

Newfields Archives tell the story, through hundreds of documents, of continuous replantings, tree work, maintenance plans, addressing damage and die-offs caused by pests, poor stock, drainage problems, weather, and human error. Though the Archives don't present a complete record, a clear picture emerges of a carefully and expensively maintained landscape, evolving over decades, overseen by the Millers themselves and managed through an ongoing conversation between them, their Irwin Management staff, various designers (Kiley, Jack Curtis, MVVA), vendors and contractors.

Fig. 3.7 Photograph of North Orchard, Alan Ward. Date: 1986. Photo Credit: Hilderbrand, 1999, 46

Fig. 3.10 Honey Locust Allée, looking south. Date: 2021. Credit: PennPraxis/RM

Fig. 3.11 Terrazzo plinth with weeping beeches, west side of Miller House, looking north. Date: 2021. Credit: PennPraxis/RM

Fig. 3.13 East Lawn, looking north to apple orchard and Greenhouse in the distance. Date: 2021. Credit: PennPraxis/RM

Fig. 3.12 Grid of crabapple trees, Adult Garden, looking southwest. Date: 2021. Credit: PennPraxis/RM

Fig. 3.14 East Lawn, looking east, through oak allée to arborvitae boundary hedge. Date: 2021. Credit: PennPraxis/Rm

3.5 LIFE IN THE MILLER HOUSE

3.5.1 Family Life

On March 15, 1957, the move into the new house at 2760 Highland Way commenced, and it continued until April 6. Girard came to help with installation of furniture and objects on March 16, and Kiley visited April 5.[92]

XSM later recalled, "We'd lived in a standard, four-rooms-form-a-square, American house. Here we had more space."[93] It proved to be an ideal sized home for their family of seven: Will, the youngest, had been born only eleven months before, and the older children were aged six, nine, eleven, and thirteen. The design of the House was conducive to childhood fantasy—the kids hosted slumber parties in the Conversation Pit, roller-skated around the travertine patio, and played touch football on the Meadow every Thanksgiving.[94] Will Miller recalled playing under the foliage of the weeping willows, canoeing across the back lawn when it flooded, and playing in a kit log cabin that was assembled on the South Lawn once the Tennis Court was removed. Will Miller stated, "There was nothing too precious about [the house]. My fondest memory of the pit is doing backflips into it. It's the best place to have a pillow fight because the ammunition is always on hand."[95]

JIM often hosted out-of-town visitors for business or civic purposes, and one of the primary benefits of the House's open floor plan was its conduciveness to entertaining. The curtains that divided the Dining Room and the Den from the Living Room allowed the space to be more flexible when the Millers had guests. The Den curtain could be drawn to conceal the less formal part of the home, and after cocktails in the Conversation Pit, the motorized Dining Room curtain would be retracted to reveal a grand table scape. The only caveat to the layout during parties affected the children, who could not access the Kitchen from their bedrooms without traversing the Living Room.[96]

JIM made a point to leave the office every day at 5:30pm for dinner with his family.[97] Most family meals occurred at the Kitchen table, as the Dining Room required staff to serve and was largely reserved for special occasions. The Millers employed a cook, an average of three gardeners, and a driver/handyman.[98] Additionally, XSM had a personal assistant to help with the day-to-day operations of the home.[99]

JIM was a connoisseur of classical music, and regularly played Bach, Beethoven, and Handel on his 1715 Titian Stradivarius violin.[100] All of the children practiced piano on the Steinway; Will Miller described their lessons as "somewhere between encouraged and required."[101] Once the children reached high school age they attended boarding academies, so the home became quieter as the 1960s progressed.[102] One of XSM's most beloved hobbies was attending her bridge club—the self-described "Old Maids"—which consisted of a group of female friends who had known each other since high school. Bridge tables were set up in the Living Room or Den when it was XSM's turn to host.[103]

3.5.2 Special Guests

As prominent members of their community and active participants in civic, social, and philanthropic causes, the Millers were frequent entertainers at their home. In addition to multiple visits from Saarinen, Girard, Roche, Korab, and their friend Harry Weese, they also hosted renowned artists including Dale Chihuly and Jean Tinguely, who both created commissioned artworks for the City of Columbus that were funded by the Millers.[104] Their daughter Elizabeth's wedding reception was held on the property, as was the Irwin Management Company's 25th anniversary employee lawn party.[105]

The most famous visitor to the MH&G was First Lady Lady Bird Johnson, who stopped in Columbus during her four-day "Crossroads, USA" tour in September 1967. Press reports at the time indicated that the Johnson Administration was worried about the increasing population density of the nation's cities, as well as the President's unpopularity with midwestern farmers. The First Lady's tour was an attempt to highlight some bills related to rent supplements and farm programs that President Johnson wanted pushed through Congress, and to "show that small towns and cities west of the Appalachians can be rewarding places to live, even for the young."[106]

Hundreds of citizens flooded the streets for her visit, and tour buses arrived in the town to great fanfare. Twelve of Columbus's contributing design professionals—Alexander Girard, Gunnar Birkerts, John Carl Warnecke, Dan Kiley, Robert Venturi, I.M. Pei, Norman C. Fletcher, John Johansen, Romaldo Giurgola, John Dinkeloo, and Harry Weese—along with their wives and Aline Saarinen, were on board.[107] They were

Fig. 3.15 Miller family grouped in the living area. Date: 1961. Photo credit: Frank Scherschel for LIFE Magazine, © Time Inc.

Fig. 3.17 J. Irwin Miller leading a baseball game on the East Lawn of the Miller House and Garden. Date: c. 1960s. Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

Fig. 3.16 J. Irwin and Xenia Miller in their office. Date: 1961. Photo credit: Frank Scherschel for LIFE Magazine, © Time Inc.

Fig. 3.18 Will Miller and friends playing pin the tail on the donkey. Date: early 1960s. Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

Fig. 3.19 Irwin and Xenia Miller with their daughters, Elizabeth and Catherine. Date: ND (1967–1979). Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

Fig. 3.21 Members of the Miller Family Performing Music in the Living Room. Date: 1979. Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

Fig. 3.20 Miller family seated in the Dining Room for Christmas dinner. Date: 1976. Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

Fig. 3.22 Miller Family Kids' Table at Christmas. Date: c. 1995. Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

applauded by the other passengers as the buses passed the buildings they designed.[108] A plaque commemorating Johnson's visit was unveiled at Lincoln School, where she remarked, "This American city of Columbus has been called 'The Athens of the Prairie.' Ancient Athens, with its Acropolis, would have been proud and pleased to have you so designated."[109] A "Salute to Architects" dinner honoring the city's contributing designers was hosted at McDowell Elementary School and was attended by Johnson and 400 people.[110]

She toasted the architects, remarking, "It is said that architecture is frozen music, but seldom in history has any group of devoted artists produced such a symphony in stone as presents itself to the eye in Columbus."[111]

Johnson stayed in the Miller House Guest Room that evening—the *Indianapolis Star* reported, "red rosebuds in a pink vase were a bright spot in a serenely white bedroom where Lady Bird Johnson spent last night."[112] XSM remarked, "No, there won't be any satin sheets…we planned nothing special for when she arrived at our house. She must be terribly tired with her rigorous schedule."[113] Signing the guestbook before she departed, she called her time in Columbus "an unforgettable visit."[114]

Decades later, on June 14, 1994, French architect Christian de Portzamparc was awarded the Pritzker Architecture Prize at a ceremony at the Commons in Columbus, Indiana. It was attended by architects, critics, and the Pritzker jury, which included Frank Gehry, Ada Louise Huxtable, Cesar Pelli, and JIM. That evening, the Millers hosted an intimate celebration at their home in honor of Jay Pritzker, who established the namesake prize in 1979. After an elaborate dinner, JIM retrieved his Stradivarius and a small orchestra of Indiana University faculty musicians joined him for a short recital of Bach. Roche, who was in attendance that evening, later reflected, "I have always cherished that memory."[115]

3.6 ART AND OTHER ACQUISITIONS: CHANGES IN THE SITE, 1955-2008

During the design process, XSM had told Saarinen, "'I don't want to live in the same house all my life.'"[116] Saarinen responded, "'We've built you a neutral house, that can be changed.'"[117] As the Millers settled into their house, maintenance and modifications did occur. While this would be typical of any home, the manner in which issues were resolved resembled that of a corporate campus rather than a home. A review of documentation in the Newfields Archives indicates that work was typically initiated through staff at Irwin Management, developed by the three original designers while they were alive and then executed by Taylor Brothers and other local contractors.

Kevin Roche felt that the marble walls of the interior needed no embellishment. However, under Girard's influence the Millers already collected work by self-taught artists and, upon moving into the home, their interests soon shifted to paintings. In 1958 they purchased *The Old Oaken Bucket* by Anna Mary Robertson "Grandma" Moses, and by 1960 they had begun amassing what would become an impressive collection of 19th and 20th century art. JIM later confessed with characteristic modesty, "We didn't start out to have an art collection; we just bought pictures we liked and hunted around for a place for them."[118]

One of their first acquisitions was a watercolor by Wassily Kandinsky.[119] XSM later recalled:

> We didn't know where to hang it—it seemed to get lost. Eero came to visit; he was very concerned about what we did in his house. In the dining room there was a narrow space—we showed him where we had put it. He started puffing on his pipe—a sign he was nervous. Finally, Irwin said, "don't you like it?" "What is it?"—"A Kandinsky." "You know," he said, "it looks better already!"[120]

The collection ultimately included two Pablo Picassos and work by Henri Matisse, Marc Chagall, Claude Monet, Bonnard, and Mark Rothko.[121] In 1965, the Saarinen office provided drawings for new lighting and a wall-hanging system for two paintings and, in 1966, plexiglass and UV filters were added to the laylights.[122]

In 1958, Dan Kiley told the Millers and Kevin Roche:

> I am very pleased with the way the place is shaping up.... I do feel, however, that a Pavilion is very necessary at the North end of Locust Allée and hope that this will be considered soon. It will give the completion of form needed in this area, extend the house quality beyond the house boundaries and be a wonderful place from which to view outward to meadows and inward to garden.[123]

A series of renderings prepared by Kevin Roche John Dinkeloo Associates titled “Presentation photographs of proposed J. Irwin Miller office” and dated “1970?” show a glass pavilion located at the north end of the Allée (Figs. 3.24 and 3.25). The photos show models of several different sizes—one just a single module wide with large glass walls opening into the garden, and others three modules wide with walls almost entirely encircled by books (Fig. 3.26).[124] The Millers purchased Henry Moore’s *Draped Reclining Woman* in July 1971, and it became the focal point for the Allée rather than a structure.[125]

In 1966, a house, barn and 5.5 acres of land were purchased immediately south of the Miller House property.[126] This provided the site with full-time house and landscape staff in housing that was separate from the family’s space. In 1978, the wall that had separated the Maid’s Room from the Guest Room in the southeast quadrant of the house was removed to create a larger guest suite.[127]

The Greenhouse had become largely obsolete after the purchase of 2800 Riverside Drive. In 1973, it was converted into JIM’s home office and library based on designs by Girard. The girls’ bedrooms were renovated and the Children’s Playroom was adapted for an office for XSM around the same time.[128] After completing the Miller House, Girard had created new offices for JIM in existing buildings downtown, first as part of Cummins Headquarters in 1960, and then what became his primary office within Irwin Management in the former Irwin Bank Building in 1961. Girard renovated the Irwin Management offices in the early 1970s, about the same time that the home office was created.[129]

These projects were published in *Architectural Forum* and *Interiors*, and many design elements made their way into JIM’s home office.[130] In contrast to the bright colors of the Main Living Area in the House and the Cummins Headquarters, Girard said of the offices at 301 Washington Street, “‘It is all very severe, very quiet’”—a description equally applicable to the Greenhouse/Office suite.[131] Carpet used innovatively on the walls as well as the floors helped generate the sense of quiet, and furnishings and light fixtures were custom-designed by Girard. Both spaces included fireplace hearths made of historic limestone blocks salvaged from the sidewalk at the historic Irwin Bank, a sentimental gesture from Girard to Miller.[132]

Fig. 3.23 Proposed Office for J. Irwin Miller: View from Allée. Date: c. 1970. Photo credit: MHG_II_B040_F024_001-008, Miller House and Garden Collection (M003), Newfields Archives

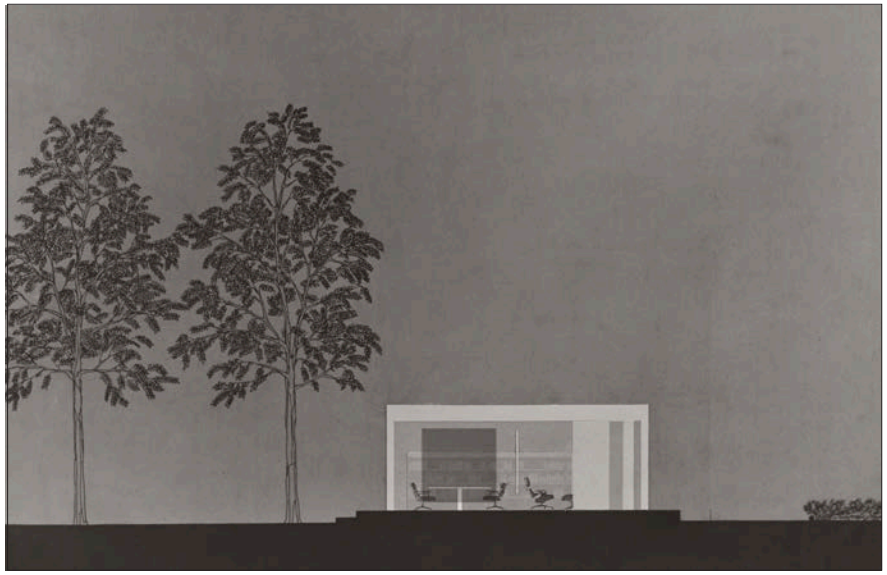


Fig. 3.24 Proposed Office for J. Irwin Miller: North-south Section view. Date: c. 1970. Photo credit: MHG_II_B040_F024_001-008, Miller House and Garden Collection (M003), Newfields Archives

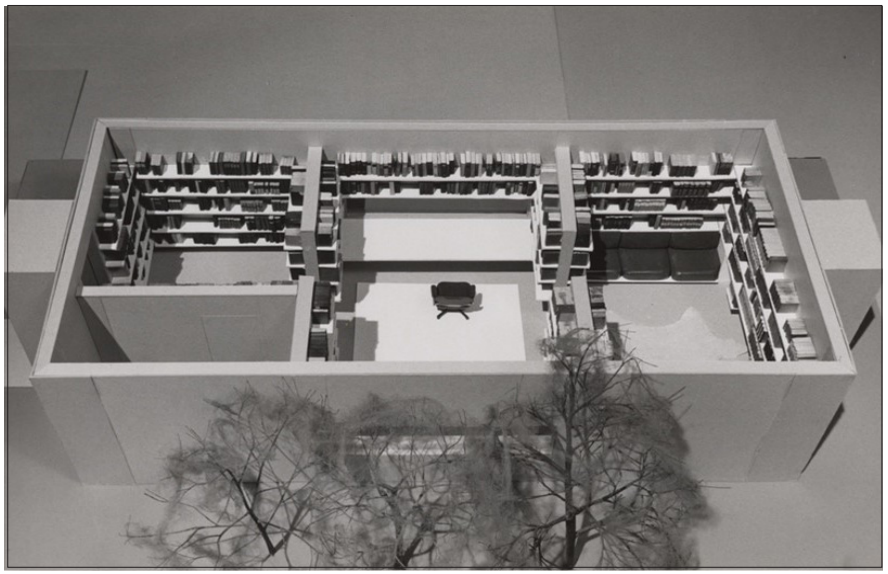


Fig. 3.25 Proposed Office for J. Irwin Miller: View of model option from above. Date: c. 1970. Photo credit: MHG_II_B040_F024_001-008, Miller House and Garden Collection (M003), Newfields Archives

Fig. 3.26 J. Irwin Miller Office in Greenhouse. Date: June 2021. Photo credit: Scattergood Design

Other modest changes were made inside the House through the years. In addition to providing a handrail for the Conversation Pit, "many years later, as Mr. Miller's, and then Mrs. Miller's, health began to fail, Roche helped to remodel the girls' bathroom so it could include a walk-in shower."[133]

3.7 A PRIVATE HOME MADE PUBLIC: THE PROCESS OF TRANSFER TO NEWFIELDS[134]

Negotiations

Even before JIM's death in 2004, the family had considered the future stewardship of the Miller House and Garden and the Irwin Home and Garden, JIM's childhood home.[135] In 2007, XSM's health was declining, and the National Trust for Historic Preservation and Historic Landmarks Indiana expressed interest in the Miller House and Garden.[136]

In the spring of that year, the Irwin-Sweeney-Miller Foundation organized a mini-charette in Columbus to discuss future roles of both properties in Columbus. The two-day-long meeting was facilitated by Tony Costello, the Irving Distinguished Professor of Architecture (Emeritus) at Ball State University. It was attended by staff from the Indianapolis Museum of Art (IMA) including Maxwell Anderson, Director and CEO; four of the five Miller children; faculty and staff from Ball State University, Yale University School of Architecture, and Harvard Graduate School of Design; and representatives from Landmark Illinois, the Cultural Landscape Foundation, Indiana Landmarks, the Columbus Area Visitor's Center, the Irwin-Sweeney-Miller Foundation, Lumina Foundation for Education, the Preservation League of New York State, the Heritage Fund of Bartholomew County, and the National Trust for Historic Preservation.[137]

Tours of both homes were provided, and the group discussed their potential future uses. The possibility of converting both properties into historic homes was considered, as was their capacity to function as sites of artist residencies, art galleries, or vacation rentals. The group also weighed the strengths and weaknesses of operating the properties as separate versus single entities, and discussed potential future partners, programming, and funding. After the meeting, Will Miller recalled speaking with Robert A.M. Stern, Dean of the Yale School of Architecture, who was also in attendance: "He said the Irwin home is nice but there are a lot of houses like it and most that become house museums do not survive. My parents' house was the

one that needed to be preserved. That was helpful input and others agreed with it, which led the Irwin home to be sold as a bed and breakfast."[138] Margaret, Catherine, Elizabeth, and Will Miller met separately later that month to discuss the feasibility of the future of both properties, agreeing that:

> impediments to beginning serious fundraising for the preservation of these homes at present are (a) lack of clarity on the program for their future use; (b) questions whether this will be viewed as the right memorial for JIM, assuming one wanted to honor him; (c) the possibility a more effective pitch will be organized around the significance of Saarinen and Kiley rather than JIM; and (d) an inability at present to say how much the family is going to commit to the project.[139]

On September 24, 2007, Maxwell Anderson, Bradley Brooks (Director of the Lilly House at the Indianapolis Museum of Art (IMA), and David Goodrich (IMA board member and Miller family friend) met with Will, Catherine, Elizabeth, and Margaret Miller, as well as Lynne Maguire (IMA board member, Chairwoman of the Irwin-Sweeney-Miller Foundation, and wife of Will Miller), Sarla Kalsi (President and CEO of Irwin Management Company), and Cheryl Buffo (Community Development Manager at Irwin Management Company).[140] Anderson expressed the IMA's interest in acquiring the property and converting it to a historic home, calling its preservation a "value proposition of world renown that would make the IMA unique."[141] Will Miller recalled, "I quickly saw some real benefits because, unlike most museums of its peer group, it already had a house museum and an extensive landscape and art garden. So it was uniquely positioned to handle the conservation of art, house, and landscape, which I had viewed originally as quite a puzzle so I was delighted when Max was interested."[142]

Initially, a shuttle bus between the IMA and the MH&G was suggested, although Anderson also noted the potential for cross-pollination between the IMA and the Columbus Area Visitor's Center.[143] A board task force was organized to determine the mission and feasibility of the acquisition, including how the property would be assessed, interpreted, conserved, and funded.[144] By the spring of 2008, the board was fully supportive of the acquisition; Anderson and the museum's development department were in the process of completing a $15 million fundraising plan for the home's endowment. A direct link to the Columbus Area Visitor's Center was agreed upon as the best option for transporting visitors to the property, and guided tours as the ideal mode of public access, with the option of smaller private events. The IMA at this point also had plans to produce a major exhibition or publication about the MH&G.[145] By that fall, the fundraising goals were reduced to $10 million, undoubtedly due to the onset of the global financial crisis.

Acquisition

On November 19, 2008, the IMA issued a press release announcing its intention to acquire the MH&G.[146] The Miller family and the Irwin-Sweeney-Miller Foundation agreed to donate the property and $5 million toward a planned $8 million endowment to cover its operations. In addition to raising the remaining $3 million for the endowment, the IMA planned to raise $2 million for the renovation of the MH&G, which the museum estimated would take eighteen months.[147] Ultimately, the IMA was unsuccessful in raising additional funds, but it did receive a grant from the Cummins Foundation to fund capital improvements and personnel costs related to preparing the house for public tours.[148]

The furnishings inside the home were not part of the original gift, nor was the Miller's fine art collection, which was auctioned at Christie's on June 24, 2008. The remainder of the House's contents were inventoried and appraised by Christie's in October 2008.[149] After they were divided amongst the heirs, Margaret, Catherine, Elizabeth, and Will donated over 5,000 of these objects to the museum, in addition to JIM and XSM's book and record collections. The Miller heirs auctioned additional objects from the home's collections through Bunte Auction Services on September 26, 2009, and the IMA purchased 579 items from the sale.[150] While several significant works remain with family members, overall the Miller House collection provides an excellent representation of how the House was furnished, the types of items the Millers collected, and how they were displayed.[151]

The IMA took ownership of the MH&G on May 1, 2009, two years to the day after the initial mini-charette was held. The following month, the museum applied for a Use Variance from Section 3.8(A) of the Zoning Ordinance for the property, and Anderson hosted a neighbor's reception at the home.[152] On July 28, 2009, the City of Columbus Board of Zoning Appeals held a public hearing at the City Council Chamber to consider this request. Several neighbors

were in attendance and expressed their concerns about the frequency and size of public tours, the scale of private events, and the use of the Highland Way entrance, which they predicted would be a major disruption. The board voted to continue the Use Variance to a future meeting and recommended that the IMA create an Operations Plan to address these concerns.[153]

Over the next several months, the museum drafted this plan with input from the neighbors, hosting them for open house tours that October and meeting individually with those whose homes were directly adjacent to the property. On October 27, 2009, the Use Variance was approved.[154] The Operations Plan indicated that no public parking would be available on the property and guests instead would be shuttled there for docent-led tours. No signage directing traffic to the property would be posted, and the Washington Street entrance would operate as the tour and service entrance. Both entrances would be closed via secured gates designed to complement the architecture of the home, and the IMA would work with owners of adjoining properties to install appropriate screening plantings.[155]

Interpretation and Research

After the acquisition of the home, IMA staff consulted the strategic plans of several other historic house museums, including Philip Johnson's Glass House, which had previously been donated to the National Trust and opened for visitors in May 2007. Many programming opportunities were considered in addition to tours, such as resident fellowships for foreign students; an annual seminar that would establish the IMA as a leader in design and historic preservation and the Miller House as a "think tank" much like the Getty Center; converting the Greenhouse/Office into a monthly conference retreat location for Indiana institutions to discuss civic, political, and social issues; and summer concerts on the back lawn presented in partnership with Indiana University.[156]

David De Long, Professor Emeritus of Architecture at the University of Pennsylvania, visited the home in November 2009 and provided recommendations for its restoration. He indicated that it would be a mistake to attempt to take the property to one specific time, as it was impossible to represent one single year. He instead suggested interpreting the home in a way that embraced the passage of time. For the landscape, he recommended retaining Kiley's concept of form, texture, and color, and that exact replacement of species was good, but perhaps less important.[157] Both of these recommendations were ultimately adopted by the museum. The following month, textile designer Jack Lenor Larsen visited the property. He was a longtime friend of Alexander Girard and Eero Saarinen, had consulted on the initial textile selections for the Conversation Pit, and he designed curtains for the home in the 1970s. In addition to identifying Girard's and his own designs, he also possessed an encyclopedic knowledge of world textiles and was able to provide the countries of origin for many of the other textiles used on pillows, curtains, decorations, and upholstery.[158]

In late 2009, Irwin Management Company donated the comprehensive records of design, construction, and maintenance of the MH&G to the IMA Archives. This provided a wealth of primary source material that aided in the research and interpretation of the home. In 2012, the IMA was awarded a $190,000 grant from the National Endowment for the Humanities to digitize a large portion of the Miller House and Garden Collection, making 17,699 images accessible and downloadable online.

These archives assisted in the process of documenting the furnishings and collections. A collections manager was hired to catalogue and label the House's contents, which were also photographed and formally accessioned. A site manager and dedicated security staff were also hired. After two years of intensive research and planning, IMA staff were able to develop materials for docent training. A volunteer docent program was established in partnership with the Columbus Area Visitor's Center, and the MH&G officially opened for public tours in May 2011. A book on the home—*Miller House and Garden*, written by Bradley Brooks—was published in August 2011.

Conservation and Repairs

When the IMA assumed ownership of the home, many repairs and alterations were required to transition the property from a private residence into an historic house museum. In 2010, areas of the terrazzo patio and Swimming Pool terrace were repaired and the Guest Bedroom was converted into an office for staff. The home's security system was upgraded, a new HVAC cooler was installed, and new carpet runners were purchased for floor protection. For protection against sun damage, UV filters were applied to all of the windows. In 2011, the Greenhouse/Office was fumigated to address black mold, and its roof and moldy carpet replaced. Damaged glass was re-

placed in the skylights, and repairs were conducted on the irrigation pressure tank, the south soffit, and the stone base for the Henry Moore sculpture.[159]

After the MH&G opened to the public, improvements to the House and its landscape continued. Storage mounts and boxes were created for many objects not on display in the home. New Den and Entryway rugs were woven based on Girard's original designs. The horse chestnut trees in the Entry Drive's allée were experiencing blight and early defoliation and were ultimately replaced with yellow buckeyes. The saucer magnolias at the north side of the house were replaced, as were the arborvitae hedges surrounding the pool and many of the apple trees in the Orchard.

Humidifiers were added inside the House for climate control, and all lighting was converted to LED. In 2020, the Swimming Pool was restored and activated for summer tours.

3.8 ENDNOTES

[1] Will Miller, quoted in Zeigler, "Prairie Modernist," 35.
[2] J. Irwin Miller to Alexander Girard, letter, May 25, 1953, MHG Ia B001 f002 142, Newfields Archives; J. Irwin Miller to Eero Saarinen, letter, May 25, 1953, MHG Ia B001 f002 144, Newfields Archives. In the letter to Girard, JIM mentions, "We have been negotiating for the past year and a half" for the property. The letter to Saarinen refers to the property as "the piece of ground that you and I tramped over last fall." Due to issues with the property boundaries, the purchase was not completed until September 8, 1953; see J. Irwin Miller to Mr. and Mrs. Clyde Marr, letter, September 8, 1953, MHG Ia B001 f002 131, Newfields Archives.
[3] Alexander Girard to J. Irwin Miller, letter, May 12 1953, MHG Ia B001 f002 143, Newfields Archives.
[4] J. Irwin Miller to George Newlin, letter, July 8, 1953, MHG Ia B001 f002 134-135, Newfields Archives.
[5] Zeigler, "Prairie Modernist," 27-28.
[6] Xenia S. Miller, quoted in Zeigler, "Prairie Modernist," 30.
[7] J. Irwin Miller to Will Mehlhorn, letter, December 11, 1958, MHG Ia B002 f010 011-012, Newfields Archives.
[8] Will Miller, "Eero and Irwin," 62.
[9] Will Miller, "Eero and Irwin," lecture, Ball State University College of Architecture and Planning, January 30, 2006, video recording, accessed April 1, 2022, https://www.youtube.com/watch?v=X-HbSj82prPQ.
[10] XSM in XSM and JIM, Webb interview.
[11] Xenia S. Miller, quoted in Zeigler, "Prairie Modernist," 56. On September 13, the datebook noted "Sandro for lunch"; See Xenia S. Miller, quoted in Zeigler, "Prairie Modernist," 56.
[12] Eero Saarinen, quoted in Aline Saarinen, ed., *Eero Saarinen on His Work* (New Haven: Yale University Press, 1962), 8, quoted in Ken Tadashi Oshima, "The Modern House in the Postwar Period, Part 7: Classically Modern: J. Irwin and Xenia Miller House by Eero Saarinen, Columbus, Indiana, USA 1953-1957," *A & U: Architecture and Urbanism no. 5332* (May 1998): 123.
[13] Merkel, Eero Saarinen, 157. Xenia S. Miller confirmed: "'We never told Eero or Kevin what to do, but we always felt free to send then back to the drawing board if there was something we didn't like'"; see Xenia S. Miller, quoted in David Dillon, "A Place No One Knows," in Gary R. Hilderbrand, *The Miller Garden: Icon of Modernism*, Landmarks 09 (Washington, D.C.: Spacemaker Press, 1999), 16. Presumably from an interview with JIM and XSM, September 24, 1996, Columbus, Indiana.
[14] XSM in XSM and JIM, Webb interview.
[15] Dillon, "A Place No One Knows," 16. Presumably from an interview with JIM and XSM, September 24, 1996, Columbus, Indiana.
[16] XSM in XSM and JIM, Webb interview.
[17] XSM, quoted in Dillon, "A Place No One Knows," 16, Columbus, Indiana. Presumably from an interview with JIM and XSM, September 24, 1996, Columbus, Indiana.
[18] Dillon, "A Place No One Knows," 16. Presumably from an interview with JIM and XSM, September 24, 1996, Columbus, Indiana.
[19] J. Irwin Miller, interview by Dillon with JIM and XSM, September 24, 1996, Columbus, Indiana, quoted in Dillon, "A Place No One Knows," 16.
[20] XSM, quoted in Dillon, "A Place No One Knows," 16, Columbus, Indiana. Presumably from an interview with JIM and XSM, September 24, 1996, Columbus, Indiana.
[21] Kevin Roche to J. Irwin Miller, letter, December 16, 1953, MHG Ia B001 f002 126-130, Newfields Archives.
[22] Eero Saarinen to Alexander Girard, letter, March 10, 1954, MHG Ia B001 F002 118-121, Newfields Archives.
[23] J. Irwin Miller to Alexander Girard, letter, March 19, 1954, MHG Ia B001 f002 097-103, Newfields Archives.
[24] J. Irwin Miller to Alexander Girard, letter, March 19, 1954, MHG Ia B001 f002 097-103, Newfields Archives.
[25] Kevin Roche to J. Irwin Miller, letter, December 16, 1953, MHG Ia B001 f002 126-130, Newfields Archives; Eero Saarinen to Alexander Girard, letter, March 10, 1954, MHG Ia B001 F002 118-121, Newfields Archives. $200,000 would be an equivalent of close to $2.153 in April 2022; see "$200,000 in 1953 to 2022, Inflation Calculator," Official Inflation Data, Alioth Finance, April 22, 2022, https://www.officialdata.org/us/inflation/1953?amount=200000.
[26] J. Irwin Miller to Alexander Girard, letter, March 19, 1954, MHG Ia B001 f002 097-103, Newfields Archives.
[27] Eero Saarinen, "Saarinen," *Perspecta 7* (1961): 29.
[28] "Columbus, Indiana: The Town that Architecture Made Famous," *Architectural Forum 123*, no. 5 (December 1965): 41.
[29] Kevin Roche to J. Irwin Miller, letter, December 16, 1953, MHG Ia B001 f002 126-130, Newfields Archives.
[30] Roche to JIM, letter, December 16, 1953.
[31] Nancy Kriplen, *J. Irwin Miller: The Shaping of an American Town* (Bloomington, IN: Indiana University Press, 2019), 35.
[32] Eero Saarinen in "'The Changing Philosophy of Architecture,'" *Architectural Record 116*, no. 2 (August 1954): 182.
[33] Eero Saarinen, "The Six Broad Currents of Modern Architecture," *Architectural Forum 99*, no. 1 (July 1953): 112. Eliel Saarinen's 1948 book, The Search for Form in Art and Architecture, describes ordering systems among many cultures; presumably his son absorbed these through his training at Cranbrook; see *Eliel Saarinen, The Search for Form in Art and Architecture* (1948; repr., New York: Dover Publications, 1985).
[34] Christopher Monkhouse, "The Miller House: A Private Residence in The Public Realm," in *Eero Saarinen: Shaping the Future*, ed. Eeva-Liisa Pelkonen and Donald Albrecht (New Haven: Yale University Press, 2006), 238.
[35] Kiley and Amidon, *Dan Kiley: The Complete Works*, 21.
[36] "New Concept of Beauty," *House and Garden*, 60.
[37] J. Irwin Miller to Alexander Girard, letter, July 23, 1954, MHG Ia B001 f002 087-089, Newfields Archives.
[38] Kevin Roche to J. Irwin Miller, letter, February 18, 1955, MHG Ib B008 f070 001, Newfields Archives. On January 27, Miller had written to Joseph Lacy at Saarinen's office: "Confirming our telephone conversation, we agreed that one general contract will be satisfactory; we agreed to invite Simmons and Winters of Indianapolis to bid and Dain of Anderson, provided my bank check-up shows him to be responsible. I will talk with Dunlaps, Taylors, and Repp & Mundt in Columbus to determine whether they are anxious to bid and will ask only those are genuinely interested in the job"; see J. Irwin Miller to Joseph Lacy, letter, January 27, 1955, MHG Ia B001 f002 047, Newfields Archives.
[39] Joseph N. Lacy to J. Irwin Miller, letter, January 24, 1955, MHG Ia B001 f002 048-049, Newfields Archives; The "two local contractors" are unnamed in the correspondence, but presumably one was Taylor Brothers.
[40] Joseph N. Lacy to J. Irwin Miller, letter, January 24, 1955, MHG Ia B001 f002 048-049, Newfields Archives. Wermuth had also worked at Cranbrook, and Saarinen and Saarinen designed a home for the contractor in Fort Wayne, Indiana constructed in 1941-1942. See Pelkonen and Albrecht, *Shaping the Future*, 140.

[41] Thomas C. Dorste to Joseph N. Lacy, letter, January 20, 1955, MHG Ia B001 f002 050, Newfields Archives. Thomas Charles Dorste (1923-2002) had graduated from MIT in 1947. He was in practice with Spiros G. Pantazi in Indianapolis at the time the Miller House was built. The firm was credited with designing a number of houses in the area. In 1959, he practiced under his own name, and was responsible for the Indianapolis Convention Center (1972). The connection with Saarinen or Miller is not known. Pierre and Wright were associate architects for the First Christian Church project. See *Prabook – World Biographical Encyclopedia*, "Thomas Charles Dorste," accessed on April 22, 2022, https://prabook.com/web/thomas_charles.dorste/606202; and Thayer, Joyner, and Cairns, "First Christian Church," 9.
[42] Thomas C. Dorste to Joseph N. Lacy, letter, January 20, 1955, MHG Ia B001 f002 050, Newfields Archives.
[43] Thomas C. Dorste to Joseph N. Lacy, letter, January 20, 1955, MHG Ia B001 f002 050, Newfields Archives. Dorste listed three additional firms located in Anderson and Zionsville, Indiana for consideration.
[44] Joseph N. Lacy to J. Irwin Miller, letter, January 24, 1955, MHG Ia B001 f002 048-49, Newfields Archives.
[45] J. Irwin Miller to Taylor Brothers Construction Company, letter, April 18, 1955, MHG Ia B001 f002 035, Newfields Archives. The files do not include more information on the bidding or selection process. $352,000 would be an equivalent of close to $3.776 million in April 2022; see "$352,000 in 1955 to 2022, Inflation Calculator," Official Inflation Data, Alioth Finance, April 23, 2022, https://www.officialdata.org/us/inflation/1955?amount=352000.
[46] "Taylor-Made Construction," newspaper advertisement, *The Republic* (Columbus, IN), March 5, 1963, https://www.newspapers.com/image/138752898/.
[47] "Taylor-Made Construction," newspaper advertisement, *The Republic* (Columbus, IN), March 5, 1963, https://www.newspapers.com/image/138752898/.
[48] Taylor-Made Construction," newspaper advertisement, *The Republic* (Columbus, IN), March 5, 1963, https://www.newspapers.com/image/138752898/.
[49] "About Taylor Bros.," Taylor Bros, Construction Co., Inc., accessed April 23, 2022, http://www.tbcci.com/about.
[51] "George William Newlin," Find a Grave, accessed April 23, 2022, https://www.findagrave.com/memorial/89244581/george-willia.; "George Newlin, former Irwin Management president, dies," *The Republic* (Columbus, IN), January 19, 2005, https://www.newspapers.com/image/147894986/?terms=Newlin%2C%20George&match=1.
[52] George Newlin to Thomas Dorste, letter, July 21, 1955, MHG Ia B001 f002 001, Newfields Archives.
[53] J. Irwin Miller to Alexander Girard, letter, September 12, 1955, MHG Ia B001 f001 070, Newfields Archives.
[54] J. Irwin Miller to George W. Newlin, letter, July 6, 1956, MHG Ia B001 f005 049, Newfields Archives.
[55] L.D. Hoffman to J. Irwin Miller, memorandum, drawings, photos, August 24, 1956, MHG Ia B001 f003 016-22, Newfields Archives.
[56] Virgil Taylor to B. L. Slate, letter, September 23, 1955, MHG Ia B001 f001 047, Newfields Archives. Joseph Lacy from Saarinen's office wrote to Glide on September 29, 1955: "We have specified Glide Windows on two projects currently under construction. One of these is a multi-million dollar college project in Ft. Wayne, Indiana, being built by Wermuth, Inc., the other is a large residence in Columbus, Indiana." Lacy advised that both contractors were complaining that Glide was not responding to letters and noted: "It hardly seems necessary for me to point out the effect this has on our attitude toward your company"; see Joseph Lacy to B.L. Slate, letter, September 29, 1955, MHG Ia B001 f001 048, Newfields Archives.
[57] P.J. Every to J. Irwin Miller, letter, November 4, 1955, MHG Ia B001 f001 042, Newfields Archives.
[58] "The colors on the same door do or do not match. They have dark spots and streaks. The welds are bad"; see Larry D. Hoffman to J. Irwin Miller, letter, September 7, 1956, MHG Ia B001 f004 120-121, Newfields Archives.
[59] J. Irwin Miller to Xenia S. Miller, memorandum, October 4, 1956, MHG Ia B001 f004 101-102, Newfields Archives.
[60] Kevin Roche to J. Irwin Miller, letter, October 4, 1956, MHG Ia B001 f004 071-075, Newfields Archives.
[61] Eero Saarinen and Associates and Alexander Girard, Specifications: Miller Residence, February 15, 1955, MHG_Ib_B008 F070, 8.1, Newfields Archives.
[62] George Newlin to J. Irwin Miller, memorandum, December 4, 1956, MHG Ia B001 f004 012-014, Newfields Archives.
[63] Larry D. Hoffman to J. Irwin Miller, memorandum, September 7, 1956, MHG Ia B001 f004 120-121, Newfields Archives.
[64] The memo implies that the concrete slab was to be exposed, as Devening said "he would charge more [for making the slabs] than marble would cost." In addition to cracking, he was concerned that the exterior slabs would bleach and erode; see Larry D. Hoffman to J. Irwin Miller, memorandum, September 7, 1956, MHG Ia B001 f004 120-121, Newfields Archives.
[65] George Newlin to J. Irwin Miller, correspondence, report, July 13, 1956, MHG Ia B001 f005 044-046, Newfields Archives.
[66] Joseph N. Lacy to J. Irwin Miller, letter, June 6, 1955, Newfields Archives.
[67] J. Irwin Miller, quoted in Beverly Russell, "America Discovers Columbus," *House and Garden* 148, no. 7, July 1976, 83.
[68] J. Irwin Miller to Will Mehlhorn, letter, December 11, 1958, MHG Ia B002 f010 011-012, Newfields Archives.
[69] Dan Kiley to J. Irwin Miller, letter, June 18, 1955, MHG Ia B001 f002 014, Newfields Archives.
[70] Hilderbrand, The Miller Garden, 16. No source given. It is not clear where the "ranch house" referenced here was located, if it actually existed.
[71] Hilderbrand, *The Miller Garden*, 18.
[72] Gregg Bleam, "Dan Kiley: Planting the Grid," in *Preserving Modern Landscape Architecture II: Making Postwar Landscapes Visible* (Washington, D.C.: Spacemaker Press, 2006), 73.
[73] Kiley and Amidon, *Dan Kiley: The Complete Works*, 20-27.
[74] Dan Kiley and Jane Amidon, *Dan Kiley: The Complete Works of America's Master Landscape Architect*, 1st U.S. ed. (Boston: Little, Brown, and Company, 1999), 23.
[75] Hilderbrand, *The Miller Garden,* 29.
[76] J. Irwin Miller, quoted in Hilderbrand, *The Miller Garden,* 16.
[77] Bleam, "Planting the Grid," 73.
[78] Dan Kiley and Jane Amidon, *Dan Kiley: The Complete Works of America's Master Landscape Architect*, 1st U.S. ed. (Boston: Little, Brown, and Company, 1999), 20; Hilderbrand, The Miller Garden, 36; for Bradley C. Brooks, *Miller House and Garden* (New York, NY: Assouline Publishing, 2011), end papers; Dan Kiley, Miller Garden Drawing, MHG IIIb FF056 001, Newfields Archives.
[79] Dan Kiley to J. Irwin Miller, letter, Newfields Archives, MHG Ia B002 f009 061, Newfields Archives.
[80] Exchanges of correspondence and drawings were intense between 1956 and 1958 during initial design, but extended into the 1970s and 80s with replacement and adaptation projects such as the Entry Drive.

[81] Dan Kiley, quoted in Hilderbrand, *The Miller Garden*, 19.
[82] As David Dillon stated, "Every contemporary landscape architect has read about it, heard about it, seen photographs of it. Yet few have actually set foot in it"; see Dillon, "A Place No One Knows," 12.
[83] Refer to timeline, Section 3.9.
[84] Refer to Section 7 for details.
[85] Michael Brown to George Newlin, April 15, 1958, MHG Ia B002 f011 011, Miller House and Garden Collection, Newfields Archive; Irwin Management Co., memorandum, August 4, 1969, MHG Ib B023 F248 090, Newfields Archives.
[86] Bleam, "Planting the Grid," 70
[87] Refer to timeline, below in this section.
[88] Douglas Sampson to Xenia S. Miller, letter, January 24, 1963, MHG Ib B022 F240 026, Newfields Archives.
[89] Newfields had been unable to provide documentation on the purchase of the site before completion of the CMP.
[90] Dillon, "A Place No One Knows," 12, calls Miller House "a refined period piece," suggesting it is frozen in time.
[91] Bleam, "Planting the Grid," 74.
[92] XSM daybook entries, quoted in Zeigler, "Prairie Modernist," 74.
[93] XSM in XSM and JIM, Webb interview.
[94] Amy Wimmer Schwarb, "Modern Family: The Miller Home," *Indianapolis Monthly,* May 2011, https://www.indianapolismonthly.com/arts-and-culture/modern-family-the-miller-home; Will Miller, Zoom interview with Shelley Selim, December 10, 2021.
[95] Will Miller, Zoom interview with Shelley Selim, December 10, 2021.
[96] Schwarb, "Modern Family."
[97] Steven V. Roberts, "Is It Too Late for a Man of Honesty, High Purpose and Intelligence to Be Elected President of the United States in 1968?" *Esquire*, October 1, 1967, https://classic.esquire.com/article/1967/10/1/is-it-too-late-for-a-man-of-honesty-high-purpose-and-intelligence-to-be-elected-president-of-the-uni.
[98] Bradley Brooks, "Miller House and Garden Frequently Asked Questions," August 1, 2014, Miller House Guide Training files, Indianapolis Museum of Art at Newfields. The cook also served as the housekeeper.
[99] Bradley Brooks, "Miller House and Garden Frequently Asked Questions," August 1, 2014, Miller House Guide Training files, Indianapolis Museum of Art at Newfields.
[100] Nancy Kriplen, *J. Irwin Miller: The Shaping of an American Town* (Bloomington, IN: Indiana University Press, 2019), 131.
[101] Will Miller, quoted in Schwarb, "Modern Family."
[102] Will Miller, Zoom interview with Shelley Selim, December 10, 2021. All of the children went to boarding school for grades 9 to 12, except for Will, who attended boarding school from grades 10 to 12.
[103] Schwarb, "Modern Family."
[104] Zeigler, "Prairie Modernist," 79.
[105] Dave Goodrich, phone interview with Shelley Selim, February 11, 2022.
[106] "First Lady On Tour in Crossroads America," *New York Times*, September 24, 1967, https://timesmachine.nytimes.com/timesmachine/1967/09/24/105264596.html?pageNumber=204.
[107] Ben Cole, "Columbus Greets Touring Lady Bird," *Indianapolis Star*, September 22, 1967, 17,
[108] Kriplen, *J. Irwin Miller*, 4.
[109] Ben Cole, "Columbus Greets Touring Lady Bird," *Indianapolis Star*, September 22, 1967, 17.
[110] Ben Cole, "Columbus Greets Touring Lady Bird," *Indianapolis Star*, September 22, 1967, 17
[111] Gerry LaFollette, "Lady Bird Toasts Columbus as 'Stone Symphony,'" *Indianapolis News*, September 22, 1967, 1, newspapers.com.
[112] Naomi Campbell, "Lady Bird A Bit Late; Supper Has to Wait," *Indianapolis Star,* September 22, 1967, 11, Proquest Historical Newspapers.
[113] Naomi Campbell, "Lady Bird A Bit Late; Supper Has to Wait," *Indianapolis Star*, September 22, 1967, 11, Proquest Historical Newspapers.
[114] Guest Book, Miller Home, 1957 – 2001, BV4297, Xenia Simons Miller Papers, Irwin-Sweeney-Miller Family Collection, Indiana Historical Society Archives, Indianapolis, IN
[115] Kriplen, *J. Irwin Miller*, 11.
[116] Xenia S. Miller, quoted in Hamilton, "Design Notebook."
[117] Eero Saarinen, quoted in Hamilton, "Design Notebook."
[118] Michael Webb, "Interview with Mr. and Mrs. J. Irwin Miller, 2760 Highland Way, Columbus, Indiana" (June 13, 2000), p. 4.
[119] Ohne Titel by Wassily Kandinsky was purchased by the Millers in August 1960. Christie's, Property from the Estate, 26.
[120] XSM in XSM and JIM, Webb interview. Ohne Titel by Wassily Kandinsky was purchased by the Millers in August 1960; see Christie's, Property from the Estate, 26.
[121] See the biographical section on XSM and Section 3.8 which follows for more information on the Millers' collection and its disposition.
[122] MHG_IIIc_FF 067-001 through -006, Newfields Archives.
[123] DK to Millers, Maschmeyer, Roche, June 4, 1958, Newfields Archives.
[124] Presentation photographs of proposed J. Irwin Miller office dated "1970?" MHG_II_B040_F024_001-008.
[125] Christie's, *Property from the Estate*, 66.
[126] Xenia Miller related, "We built a lean-to greenhouse and implement-and-tool house along the service drive on the west side of the arborvitae hedge, then converted it to an office for Mr. Miller in 1960 when we purchased a barn next to serve this purpose." See Xenia Miller, "Grounds at 2760," typewritten mss., Newfields Archives.
[127] "Guest Suite Revisions," drawing dated May 20, 1974, Kevin Roche John Dinkeloo & Assoc., Newfields Archives.
[128] Schwarb, "Modern Family."
[129] Ben Wever, conversation with Pamela Hawkes, June 3, 2021.
[130] Ben Wever, conversation with Pamela Hawkes, June 3, 2021.
[131] Alexander Girard, quoted in "And now—carpeted ceilings," *Interiors* (February 1975),
[132] Ben Wever, conversation with Pamela Hawkes, June 3, 2021. Extensive archival materials related to the downtown office interiors, including fabric samples, is available at Columbus Indiana Architectural Archives, BCPL Archives, Bartholomew County Public Library, Columbus, https://bcplarchives.omeka.net/search?query=irwin+management+offices&query_type=keyword&record_types%5B%5D=Item&record_types%5B%5D=File&record_types%5B%5D=Collection&submit_search=Search\.
[133] Schwarb, "Modern Family."
[134] Much of the information in this section was found in Newfields' curatorial and registration departmental files and provided by the museum.
[135] Will Miller, Zoom interview with Shelley Selim, December 10, 2021.
[136] Hugh Th. Miller v. William Irwin Miller and Sarla Kalsi, 03A01-0912-CV-586 (Court of Appeals of Indiana, September 30, 2010), https://caselaw.findlaw.com/in-court-of-appeals/1540092.html.
[137] The mini-charette was held on April 30 and May 1, 2007. The full roster of attendees

included: Maxwell Anderson, Director and CEO, Indianapolis Museum of Art; David Bahlman, Executive Director, Landmark Illinois; Joseph Biello, Dean and Professor of Architecture, Ball State University; Charles Birnbaum, Founder, the Cultural Landscapes Foundation; Bradley Brooks, Director of the Lilly House, Indianapolis Museum of Art; Malcolm Cairns, Professor and Chair of the Department of Landscape Architecture, Ball State University; Mary Daniels, Librarian, Harvard Design School's Special Collections Department; Marsh Davis, President, Indiana Landmarks (then called the Historic Landmarks Foundation of Indiana); Lynn Lucas, Executive Director, Columbus Area Visitors Center; Lynn Maguire, Chairman, Irwin-Sweeney-Miller Foundation; Catherine Miller, family member; Elizabeth Miller, family member; Margaret Miller, family member; Will Miller, family member; John Mutz, Chairman, Lumina Foundation for Education; William Shopsin, Founder, Preservation League of New York State; Sherry Stark, President, Heritage Fund of Bartholomew County; Robert Stern, Dean, Yale University School of Architecture; Michael Van Valkenburgh, Charles Eliot Professor in Practice of Landscape Architecture, Harvard Graduate School of Design; Jim Vaughan, VP, Stewardship of Historic Homes, National Trust for Historic Preservation; Bret Waller, Director Emeritus of the Indianapolis Museum of Art; Mark Zelonis, Horticulture Division Director of the Indianapolis Museum of Art. Curatorial files of R. Craig Miller, Indianapolis Museum of Art at Newfields.

[138] Will Miller, Zoom interview with Shelley Selim, December 10, 2021.

[139] Will Miller to Sarla Kalsi and Cheryl Buffo, email, May 31, 2007, , MHG Ib B027 f303 030 031, Newfields Archives.

[140] Memorandum, September 24, 2007, Curatorial files of R. Craig Miller, Indianapolis Museum of Art at Newfields.

[141] Memorandum, September 24, 2007, Curatorial files of R. Craig Miller, Indianapolis Museum of Art at Newfields.

[142] Will Miller, Zoom interview with Shelley Selim, December 10, 2021.

[143] Memorandum, September 24, 2007, Curatorial files of R. Craig Miller, Indianapolis Museum of Art at Newfields.

[144] Memorandum from Maxwell Anderson to Miller House and Garden Board Task Force, November 1, 2007, Curatorial files of R. Craig Miller, Indianapolis Museum of Art at Newfields.

[145] Notes from IMA/MHG status meeting, April 22, 2008, Curatorial files of R. Craig Miller, Indianapolis Museum of Art at Newfields.

[146] "IMA Announces Intention to Acquire Miller House and Garden," *Art Daily,* November 19, 2009, accessed April 24, 2022, https://artdaily.cc/news/27323/IMA-Announces-Intention-to-Acquire-Miller-House-and-Garden.

[147] "IMA Announces Intention," *Art Daily.* The property was put into a trust in 2007, naming Xenia Miller as beneficiary. Upon her death, Hugh Miller was bought out of his share of the trust and Margaret, Catherine, Elizabeth, and Will Miller donated the home to the IMA; see Hugh Th. Miller v. William Irwin Miller and Sarla Kalsi, 03A01-0912-CV-586 (Court of Appeals of Indiana, September 30, 2010), https://caselaw.findlaw.com/in-court-of-appeals/1540092.html.

[148] Christine Baldwin to Shelley Selim, email, February 16, 2022; Jennifer Soline to Shelley Selim, email, February 16, 2022.

[149] Christie's, Miller House Furniture and Decorative Objects Inventory, October 17, 2008, curatorial files of Bradley Brooks, Indianapolis Museum of Art at Newfields.

[150] Most of the items purchased by the IMA were Easter decorations, animal figurines, dinnerware, and flatware.

[151] Some significant items are presumed to remain with the family. These include but are not limited to: a small collection of ancient Greco-Roman and Etruscan terracotta pottery; a living room rug designed by Kevin Roche; several dozen ceramic figures by Giancarlo "Tunsi" Girard; a large collection of American and English silver; XSM's butterfly and glass perfume bottle collections; and items pictured in the storage wall in the February 1959 issue of House and Garden including a Chinese birdcage and ceramic frog, an Indian elephant, religious figures, a Mexican candelabra, an Austrian inlaid cabinet, an English inlaid marble box, a wood and bone parquetry "Italian Tower," and a pair of Hopi prayer sticks.. Some items visible in early photographs of the home were not present for the 2008 inventory and their whereabouts are unknown. This includes a Saarinen "Womb" chair with custom white base, which was mentioned in correspondence and invoices and was shown in several photographs of the home taken in the late 1950s and early 1960s.

[152] Application for Use Variance from Section 3.8(A), June 19, 2009, Curatorial files of Bradley Brooks, Indianapolis Museum of Art at Newfields. IMA Memo from Dave Hunt to Max Anderson, Jack Leicht, Bradley Brooks, Mark Zelonis, Katie Zarich, July 29, 2009, Curatorial files of Bradley Brooks, Indianapolis Museum of Art at Newfields.

[153] IMA Memo from Dave Hunt to Max Anderson, Jack Leicht, Bradley Brooks, Mark Zelonis, Katie Zarich, July 29, 2009, Curatorial files of Bradley Brooks, Indianapolis Museum of Art at Newfields.

[154] Board of Zoning Appeals Conditions of Approval for a Variance or Conditional Use, City of Columbus Indiana, November 5, 2009, Curatorial files of Bradley Brooks, Indianapolis Museum of Art at Newfields.

[155] Miller House and Gardens Operations Plan, October 27, 2009, Curatorial files of Bradley Brooks, Indianapolis Museum of Art at Newfields. The Operations Plan also outlines additional restrictions related to private events, maximum number of visitors, and tour hours.

[156] R. Craig Miller, Mission for the Miller House, March 18 2009, Curatorial files of R. Craig Miller, Indianapolis Museum of Art at Newfields.

[157] Bradley Brooks and R. Craig Miller, Notes: David De Long meeting with Craig Miller, Mark Zelonis, and B. Brooks, 19 Nov. 2009, Curatorial files of R. Craig Miller, Indianapolis Museum of Art at Newfields.

[158] Notes on Jack Lenor Larsen Miller House Visit, December 17, 2009, Curatorial files of R. Craig Miller, Indianapolis Museum of Art at Newfields. An interview with Larsen and R. Craig Miller was also filmed at the Miller House during this visit.

[159] Meeting notes, Curatorial files of Bradley Brooks, Indianapolis Museum of Art at Newfields.

3.9 TIMELINE

The following timeline builds on one generated by the Newfields Archives. Sources for information are typically included in Sections 2 and 3.

Date	Building	Contents & Collections	Landscape
1942	Eliel and Eero Saarinen design the First Christian Church in Columbus, Indiana.		
1950	Eero Saarninen's Irwin Union Bank & Trust is completed in Columbus, Indiana.		
1952	Llanrwst, the Millers' summer home in Muskoka, Ontario completed to the designs of Eero Saarinen and Alexander Girard.		
Jun 1953	The Millers acquire the property.		
Jul 1953			JIM authorizes a topographic survey of the site.
Dec 1953		Girard develops initial module calculations for the interior.	
Mar 1954	JIM and XSM approve the one-story concept for the House.		
Sep 1954		Girard sends the first Furnishings Index.	
Oct 1954	Roche sends revised blueprints to the Millers.		
Feb 1955	Specifications are mailed and bids are solicited from contractors.		
Apr 1955	Construction contract awarded to Taylor Brothers Construction.		
Jun 1955			JIM meets with Kiley for the first time, sharing client requests and initial design ideas.
Aug 1955		Girard's first purchase is made for the House—a Bessarabian rug for the Living Room	
Sep 1955	JIM notes that the House construction has not surpassed the foundation.		Kiley submits the first planting plan for the landscape.
Jan 1956		Girard sends a new version of the Furnishings Index.	Arborvitae is planted and grading plan is complete for the area west of the House.
Feb 1956	House is completely closed in, skylight glazing is underway and floor is prepped for terrazzo.		Entrance landscaping is complete.

Date	Building	Contents & Collections	Landscape
July 1956	Plastering is underway.		Landscape structural and lighting plans are complete. Two magnolia trees on the north side of the house are planted in the wrong location, and another is dying.
Aug 1956			Kiley proposes additional plantings.
Mar—Apr 1957	The family moves into the house.		
Jun 1957			The exterior lighting plan is updated.
Jul 1957	The New York Times contacts JIM to write about the House.		
Nov 1957			Revised planting plan specifies the plants for the Honey Locust Allée, Adult Garden, Apple Orchards, Greenhouse, entrance, and South Garden.
Dec 1957			Plan for the Adult Garden is refined.
Feb 1958—May 1958			Plantings are refined, in anticipation of Ezra Stoller's upcoming photo shoot.
Apr 1958	Ezra Stoller photographs the House for *Architectural Forum*'s September issue.		
Jun—Aug 1958			Various plantings continue to be introduced or improved.
1958			Greenhouse constructed.
Feb 1959	MH&G featured in *House and Garden*.		
May 1960			Swimming Pool and Bathhouse drawings are issued.
Aug 1960		Ohne Titel by Wassily Kandinsky purchased, among the first of the Millers' significant art collection.	
Aug 1962			Saarinen designs a new fence.
1963			Swimming Pool is added.
May 1963			Kiley sends a sketch (from 1961) for a pergola.
1966			Purchase of 2800 Riverside Drive.
Sep 1967	First Lady Lady Bird Johnson stays in the Guest Room while visiting Columbus.		

Date	Building	Contents & Collections	Landscape
1968	Lighting revisions in Living Room and Dining Room. Plexiglass added to the skylights to protext interior artwork from sun damages.		
Early 1970s			Tennis Court removed.
1971			Henry Moore sculpture is installed on the North Plaza of the Honey Locust Allée.
1972			Entry Drive and Service Drive are repaved with cement pavers.
1972-1973	Greenhouse is converted to office for JIM. Girls' bedrooms are renovated and Playroom is converted into an office for XSM.		
1973			The baffle arborvitae hedge in the Entry Drive's allée is replaced with a taxus hedge.
1974	Outlets are added to the back of the storage wall, and some electricity is rewired.		
1974	New built-in cabinetry is added to the west wall of the Kitchen.		
1974	The skylight ballasts are replaced.		
1978	The Guest Bedroom and Maid's Room are remodeled to become a Guest Suite.		
Jun 1979			Kiley suggests a hemlock hedge for the inside of the arborvitae hedge, and a new wrought-iron fence.
Oct 1980			Kiley sends advice for replacement trees on the North Lawn.
1981			The arborvitae along the driveway is replaced with yews.
1984	The Master Bedroom bookcase is remodeled.		The yellowwood tree on the North Lawn is replaced with Bradford pear trees.

Date	Building	Contents & Collections	Landscape
1986			The redbuds in the Adult Garden are replaced with crabapple trees; ilex hedges framing the redbuds are removed. The Honey Locust Allée is replanted; ground limestone in the Allée is replaced with granite. Directed by landscape architect Jack Curtis.
1994	A handrail is added to the Conversation Pit.	The Conversation Pit cushions are replaced.	
Jun 1994	Pritzker Prize Jury dinner at the home		
Sep 1996			A new access stair and ladder is added to the Swimming Pool.
1998	New TV and new face for entertainment wall. Generator Purchase		Limestone base added for Henry Moore sculpture.
1999	Security system upgraded. New Master Bathroom countertop.		
2000	Master Bathroom tub converted to shower.		
2001	New HVAC system installed. Grab bars added in Master Bathroom bath.		
2002	The roof is replaced. Girls' Bathroom tub converted into shower. Boy's Bathroom grab bars added.		
Aug 16, 2004	Death of J. Irwin Miller.		
April–May 2007	Charette convened by Irwin-Sweeney-Miller Foundation to discuss future role of Miller properties.		
Feb 19, 2008	Death of Xenia Miller.		
Jun - Dec 2008		The art collection is removed from the site and sold at various auctions.	
2009			The Miller family replants the Honey Locust Allée shortly before the Indianapolis Museum of Art (IMA) assumes ownership.

Date	Building	Contents & Collections	Landscape
May 2009	The IMA assumes ownership of the Miller House and Garden.		
Sep 2009	Remainder of House contents divided among heirs. Selected objects donated by Margaret, Catherine, Elizabeth, and Will Miller to the Museum. Additional objects sold through Bunte Auction Services and some purchased by the Museum.		
Late 2009	Irwin Management Company donates records of design, construction, and maintenance of the Miller House and Garden to IMA Archives.		
2010	UV filters are applied to all windows.		
2010	Guest Bedroom converted to staff office.		
2010	Sections of the outdoor terrazzo are repaired and replaced.		
May 2011	The Miller House and Garden opens for public tours.		
2011	Greenhouse fumigated to address black mold and original carpet replaced. Greenhouse roof is also replaced.		
2012	Grant from the National Endowment for the Humanities to digitize Miller House and Garden Collection.		
2013			Horse chestnuts in Entry Drive allée experiencing blight and early defoliation. Replaced with yellow buckeyes.
2013—2014		New Den and Entryway rugs are woven.	
2014			Saucer magnolias at the north side of the House replaced with larger specimens.
2015			Saucer magnolias at the south side of the House replaced.
2016	The IMA adds new humidifiers for climate control.		
2017	30-year Master Plan for IMA campus is completed.		
2018	All lighting in the house is converted to LED.		
2019	Getty Foundation awards Keeping It Modern Grant to create a Conservation Management Plan.		
2020			Swimming pool restored.

Date	Building	Contents & Collections	Landscape
2020			126 Arborvitae replanted around pool
2021			North Apple Orchard replanted with 'Red Jewel' Crabapple (Malus x). Total trees 42.
2022			South Apple Orchard replanted with 'Red Jewel' Crabapple (Malus x). Total trees 34
2022			Strong storm with straight line winds damages many plantings, complete losses of: magnolia at car port, 8 crab apples from adult garden, 15 arborvitae along north property line, 3 Ginkgo trees along north property line

4
Management Context: Ownership, Regulations, and Stakeholders

4 MANAGEMENT CONTEXT: OWNERSHIP, REGULATIONS AND STAKEHOLDERS

Sections 2 and 3 establish the contexts of designing and constructing the Miller House and Garden (MH&G), including the stories of those directly involved in its creation. This short section outlines some additional contexts of MH&G, beyond the accounts of the site's creation but important to enabling and guiding its ongoing management. These additional contexts make note of the ownership arrangements, current uses, regulatory environment, stakeholder relationships, and the institutional context of Newfields' Historic Preservation Policy. Each of these subjects are included in the Conservation Management Plan (CMP) for their potential to shape and support future decisions.

4.1 OWNERSHIP

The first and most important fact of management context for the CMP is MH&G's ownership by Newfields. As detailed in Section 3.8, the property was donated by the Miller family to IMA in 2009, following a diligent process of study and discernment. MH&G opened for public visits in 2011.[1] This arrangement determines the professional, high-quality, curated management and use of the property—in keeping with the high standard of care long maintained by the Millers and their management team. The Miller family undertook a careful process of discernment over the options for the future of the property following the deaths of J. Irwin Miller and Xenia S. Miller. They consciously decided to continue this style of management in conveying the property to Newfields (then the Indianapolis Museum of Art [IMA]) as an historic site that would be open to the public.

Newfields has been a model owner in many ways. Conservation of MH&G benefits from a strong alignment with Newfields' cultural-landscape-focused mission: MH&G is a great place to reinforce the stewardship of both cultural and natural resources toward creating great "experiences with art and nature."[2] MH&G is a singular statement of designing around this very mission, though for a home-turned-house museum, like Oldfields-Lilly House & Gardens. Oldfields is a country estate founded in 1907 and has been managed by Newfields since 1967 with NHL designation since 2003. The MH&G is valued by Newfields as part of its collections, and strong curatorial ties relate the House, collections, and gardens to the design collection and to Newfields' main campus which includes other highly complex and significant domestic landscapes (Oldfields). Conservation and management of MH&G proceeds from the high standards of curatorial care practiced at the Museum, in relation to all its collections: art, other houses, other landscapes. The continuous engagement of Ben Wever as on-site Site Manager is another hallmark of Newfields' consistent attention to and investment in a high level of management of MH&G.

MH&G, though, is 50-miles-distant from Newfields' home in Indianapolis, and has sometimes and in some ways been regarded as an outlier of Newfields' collections and operations. Previous Newfields' leaders have questioned whether MH&G should remain under the museum's ownership as part of the collection; current Newfields' leadership has demonstrated its steadfast commitment to stewardship of MH&G and its high regard for the site's cultural significance. As a key element of Columbus' heritage as a home of Modernist design, MH&G remains meaningful to the region (even nationally and internationally) as part of its legacy of great art, design and culture.[3]

As the transition from private home to museum property was negotiated around the transfer to the IMA, measures were put in place to sustain the public benefit purposes of the property in the event that the museum should "relinquish ownership." The Miller House and Garden Operating Plan, revised December 8, 2015, notes that:

> Should the museum relinquish ownership of the Miller House and Garden, the agreement transferring the property to the IMA requires that the museum consult with the Irwin-Sweeney-Miller Foundation in selecting another tax-exempt public charity to which to transfer the property. If none can be found, the agreement states that the property will be transferred to the Heritage Fund—The Community Foundation of Bartholomew County or, if it is no longer in existence, to a similar charity located in Bartholomew County, Indiana.[4]

IMA transitioned to Newfields in 2017, encompassing the management of the IMA, Oldfields-Lilly House & Gardens, Virginia B. Fairbanks Art & Nature Park, other elements of the Indianapolis campus, and the MH&G under one brand extending across Indianapolis and southern Indiana.[5]

4.2 ONGOING MANAGEMENT

This section notes a few particular themes that characterize the foundations of how MH&G has been managed over time, up to Newfields' ongoing management as a continuation of the Millers' legacy.

Leadership, Design Intent and Integrity. Changes made to the House, its furnishings and the landscape after completion were relatively minor and thus its integrity and significance is very high. Nonetheless, as outlined in the previous chapters, alterations did occur, whether replacement of trees which failed to thrive or drapery fabrics which faded. As noted in the Newfields' Historic Preservation Policy, "The house and garden underwent few changes, all of which involved consultation from their respective designer or the designer's representative, keeping in mind the original design intent."[6]

Consultation with design professionals Alexander Girard, Dan Kiley, and Kevin Roche was a critical starting point for all changes to furnishings, landscape or architectural elements proposed at the House during the Millers' lifetime. Most major changes or significant repair and replacement projects, such as terrazzo or roofing, were undertaken under the direction of Taylor Brothers, the original contractors. They maintained relationships with the subcontractors who had installed various materials and systems and thus had detailed knowledge of their as-built conditions and intended operations. This practice also ensured consistency and respect for the original craftsmanship.

Stewardship, Maintenance and Record-keeping. The general approach to design and construction of the site was more typical of a corporate headquarters, and so was its maintenance, with dedicated, knowledgeable staff who completed tasks on regular schedules. Activities such as cleaning skylights and raking paths were executed with a close attention to detail. According to current Site Manager Ben Wever, who was employed by the Millers in several capacities:

> The property was maintained to a very high level because you wanted the Millers to be able to go anywhere and enjoy their garden. If you were pollarding apple trees, and you went to lunch, you would put the ladders and rakes away and you stuck them between the arborvitae… The terrace was where they would take lunch and enjoy looking out onto the landscape, so that meant that the English ivy near the terrace always needed to be cut back with a straight edge on both sides and leveled out on top.[7]

JIM and XSM always experienced the site in optimum conditions. They spent summers at Llanrwst in Canada and winter months in their Kevin Roche-designed home in Hobe Sound, Florida, so more disruptive activities like painting or roof replacement would be scheduled during their absence.

The Millers' management company handled disbursements and supervision of house operations at the Miller House and other family properties. It is not clear where those records currently reside.

Irwin Management handled larger projects—execution, administration, and payment—through their "Client Services" division.[8] Correspondence was saved, organized, and ultimately transferred to the IMA by the Miller family with the property in 2009. From 2012–2015, the materials were digitized through a grant from the National Endowment for the Humanities and made available online.[9] These materials provide a remarkable context for documenting not only changes but also the cycle of maintenance and deterioration for its materials and systems. Archives staff have provided summaries of correspondence related to some key items, such as the terrazzo. Other key materials were reviewed by the CMP team, but much remains to be gleaned from analyzing this valuable resource.

Resources. As the home of the Cummins Engine Company (CEO) and a site for corporate entertaining, the cost of repairs and maintenance at the MH&G appear to have been closely watched, but generously funded. The annual operating budget was about $450,000 in the late 1990s, not including staff.10 The $5 million endowment given to the IMA in 2008 by the Irwin-Sweeney-Miller Foundation with the MH&G

was based on the understanding that a five percent draw would cover the typical annual budget for repairs and maintenance.[11]

Maintenance Personnel & Practices. Day-to-day maintenance at the site was carried out by a full-time staff of five. As with the contractors, their expertise and long familiarity with the site and the Millers' standards of care were noteworthy. Staff included:

- Housekeeper and Maintenance Man, a married couple who lived on site at 2500 Riverside.
- Three full-time Grounds staff, including one Head Gardener.
- One seasonal Grounds staff member.

Typical activities and maintenance practices have not been documented. Valuable information could be obtained through oral histories with staff who worked at the site during the Millers' lifetime.

Public Programs and Use. The public activities at MH&G consist almost entirely of guided tours organized with the Columbus Area Visitors Center (CAVC). The CAVC partnership is original to the 2008 conversion from house to historic site and is reinforced by the Use Variance/Operating Plan (which does not specify a role for CAVC but requires visitor parking and transport from outside MH&G). The experience of ticketed visitors begins and ends at CAVC; the tours themselves are guided by volunteers who receive training from Newfields' staff (Site Manager Ben Wever). The tour begins at the downtown Visitor Center at 506 Fifth Street, where visitors park their vehicles and board a small (15-passenger-maximum) bus for the short ride to MH&G. Using the Washington Street entrance, the bus drops passengers in the Service Drive; the walking tour progresses through the House and several garden spaces.

Numbers of visitors are limited by the size of bus and calendar/schedule of tours. In 2021, about 12,000 visitors participated.[12] The past few years of COVID-related travel restrictions affected tour availability and numbers significantly.[13]

In additional to CAVC-led tours, Newfields convenes occasional small meetings and events at MH&G. There is no regular program for these rental events; parking and access for very small numbers of visiting vehicles is accommodated in the small parking area west of the Barn at 2800 Riverside Drive.

4.3 PUBLIC REGULATIONS

MH&G is, of course, subject to the whole panoply of laws and regulations promulgated by local, county and state jurisdictions. The few regulations directly related to management of the historic site are mentioned here; these regulatory contexts might come into play if substantial changes were contemplated to the current status or operations of the site (none such are known or contemplated in this plan).

The development and neighborhood context of MH&G—historically a single-family house in a neighborhood of single-family houses—occasioned the negotiations described in Section 3.8 to allow a publicly visited nonprofit museum in what is otherwise a residential district. The Bartholomew County/City of Columbus zoning district for MH&G (2760 Highland Way and 2800 Riverside Drive) is mapped as "RS1 Residential: Single Family 1." This is a typical, least-dense, single-family residential district. Primary permitted uses include single-family dwelling and nature preserve/conservation area; conditional uses include "community garden"; "museum" is not permitted this requiring the Use Variance.[14] Through the municipal review and regulation mechanisms, Newfields, city authorities and adjacent landowners reached an accommodation of the outlier use in the form of a Use Variance. The agreement ("Operating Plan") negotiated through this process is quite detailed as to the types, size, number, conditions, and impacts of functions (events) allowed to be held at MH&G. The clear limits established in this agreement are designed to minimize the impact of museum-hosted events and public tours on the surrounding residential area.[15]

There are no local historic preservation, historic district or historic overlay policies in place for Bartholomew County/City of Columbus.[16] The only preservation policies applicable are Federal regulations connected to MH&G's National Historic Landmark (NHL) status. These

create few regulatory constraints, protections, or financial incentives unless proposed actions use Federal funds or licenses (which we think unlikely, but would result in a Section 106 process under the National Historic Preservation Act).[17]

The CMP does not include a detailed study of local land use, building, and environmental regulations. However, an analysis of floodplain data and regulations is included in Section 9. Approximately half of the MH&G property is mapped in the Federal Emergency Management Agency (FEMA) Floodplain zones for "Zone AE Floodway" or "Zone AE 100-year," signaling the likelihood of flood events repeating in the future.

4.4 NEWFIELDS HISTORIC PRESERVATION POLICY

Newfields' Historic Preservation Policy (HPP), dated 2017, articulates the institution's policies and decision guidance relating to all historic properties owned by the museum. MH&G is among the handful of distinct properties, most of which comprise the main campus in Indianapolis.

The text of the 2017 HPP is included in the Appendices. Without summarizing it comprehensively, this section describes the structure and intent of Newfields' HPP while noting points most germane to MH&G's CMP. (In Section 10 some suggestions are made for revising the HPP and bringing it in line with this CMP).

I. PHILOSOPHY AND MISSION STATEMENT: This section declares the importance of historic property stewardship to Newfields—reflected in care of Oldfields-Lilly House and Gardens, Westerley (sold in 2021), and Miller House and Garden. The policy commits to high standards of stewardship and professional practice in carrying out these self-declared obligations (reinforced by NHL designations). The structure of the policy is described, based on an articulation of significance and character-defining elements for each major historic property and its major constituent elements (including MH&G).

II. GOVERNING AUTHORITY: The section states Newfields' Board of Governors' role in making decisions, and the role of several committees to review decisions about preservation, other design projects, changes in use, and resource allocations. It states the intention of reviewing the HPP's guidelines every five years.

III. STATEMENT OF SIGNIFICANCE: This section contains overall narrative statements of significance for each of the major properties (MH&G, Oldfields), as well as bullet lists of character-defining elements and very brief assessments of integrity for a number of sub-elements of the site (the House, Greenhouse, and six distinct landscape spaces).

IV. GUIDELINES AND STRATEGIES (DECISION-MAKING CRITERIA): This section references the Secretary of the Interior's Guidelines for the Treatment of Historic Properties and Guidelines for the Treatment of Cultural Landscapes, and applies this document's approach of framing all preservation activity in terms of four levels of material intervention: preservation, rehabilitation, restoration and reconstruction. The HPP then assigns one level of intervention for an entire property as the overall preservation policy—for MH&G it is "preservation." This is far too gross an approach to policy, especially for a site of such high-quality design, history of extremely careful maintenance, and surpassing level of cultural significance. The CMP endorses reference to these standards, however the CMP adopts a much finer level of detailed analysis and decision-making, and also employs a somewhat different philosophical approach (basing decisions on individual elements' tolerance-for-change rather than prescribing material treatments). See Section 10 for elaboration.

V. MAINTENANCE, CARE, AND DOCUMENTATION: This final, short section of the HPP is critical, committing Newfields to a strong culture of stewardship as it implements this and related policies.

In conclusion, the CMP strongly endorses continuous updating of the Newfields HPP as it sets and reinforces the institutional context for the CMP and its implementation. The MH&G CMP should effectively be incorporated into Newfields' HPP. Updating the policy in 2022 is strongly advised.

4.5 STAKEHOLDERS

Stakeholder engagement is prompted by the conditions, needs, and issues of a site and its management organization. In other words, the clarity and stability of current and future stewardship arrangements dictate that partnership building is secondary—additional or reconsidered partnerships present opportunities for enhancement and exploration in the future, but are not a precondition for devising and implementing the CMP. Stakeholders and partnerships are discussed in this section as a context for the CMP; policy suggestions in this area are presented in a separate memo accompanying the CMP.

For several reasons, stakeholder analysis is less critical for the MH&G CMP:

- The strict focus of the CMP on conservation of design elements and experiences, as opposed to interpretation, marketing, or creating management alternatives;
- Clear and unambiguous ownership (which the CMP assumes will not change);
- Correspondingly less reliance on partnerships for basic operations, maintenance, and planning—the CAVC relationship for delivering tours stands out;
- Stable and settled relationships with statutory agencies and adjacent neighbors;
- Substantial changes in overall management model/operations are not being contemplated;
- Attracting more visitors is not a management imperative presently or in the foreseeable future; indeed, the limited carrying capacity of site is an ongoing concern such that the CMP does not assume an increase in visitation.

Given the clear, stable ownership arrangements of MH&G, its ongoing treatment as a museum-held historic site, and the particular brief of the CMP, this present project has not focused intensively on external stakeholders and partnerships. The team's overall assessment is that things have been working well in terms of stakeholder engagement and partnerships. The few, productive relationships have served stewardship of MH&G well. Yet, more than 12 years have passed since the transfer, adaptation, and opening of the site. The CMP's role is not exploring new or changed partnerships through its conversations with stakeholders. Rather, this plan aims to draw some suggestive lines on the map of potential stakeholders, pointing out possible directions for exploring new partnerships.

Owing to the nature of the current, abiding management model, the CMP did relatively few interviews to directly inform the conservation issues. Newfields strong, clear, effective institutional management model, drawing on the extensive professional staff of the larger organization supplemented by a devoted site manager, deprioritizes partnerships as a concern in sustainable site management. By contract, more interviews, with a broader range of actual and potential stakeholders, would be called for to inform a plan exploring management alternatives, expanded partnerships, or community-facing programs (driven, for example, by need for revenue generation).

Management of MH&G relies extensively on Newfields' own efforts, resources, and staff. This stemmed from the 2009 transfer and remains appropriate. A handful of tacit partnerships with neighbors underpin the current management regime (memorialized in the 2009 Use Variance agreement). One active partnership on organizing public tours with Columbus Area Visitors Center, where tours of MH&G begin and end.

The CMP team interviewed a handful of individuals, some connected directly to the property and its management, others representing Columbus-based organizations. A few broad themes related to conservation planning emerged:

- MH&G holds a prominent position in Columbus—it is a core asset contributing to civic identity, even though it is regarded as a more "private" place.
- Newfields' role as steward is respected and renowned, and Ben Wever's contributions are an important part of this.
- Greater appreciation was gained of the change and adaptability of MH&G itself— in other words, its attraction and value goes beyond the original "perfection" of its design.
- There is unrealized demand for broader community-facing partnerships. Stakeholder conversations indicated a clear de-

sire among other Columbus-based institutions for more partnerships with MH&G. “The door is open” to ideas about future programming, events, co-sponsoring, even some limited partnering with professional or educational organizations on site-centered activities like conditions monitoring, site recording, or conducting oral histories.

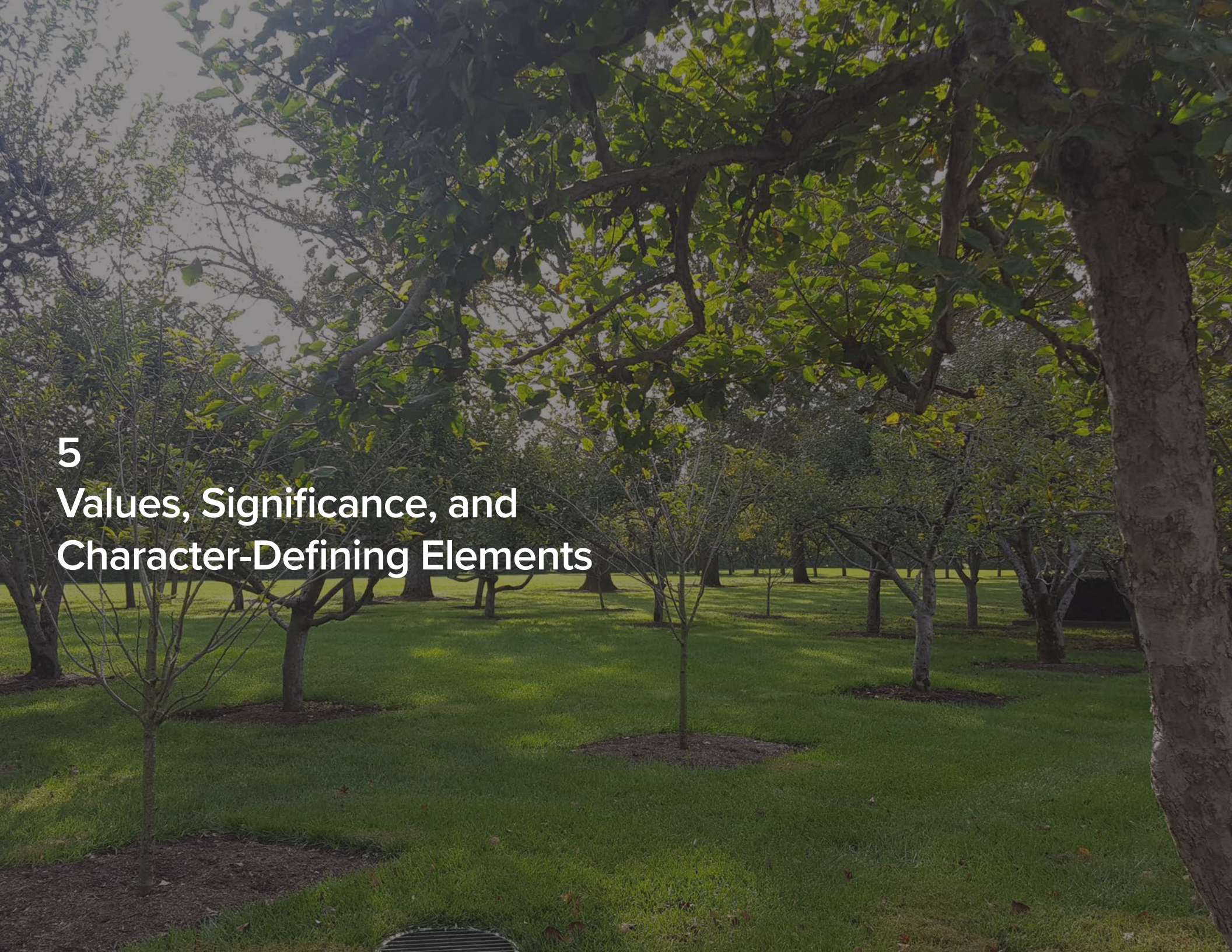
- Beyond topics directly related to conservation (in other words, beyond the scope of a CMP) Newfields would be well-advised to explore in more depth existing and potential stakeholder and partner relationships—to expand the possibilities for future programming and other partnerships even within the strictures of current ownership.
- There is strong potential for future development/fund-raising conversations with funders directly connected to Columbus and Indiana, and on a national scale. Having the completed CMP in hand and contemplating some additional external partnerships beyond current practice (with higher-education institutions, for instance) would present strong premises for support requests.
- Rekindling conversations with neighbors: it seems most appropriate for Newfields to reopen those conversations directly, continuing long-standing relationships to brief them on the content of the CMP; re-examine the Tour Agreement for neighbors’ perspectives on its success over the 10+ years since its approval.

As partnership opportunities are contemplated in the future, the current context suggests several kinds of possibility. They are presented here not in terms of priority regarding conservation goals, rather in terms of several nested “circles” of stakeholders with support, information, resources, or connections that could contribute directly to Newfields’ ongoing stewardship. Those stakeholders include:

- Newfields staff
- Miller family: key informants and the most deeply rooted and committed stakeholders
- Adjacent property owners: continuing conversations with them will support conservation and management in practical ways (keeping them informed of Newfields’ plans and projects, dealing with boundary plantings) and strategic ways (engaging them in discussions about potential changes to the Use Variance agreement, if needed)
- Local institutions: Columbus-based educational, arts or heritage organizations; locally rooted foundations and corporations
- Regional institutions: county historical society, universities
- Other, more distant historic-site institutions (for cross-learning, special exhibitions, and potentially marketing)
- National and international devotees of Modernism and the preservation of Modernist design.

4.6 ENDNOTES

[1] "History," Newfields, accessed April 29, 2022, https://discovernewfields.org/about/history; Alice Buhl, "Irwin Sweeney Miller Foundation: A Study in Spend Down," National Center for Family Philanthropy, November 2013, https://www.ncfp.org/wp-content/uploads/2018/09/A-Study-in-Spend-Down-The-Irwin-Sweeney-Miller-Foundation-NCFP-2013-the-irwin-sweeney-miller-foundation-a-study-in-spend-down.pdf.
[2] "Mission," Governance and Administration, Newfields, accessed April 29, 2022, https://discovernewfields.org/about/governance-administration.
[3] The draw of MH&G for national and international visitors would be a worthwhile audience or marketing study.
[4] Miller House and Garden Operating Plan, revised December 8, 2015, 5, Newfields.
[5] "History," Newfields.
[6] Newfields, Historic Preservation Policy, September 18, 2017, 5, Newfields.
[7] Mark R. Eischeid, "Every Branch and Blade," *Landscape Architecture Magazine*, July 2019, https://landscapearchitecturemagazine.org/2019/07/11/every-branch-blade/.
[8] This and other information related to past and current maintenance practices at the Miller House were provided in a telephone interview with Ben Wever, November 19, 2021, and in other conversations in person.
[9] The Finding Aid to the Miller House and Garden Collection is located at: https://discovernewfields.org/application/files/3715/0829/3385/archives-M003.pdf.
[10] This and other information related to past and current maintenance practices at the Miller House were provided in a telephone interview with Ben Wever, November 19, 2021, and in other conversations in person.
[11] Buhl, "A Study in Spend Down."
[12] Columbus Area Visitors Center, 2021 Annual Report, 6.
[13] The CMP does not address revenue sharing, but these arrangements should be factored into future management studies.
[14] "Columbus Zoning & Subdivision Regulations," Columbus Indiana Bartholomew County Planning, accessed on April 29, 2022, https://www.columbus.in.gov/planning/zoning-subdivision-regulations/.
[15] Miller House and Garden Tour Agreement. "Exhibit B—Miller House and Garden Plan (October 27, 2009) as designated by the Board of Zoning Appeals."
[16] Based on review of County and City government websites and plans; also see Richard McCoy, "The Columbus Challenge," Objects Specialty Group Postprints 21 (2014): 363-377, http://29aqcgc1xnh17fykn459grmc-wpengine.netdna-ssl.com/osg-postprints/wp-content/uploads/sites/8/2015/03/osg021-17.pdf.
[17] https://www.nps.gov/subjects/nationalhistoriclandmarks/faqs.htm



5
Values, Significance, and Character-Defining Elements

5 VALUES, SIGNIFICANCE, AND CHARACTER-DEFINING ELEMENTS

5.1 INTRODUCTION

Assessments of value, significance, and character-defining elements (CDEs) form the core logic of conservation management plan decision-making. This section reports on three cumulative analyses that contribute to this logic, explaining why the Miller House and Garden (MH&G) is valued (by varied stakeholders, in varied ways, for varied reasons), what aspects of the place call for conservation, and how values and significance are reflected in the fabric and experiences of the place.

Because these three terms are used in particular ways in values-based conservation planning, some succinct definitions are in order:

- Values are the qualities of the place that that distinguish the site as a heritage place and prompt its conservation; they are teased apart and assessed explicitly as a first step;
- The values are synthesized, contextualized, and prioritized in a statement of significance (SoS); the SoS is a touchstone of preservation policy, an index on how changes (intended or unintended) relate to the foundational reasons that the site is regarded as a heritage place;
- Significance is related to the physical resources, patterns and experiences of the site—these expressions of significance in the physical and experiential realities of the site are termed character-defining elements; preserving CDEs is the principal means of ensuring the integrity of the site—the capacity of the place to convey significance.[1]

The subject of the Conservation Management Plan's (CMP) assessment of values and significance is the original 10-acre rectangular site purchased by the Millers and designed by Saarinen, Girard, and Kiley and their teams. However, in studying the existing conditions of the place, and proposing conservation and management measures later in the report, the 14-acre site under management is defined as the entire property owned by Newfields (the space of the original design project, 2760 Highland Way; plus the barn/field parcel to the south, 2800 Riverside Drive).

The values and significance of MH&Ghave long been recognized, so the analysis starts by looking at past assessments—in particular, the National Historic Landmark (NHL) listing of MH&G completed in 2000—then reconsidering how values of the site may have evolved or expanded to the current moment.[2] Periodically reassessing the significance of heritage sites is an important principle in values-based conservation planning, acknowledging that the understanding of places changes through time—as do the contexts against which values are assessed and the significance of a site is articulated.

Updating Existing Statements of Significance

It is beneficial to reconsider and update statements of significance done in the past—not simply accept the first version as the best version and the last word. Value-based conservation (VBC) practice calls for revisiting these statements periodically, as understanding of the place and its contexts evolves.[3]

The NHL-nomination Statement of Significance codifies the core cultural significance of the site as a standout work of architectural and landscape architectural design. The six-page text establishes an important foundation for this and future assessments of MH&G's significance. Given the evolution of scholarship, social contexts, and the evolution of the site, several refinements and additional points are suggested to strengthen the NHL's SoS:

- The NHL was based on National Register Criterion C (design/construction) and Exception G (less than 50 years, which is no longer relevant); NHL Criterion 4 (exceptionally valuable architecture) and Exception 8 (less than 50 years). In other words, its distinction was judged to rest largely in its architectural design.
- The site is listed as "Miller House," which may undervalue the Garden/landscape elements and the deeply important contributions of the design integration of architectural and landscape architectural elements; in the NHL text, however, both architecture and landscape architecture are acknowledged to be of "exceptional importance."

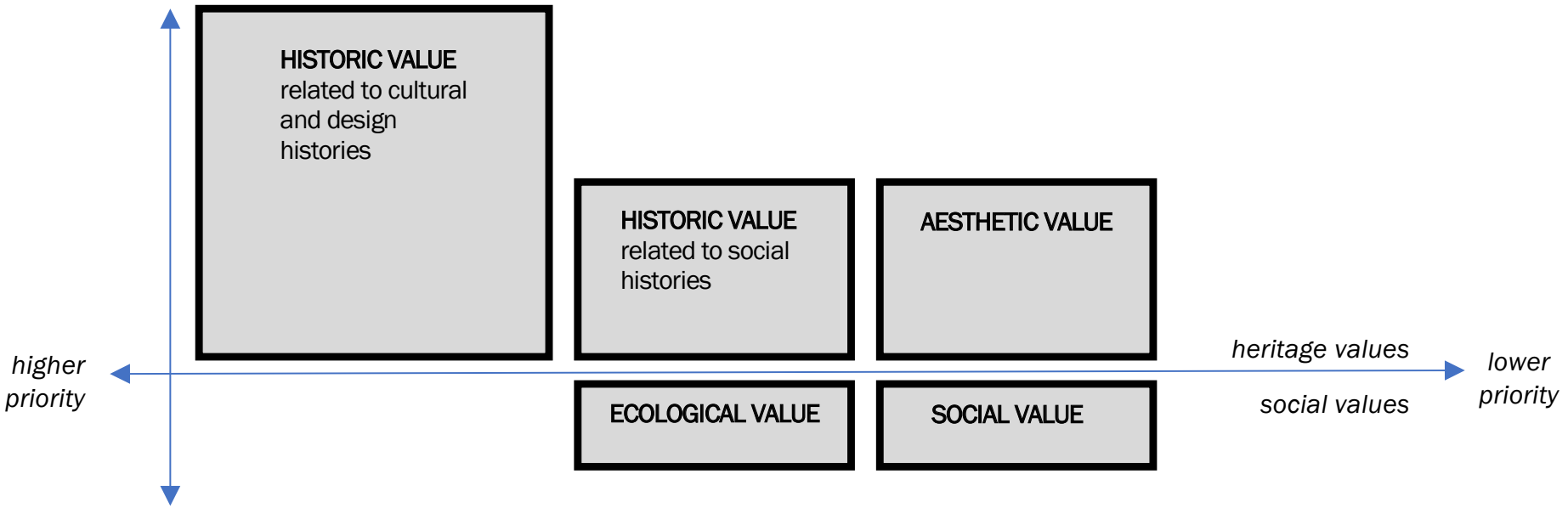
- The narrative description of significance rightly dwells on the quality of the MH&G's design; the authors note the strong, multiple connections between interior and exterior spaces, experienced in horizontal and vertical planes. They conclude that MH&G is the most elevated design expression of Modernism in a domestic setting. They describe the house design based on a Palladio-like grid, with functionally differentiated spaces at the four corners pushed and pulled to create a plan that pinwheels. They note that Kiley's landscape design, commissioned last, responded to the spatial logic already established by the siting, parti, program and detailing of the house.
- Whereas the NHL nomination's authors interpret the design significance wholly in terms of the three designers' careers (Saarinen, Kiley and Girard) the CMP research inidicates the Millers' substantial roles in the design and of course the decades of careful post-construction adaptions and additions;
- The NHL singles out Saarinen and Kiley. In this CMP, Saarinen, Kiley and Girard are placed on more equal footing in terms of their influence over the holistic design.[4] Acknowledgement of the entire design team (including Girard, Roche, Korab), and the relationships between them and with JIMand XSM as clients (including the close collaboration between Girard and XSM, for example) is an important aspect of the project's design significance. (This point is symptomatic of the now somewhat outdated myth of the architect/designer as singular hero. Indeed, Girard's and Saarinen's wives (Susan and Aline, respectively) contributed substantially to the respective firms.[5]
- The NHL's appraisal of significance emphasizes other Modernist designers uninvolved with the project—Mies, Hitchcock and Johnson, Schindler, Wright. This may give the mistaken impression that MH&G should be seen as derivative of these other designers' work. Further to this point, the NHL's authors emphasize style and genre—as opposed to the actual spatial qualities, design ideas, and material choices that distinguish the place.
- The Millers are nearly absent from the NHL's SoS. They should be more robustly acknowledged as actively engaged clients and owners (as noted above), and as patrons whose family transitioned the site into the care of Newfields. Additionally, JIM's significance on broader scales as a patron of modern design in Columbus as well as his distinguished life on a national stage as businessman, influential leader of civic and religious organizations, and even political figure adds to the significance of the MH&G.

The NHL listing offers more narrow an assessment of MH&G's values and significance than indicated by the CMP's analysis. It elaborates architectural values to the exclusion of others; the architectural values of MH&G are framed as derivative of other Modernists' work (Mies, et al). This assessment should be updated to foreground the contributions of MH&G's designers, and a fuller range of values deserving of conservation attention in the CMP looking ahead.

A later NHL theme study, titled "Modernism in Architecture, Landscape Architecture, Design and Art in Bartholomew County, Indiana from 1942-1965," was completed in 2000.[6] This update does a more thorough and balanced job of contextualizing MH&G and identifying its broader values beyond the design work regarded in isolation. The theme study acknowledged additional sources of the MH&G's value as assessed for the CMP:

- The study notes the extensive and early recognition of Columbus' design excellence owing to JIM's patronage and by extension that of the Cummins Foundation.
- The litany of Modernist projects in Columbus and Bartholomew County, most of them public projects but including the Miller House as well.[7]
- This much more balanced account of the significance of this large group of linked projects, and JIM's central role in them, place the MH&G in the pantheon of American Modernist design.

We also want to note the effect of previous documentation to fix in the public eye a perception of MH&G *as photographed*, particularly Stoller's and Korab's famous photographs. The photographs are beautiful, powerful, and memorable. Their power was amplified by the inaccessibility of MH&G (being a private house). And the photographs' power tends to reify the staged version of the place (staged for architectural photography), which is somewhat at odds with the evolving



[The size of the boxes indicate the relative contribution of different value sets to overall significance.]

Fig. 5.1. Values Diagram. Date: 2022. Credit: Penn Praxis/RM

nature of the MH&G as a home as documented in the archives and in this report.

Far from being an unchanging icon of modern design, our research emphasizes that MH&G has in fact changed and evolved in a number of ways over time: the purposeful adaptations by the Miller family, such as adding the pool; repairs and changes responding to failed elements in the original design and construction (entry drive plantings); replacement materials (terrazzo); adaptations required by conversion of the site from family home to museum site (conversion of the Maid's Room). These changes, and the processes of adaptation, should be taken into account in assessments of value and significance and in the CMP as a whole.

5.2 VALUES ASSESSMENT

The values assessment articulates the variety of distinct reasons why the MH&G is valued, used, and regarded as a heritage place. This normally takes the form of a typology, organizing the value types according to how they relate to heritage functions and conservation responsibilities. The typology begins with those values most essential to a place's heritage functions and moves on to include other non-heritage (social) values that also influence decisions about the place.

HISTORIC VALUES—related to Cultural and Design Histories

MH&G is recognized nationally and internationally as an icon of Modernist design—the most fully realized example of a domestic environment envisioned by a collaborative team of highly accomplished Modernist designers. The iconic status of MH&G stems from the well-known design principles embedded in the place: the use of grids and modules; the systematic space planning; sophisticated architectural systems (roof-skylights-beams); individual features such as the Conversation Pit, Storage Wall, and Locust Allée; its significant and largely in-tact furnishings and collections; and, most of all, the dynamic integration of architectural, interior and landscape design.

MH&G is more particularly valued because of its association with the careers and broad influence of these same three designers—Saarinen, Kiley, and Girard—and indeed with Roche, who played a central if not marquee-heading role.

The subtle adaptations to the original design accrue a certain value in the sense that they reinforce and prove the sustained clarity of the original conception. Cultural significance has not merely been sustained despite the modification and adaptations; they have strengthened the significance. On close inspection, the place is much more changeful than published perceptions (so strongly shaped by early, iconic architectural photographers' representations) tend to suggest. It is not simply a design masterwork crafted in 1957 and sustained in a pristine manner. Rather, the Millers had a nuanced appreciation for conserving, adapting, and modifying the place (with their design team) subtly, with purpose, and with deep understanding of the underlying/overarching qualities that distinguish the place. These qualities—consonant with the list of CDEs elaborated in the "Understanding" sections—included the spatial structure of the house and landscapes, the *parti* of interior and garden "rooms," and the use of high-quality materials and sophisticated architectural systems.

Finally, we note a scientific-technological sort of historical value related to the use of post-war building materials of a corporate-commercial quality (and designers practiced in corporate settings) in a private home. The industrial-systems intelligence with which the different assemblies and systems were integrated as part of the design is remarkable.

HISTORIC VALUES—related to Social Histories

The social history values of MH&G relate to the family's (and by connection the corporation's) enlightened civic philanthropy specifically directed at using design excellence and Modern design as pillars of the civic-industrial complex. This has given Columbus a lasting, national and international distinction. Though MH&G was the (almost entirely) private domain of this very public figure, this broader significance (nationally, not just in Columbus and Indiana) adds value and significance to the place. JIM's public profile as entrepreneur, leader of Cummins Engine Company, leader of civic improvement and national religious organizations, champion of Modernism; and his engagement in national politics, in the civil rights movement, and at Yale University are reflected in his family retreat on Riverside Drive.

AESTHETIC VALUE

MH&G is an integrated work of design that derives additional meaning and value when viewed holistically—as a total, expertly realized and carefully maintained work of architecture, interior design, and landscape architecture. It does not just bear the marks of the three great designers working on the project—the designs are carefully choreographed to connect while staying distinct, creating a whole experience that is greater than the sum of its parts. MH&G contributes to, and draws from, the extensive collection of aesthetically refined, Modernist civic and business architecture that distinguishes Columbus. And it is an extension of JIM and XSM's sensibility and appreciation for Modernist art and design.

Aesthetic experiences of the building and landscape proceed through spaces and paths of very distinct and distinguishing quality. These spaces and paths are strongly influenced by the very high level of quality of materials, control of light, refined construction, and careful maintenance.

An additional type of aesthetic value flows from the wide circulation of images of MH&G—going back decades, well before the place could be visited by the public. The influence of early, professional photography of the site lends an additional, visual value and recognizes the influence of the site far beyond those who were/have been able to experience it personally.

SOCIAL VALUE

Categorically, social values capture the non-heritage uses of heritage places—for gathering, for economic development and tourism, for political symbolism, etc. Social values are created by contemporary uses and therefore are susceptible to change by forces external to a site. The malleable nature of social values can present both threats to a site—tourism-derived values will disappear if the tourism market wanes—and an opportunity for cultivating more social values by inviting more partners, programs or uses into the management of the site.

MH&G was not envisioned as a public landscape, although it has occasionally been used for public-facing events (a Lady Bird Johnson visit in 1967, the Pritzker Prize jury in 1994, for instance).[8] Yet the place has acquired public value over time, particularly in its post-2009 phase as a museum space (and Newfields, the current owner, is a public-serving nonprofit institution). Though envisioned and long-managed as a private place (the family's home), MH&G yields social value to the greater Columbus community for a few distinct reasons: it represents the design excellence of the city's distinctive civic landscape, both in the abstract sense of an inaccessible place known virtually (this is termed bequest value) and in the literal sense of being a touchstone for Columbus' unique design milieu (the private domain of the visionary who created this legacy for the city); it is a prominent part of the large collection of notable Modernist buildings, landscapes, and spaces distinguishing Columbus; and perhaps most obviously, MH&G contributes to the economic values realized by tourism activities in Columbus, being one of the main draws for organized tours.

However, there is greater potential social value if regarded as a place where other publics, stories, and values can be engaged, environmental concerns can be addressed, or other public causes and concerns can be heard. For instance, MH&G could be a place where one learns about Cummins Engine Company's role in Columbus's history, learns about JIM's civic and national leadership roles and involvement in politics and civil rights, appreciates XSM's contributions to the design of the place, or senses the threat of climate change through interpreting the floods that have covered the site. (The caveat here, of course, is that these contemporary-focused value-building activities cannot undermine the core heritage [historic and cultural] values.)

ECOLOGICAL

MH&G is comprised of land that perforce has natural resources and ecological functions. Seen in broader geographical context, MH&G also possesses environmental value by contributing to larger ecological systems and benefits by sustaining, for instance, riverside buffers important in managing flooding of the Flatrock River. And its matrix of garden and service landscape elements support biodiversity and contribute to the resilience of the immediate area to environmental stresses (such as flooding, invasive species, and other ecological changes). All of these resources and relationships are threatened by the accelerated changes stemming from the climate crisis, raising the profile of MH&G's environmental values. As a kind of contemporary-facing social value, ecological values can be extended and amplified to respond to external demands and benefits related to larger ecological systems—as long as providing these ecological values does not diminish the core heritage values of the site.

5.3 SIGNIFICANCE

PURPOSE

A statement of significance (SoS) is a key to conservation planning—the orientation point and "mission statement" for preservation of the site in terms of why it is collectively valued. The statement synthesizes and prioritizes the varied articulations of value into a short and usable text. Because values change (according to changing contexts, new research, cultural innovation, etc.), statements of significance should be periodically revised. This revised SoS intends to be cumulative and evolutionary, building on previous documentation and assessments—in the NHL nomination, broader NHL theme study, and Newfields preservation policy—and restates the most current understanding of MH&G's cultural and social significance as a foundation for decision-making.

STATEMENT OF SIGNIFICANCE

The MH&G is an internationally significant work of design, recognized as a National Historic Landmark. The cultural significance of the MH&G draws most strongly on the excellence of its design, the involvement of a cadre of leading Modernist designers of the mid-twentieth century, and the role of its commissioning family (with their refined appreciation for Modernist art, design, and advocacy for Modernist corporate, civic and religious buildings in Columbus). In terms of total design, MH&G is among a handful of iconic works of domestic Modernism in the United States.

Saarinen, Kiley, and Girard each contributed their talent, however their collective work at MH&G constitutes a whole greater than the sum of its parts. While the design work of each is renowned in its own right, the integration and interplay of buildings, interiors, and landscapes represents an extraordinary level of mastery. The multi-layered, multi-faceted spatial integration of the different designers' work (achieved through spatial composition, choice of materials, shaping of light, organization of uses and flows) elevates the place beyond the distinctions of individual careers. Though Saarinen, Girard and Kiley collaborated elsewhere, MH&G stands apart as a deeply refined and integrated example of Modernist architecture, landscape architecture, and interior design. As individual designers, too, MH&G is also an important moment in each individual designer's career: Girard's synthesis of Modern design and folk art; Saarinen mastering corporate and domestic architectural cultures; and to Kiley, his "first truly Modern landscape."[9]
The cultural significance of MH&G also draws on the obvious but profound role of the Millers as clients and patrons. JIM and XSM were full participants in the design process resulting in the original realization of the MH&G in 1957. And, in a sense, the Millers were lead designers for subsequent changes to MH&G as a home for five decades, then its transition to a museum space. The context of Cummins Engines Company's patronage on Columbus' behalf—directed by JIM—adds public value to this intentionally private place.

Notwithstanding the widely recognized significance and representation of MH&G as an icon of Modern design—reinforced by the publication in popular media of iconic photographs and its relative inaccessibility to outsiders as a private residence, the place has evolved steadily and been subtly adapted over time. The Millers changed and adapted the place as their family changed; elements of the original design were replaced or adjusted, though never at a cost to the spatial structure, logic, and character of the original designs (and thus to the experience and integrity of the original design conception). The aesthetic qualities of the design imbue the site with distinct value to visitors. Experiences of light, texture, views, movement through the spaces bring the design to all the senses, shift with the seasons, and open a window onto the Millers' family life and personal values.

The period of significance for MH&G, given the values assessed here, corresponds with the period of the Millers' tenure—from 1957 to 2008 (the year J. Irwin Miller, Xenia S. Miller and their family moved in through XSM's death, leading to the change in ownership to Indianapolis Museum of Art the next year).

Finally, MH&G possesses social and ecological values that augment its cultural and historical significance as a work of design. Social value derives from its status and contemporary function as an historic site and civic asset in Columbus, Indiana, a place where significant design work and the historical legacies of the Miller family are learned, celebrated, and activated as assets for the tourism economy. The 14-acre property (the original 10-acre parcel and the added barn property) also possesses a measure of ecological value, in that the land includes riverbank,

forest, open space, and garden elements producing ecological, hydrological, and biodiversity benefits shared across the wider geographical frames of the neighborhood and the Flatrock River watershed.

5.4 CHARACTER-DEFINING ELEMENTS

Character-defining elements (CDEs) are the physical and experiential means by which values and significance are embodied in and communicated by the site. CDEs codify where and how values are inscribed or reflected in the place. Maintaining the presence, wholeness, and integrity of the CDEs (and by extension, sustaining the cultural significance they bear) is the core concern of conservation policies and practice. The status and condition of the site's CDEs are the main indicator of the site's integrity as a heritage place.

CDEs must be carefully defined for every individual heritage place, based on understanding of the site's history, evolution, design, use, and meaning. For MH&G, the elements include architectural systems as well as particular architectural materials, assemblies, structures, and spaces; they include plant and other natural materials used to construct landscape plantings, rooms, and spaces; they include particular items in the collection; and they include discernible spatial patterns, relationships, or experiences determined by the interplay of these varied elements.

Within each of the following groupings, CDEs are listed in rough order of priority within each of the following groupings, and described in greater detail in the "Understanding" sections—Sections 6, 7, and 8. Generally speaking, higher priority CDEs should have a lower tolerance for change—this will be reflected in Section 10, Conservation Philosophy and Policies.

CDEs Relating to the Overall Site

With regards to the whole site, the distinguishing characteristics (the CDEs) are manifested in these principles:

- Organizing design principles: spatial structure of grids, alignments, and distinct indoor and outdoor spaces, and qualities of space and light created by the architectural and landscape architectural designs
- The use of grids and modularity to structure space
- Unity/comprehensive quality of the design
- The distinct separation of more private and more public spaces, at several different scales (the whole site, access to and around the house, within the house at the scale of the family)

CDEs Relating to the Building (also refer to Section 6)

With regard to the House, the principal CDEs are identified as systems, and within each of the systems, the architectural assemblies and features.

- Visible, structuring systems: plinth and flooring; columns and beams; flat roof; skylights; opaque and transparent wall systems
- Fixed features: storage systems, screen walls, Conversation Pit, fireplace
- Invisible, service systems: HVAC systems, artificial lighting systems, entertainment systems and acoustics

CDEs Relating to the Landscape (also refer to Section 7)

With regard to the landscape and gardens, the principal CDEs are identified as plantings, spatial relationships, and aesthetic effects.

- Overall spatial structure and pattern, drawing on a variety of the specific design elements noted below:
  - Interwoven grids and *allées*
  - Linear buffers (allees, hedges) that have width
  - The site's two main horizontal planes (defined by Meadow and House), and the sectional relationships they establish for other aspects of the design
  - Direct relationships between Garden functions related to functional areas of the house functions (adults, children, public entry/service, private view to east)
- Grids of uniform plantings: apples in East Lawn; crabapples and multiple smaller grids in the Adult Garden
- *Allées*: Entry Drive, Honey Locust, oaks in East Lawn, maples south of Meadow
- Buffer hedges: staggered arborvitae hedges for the exterior

boundaries: single-thickness arborvitae and taxus hedges for some boundaries within the landscape

- Meadow: creating long, open views from House to forest edge
- Specimen trees on the margins of the House: beeches, magnolias
- Smaller-scale planar elements
- Naturalistic edge of the riverbank forest
- Hardscape and sculptural elements: pavers; plinths; gates; fountain in Adult Garden
- Seasonality of flowering plants

CDEs Relating to the Interiors and the Collection (also refer to Section 8)

CDEs related to interiors and the Collection includes elements such as carpets and window treatments, which represent an extension of architectural elements, as well as furniture and lighting which became focal points in the spaces:

- Key furniture and demountable lighting fixtures
- Window treatments
- Carpets and moveable floor treatments
- Fine and decorative artworks
- Color scheme

5.5 ENDNOTES

[1] Other useful sources on values-based conservation planning include: Australia ICOMOS, *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*, 2013, 2013, https://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf; Kate Clark, "Preserving What Matters: Value-Led Planning for Cultural Heritage Sites," *Conservation Perspectives 16*, no. 3 (Fall 2001); Harold Kalman, *Heritage Planning: Principles and Process* (New York: Routledge, 2014); Randall Mason, "Values and Sustaining Heritage," in *Handbook on Sustainable Heritage*, edited by Kalliopi Fouseki et al. (New York: Routledge, 2022).
[2] Laura Thayer, Louis Joyner, and Malcom Cairns, "Miller House," National Historic Landmark Nomination Form (Washington, D.C.: United States Department of the Interior, National Park Service, 2000), Newfields Archives.
[3] "Statements of cultural significance and policy for the place should be periodically reviewed, and actions and their consequences monitored to ensure continuing appropriateness and effectiveness." Section 26.4, *Burra Charter*, 2013.
[4] Girard's profile is better and more widely understood on the basis of scholarship published after the NHL was written, notably Todd Oldham and Kiera Coffee, *Alexander Girard* (New York: Ammo Books, 2011) and Mateo Kries and Jochen Eisenbrand, eds., *Alexander Girard: A Designer's Universe* (Weil am Rhein: Vitra Design Museum, 2016).
[5] Saarinen's first wife, Lilian Swann, was trained as a sculptor at Cranbrook and was involved in the early design of the Miller House before their divorce in 1954. Saarinen married Aline Louscheim, an art critic for the *New York Times*, in 1954. Alexandra Lange, "Love and Architecture," *The Design Observer*, November 12, 2009 https://web.archive.org/web/20091120212026/http://observatory.designobserver.com/entry.html?entry=11517. "While the role of Susan Girard in her husband's career has never been fully explored, it is clear that her support – both personal and professional – was instrumental in his success"; see Deborah Lubera Kawsky, *Alexander Girard, Architect: Creating Midcentury Modern Masterpieces* (Detroit, MI: Wayne State University Press, 2018), 5.
[6] "Modernism in Architecture, Landscape Architecture, Design and Art in Bartholomew County, Indiana, 1942-1965," National Historic Landmark Theme Study (Washington, D.C.: United States Department of the Interior, National Park Service, 2000), https://www.nps.gov/subjects/nationalhistoriclandmarks/upload/Columbus-FINAL-FOR-PRINTING-508-Compliant.pdf.
[7] "Modernism in Bartholomew County," NHL Theme Study, 26.
[8] "First Lady On Tour in Crossroads America," *New York Times*, September 24, 1967, https://timesmachine.nytimes.com/timesmachine/1967/09/24/105264596.html?pageNumber=204; Nancy Kriplen, *J. Irwin Miller: The Shaping of an American Town* (Bloomington, IN: Indiana University Press, 2019), 11.
[9] Kiley, quoted in Hilderbrand, *The Miller Garden,* 19.

6
Understanding the Buildings

6 UNDERSTANDING THE BUILDINGS

6.1 METHODOLOGY AND INTRODUCTION

In keeping with the design values and significance of the Miller House, this and the following sections have been organized to reflect the importance of understanding the whole site—buildings, interiors, landscape—without relative rankings. While character-defining elements are listed individually, each must be understood—and preserved—in relation to the whole. The sequence should not be interpreted to represent relative importance, but in fact relates to how the house is typically experienced, from exterior to interior.

Note that for Sections 6 and 7, character-defining elements are documented including:

- *Design and Construction History*
- *Prior Treatments*
- *Existing Conditions*

The building elements have been grouped not as individual features but as integrated systems, reflecting the way in which they were originally conceived and must be understood and preserved.

The conditions of building elements were assessed by: Pamela Hawkes of Scattergood Design; Michael Henry of Watson & Henry Associates; and Dorothy Krotzer and Preston Hull of Building Conservation Associates. Methodology included:

- Observation and documentation of existing conditions on June 1-4, 2021;
- Review of documentation on design intent, construction and previous maintenance. Note that this was limited to treatments of CDEs that were identified and/or recorded and available to consultants at the time of the report, and thus may not be a fully representative and inclusive list of all work previously done;
- Discussions of issues with Newfields staff; and
- Collaborative discussion and analysis with team members.

Accessible portions of building elements forming the exteriors and interior of the buildings were observed to provide a general assessment of current representative conditions. It should be stressed that this study involved no destructive testing or removal of surface finishes. An illustrated summary of the observations is included on the following pages.

Recommended policies to address observations are provided in Section 10.

STRUCTURAL FORM: THE GRID

6.2 PLINTH AND FLOORING SYSTEMS

Design and Construction History

Mirroring the roof literally and figuratively is a ground plane which extends 10 feet beyond the exterior walls. It transitions to a 15-foot earth terrace planted in dark green ivy. It was Dan Kiley who proposed reducing “the depth of the house podium from 25 to 10 feet and to use the captured space for ground cover and a few small trees.”[1]

Terrazzo. The original plans and finish schedule call for the floor plane to be clad in pre-cast pavers and white terrazzo, reflecting light falling outside and through skylights into perimeter rooms.[2] Subdivision on the 2-foot, 6-inch module lines reinforced the structural grid inside and out. The light-colored flooring becomes part of a continuous wrapping with the white walls and soffit that dissolves the boundaries of the spaces. Many of Girard’s carpet designs picked up on the square module as well. As executed, the materials and modules were refined. The exterior plinth was changed from pre-cast pavers (as shown in the detail in Fig. 6.6.3) to terrazzo.

Travertine. JIM later noted that “We tried to economize on some materials and then we gave up. Eero thought he could make beautiful pre-cast cement blocks for the floor. We had a few but they all turned to powder. Finally we broke down and settled for travertine.”[3] The entrance hall and living, dining and sitting areas—those which form the “pinwheel” of public spaces connecting directly with the exterior—were finished in Roman travertine in the same 2-foot, 6-inch module as the terrazzo.[4] The four private quadrants were also floored in white terrazzo, but it is subdivided into long, narrow modules measuring 15

inches by 5 feet, 0 inches and oriented east-west. The carport was floored with more practical and recessive black terrazzo.[5]

Ceramic Tile. Utility rooms, such as bathrooms and the walk-in freezer, were finished with ceramic tile.

Prior Treatments

Problems with the terrazzo arose soon after installation. Records indicate that the Millers had terrazzo at the corners of the house replaced as early as 1964, and possibly again shortly thereafter due to an unsatisfactory color match. In 1985, cracked terrazzo at the steel columns was replaced, resulting in a poor color match that is still apparent today. In 1994, the original installers honed down the surface, performed repairs to make cracks less noticeable, and sealed the terrazzo. However, by 2000 the terrazzo had deteriorated again to the point that the family was considering wholesale replacement, either in kind or with an alternative material. Following are key dates and treatments:

1964	Santarossa Mosaic Co., Indianapolis, replaced some exterior terrazzo at the corners of the residence.[6]
1976	Santarossa Tile Co. repaired large cracks in terrazzo inside and outside terrace. Small cracks were not treated, as it was determined that it "makes their appearance worse than at present."[7]
1976	Caulking of exterior base (terrazzo to slate joints) of House completed.
1979	John Fargo recommended regrinding the exterior terrazzo and "sealing with a permanent acrylic sealer having embedded in the surface a fine silica granule to provide a non-slip finish."[8]
1984	Discussion with Kevin Roche of various methods to replace the broken terrazzo at the base of the steel posts—granite versus pre-cast terrazzo—which "would be set to move easily as the steel post expands and contracts."[9]
1985	Taylor Brothers Construction removed and replaced "four column diamonds," replaced four panels at the Kitchen entry, replace broken and missing expansion joints.[10]
1989	Kevin Roche provided "a different mixture of chemicals [to form a poultice] for each type of stain," according to Owen Hungerford.[11] A month later, Hungerford reported that the "oil stain at kitchen door so deeply embedded that it could not be eliminated. Terrazzo joint repair, grouting and sanding by Taylor Brothers.[12]
1994	Terrazzo is cleaned regularly "in accordance with instructions from Kevin Roche's office" but "the surface is dull and cracked in many places." New round of refinishing work by Santarossa planned to "make most of the cracks unnoticeable, thus eliminating the need to replace any of the terrazzo panels" and "prevent further deterioration of the terrazzo, ...give us a new surface, good for 15-20 years."[13] New backer rods and sealant installed.[14]
2000	Santarossa representative notes that there were not nearly enough expansion joints in the original installation. They can fill the worst joints, "but the only thing to do to keep it from looking like a patch job is to completely redo the terrace."[15] Concern about impact of large equipment on landscape materials.
2003	Santarossa representative inspected the perimeter terrazzo terrace and reported that the terrazzo needed to be cleaned and sealed and there were "20 pieces of terrazzo at the kitchen entrance and at the carport entrance that are broken and need to be replaced." The brick pavers at the carport and kitchen entrance needed to be removed and reset; "the pavers have settled due to the vehicle traffic and this has caused the border terrazzo pieces to crack in places." Some work was carried out, but actual scope is unclear from the summarized documents.[16]
1964	Santarossa Mosaic Co., Indianapolis, replaced some exterior terrazzo at the corners of the residence.[17]
1976	Santarossa Tile Co. repaired large cracks in terrazzo inside and outside terrace. Small cracks were not treated, as it was determined that it "makes their appearance worse than at present."[18]

1976	Caulking of exterior base (terrazzo to slate joints) of House completed.
1979	John Fargo recommended regrinding the exterior terrazzo and "sealing with a permanent acrylic sealer having embedded in the surface a fine silica granule to provide a non-slip finish."[19]
1984	Discussion with Kevin Roche of various methods to replace the broken terrazzo at the base of the steel posts—granite versus pre-cast terrazzo—which "would be set to move easily as the steel post expands and contracts."[20]
1985	Taylor Brothers Construction removed and replaced "four column diamonds," replaced four panels at the Kitchen entry, replace broken and missing expansion joints.[21]
1989	Kevin Roche provided "a different mixture of chemicals [to form a poultice] for each type of stain," according to Owen Hungerford.[22] A month later, Hungerford reported that the "oil stain at kitchen door so deeply embedded that it could not be eliminated. Terrazzo joint repair, grouting and sanding by Taylor Brothers.[23]
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2003	Santarossa representative inspected the perimeter terrazzo terrace and reported that the terrazzo needed to be cleaned and sealed and there were "20 pieces of terrazzo at the kitchen entrance and at the carport entrance that are broken and need to be replaced." The brick pavers at the carport and kitchen entrance needed to be removed and reset; "the pavers have settled due to the vehicle traffic and this has caused the border terrazzo pieces to crack in places." Some work was carried out, but actual scope is unclear from the summarized documents.[27]

Existing Conditions

Terrazzo. The exterior terrazzo exhibits by far the most deterioration of any element or finish surveyed, consistent with the long history of repair. The most significant conditions noted were cracking and displacement.

Cracking is widespread but is most frequent at the four corners of the paving, near embedded steel columns, and at the south side of the house (Fig. 6.2.3). There is relatively less cracking at the west side of the house.

Displacement was noted at all four corners of the paving but was most significant at the southwest corner, where a substantial region of the paving appears to have moved as much as an inch away from the house (Fig. 6.2.2 and 6.2.3). These conditions are near the confluence of the House's subsurface drainpipes at their deepest point. It is possible that, in addition to thermal expansion and contraction, disintegration of the underbed, cracking of the structural slab, frost heave, soil settlement or leaks in the soil drains have also contributed to the movement and cracking of the terrazzo paving. Miller House staff were unaware of any past investigation into or cleaning of the subsurface drains.

At exposed edges of the terrazzo, the terrazzo panels and their setting bed now overhang the concrete slab on which they were installed (Fig. 6.2.4). It is unclear to what extent this is due to the upper layers sliding

relative to the lower layers versus the erosion of the setting bed. In any case, the lack of alignment has resulted in additional cracking and losses, likely from people stepping on unsupported terrazzo (Fig. 6.2.5).

The early and recurring problems with the terrazzo strongly suggest underlying problems in the original design and/or construction; the use of de-icing agents could also have contributed to deterioration. In 1994, the original installers noted that the terrazzo had been placed without adequate expansion joints. This alone may be responsible for much of the cracking and suspected movement of the paving, since thermal expansion across the length or width of the plinth could be as much as 4 inches and the terrazzo may not be constrained by the underbed. The forces of thermal expansion and contraction are in two directions at the corners. Further, the metal dividers were originally covered with U-shaped plastic covers, most of which eventually cracked and allowed water to corrode the dividers (Fig. 8.6.6). Movement of the paving has also resulted in increasingly wide joints, many of which have been filled with sealant that has since failed.

Staining was noted on the black terrazzo in the Carport, likely due to automobile fluid leaks and/or road salt.

The interior terrazzo flooring is in better condition than that on the exterior. Like the exterior corners, surfaces at the interior corners of the House are cracked. The most significant condition occurs in the Millers' Bedroom at the northwest corner of the House (Fig. 6.2.9). Depending on operating temperature, hot water heating pipes may be a factor in interior cracking of the terrazzo. The interior terrazzo appears to use the same plastic joint cover system as the exterior, but has endured much better inside. One area of rust was noted below the sink in the children's bedroom suite, but this appeared to be related to adjacent plumbing.

Travertine. The travertine floor units are cracked in isolated locations, particularly near the perimeter of the house such as the Dining Room (Fig. 6.2.10). More commonly, the thin grout joints between the units show signs of failure and previous repairs. Upon close inspection, it appears that the original grout remains in some locations. This white grout is consistent in appearance with an unsanded white Portland cement. At some locations, the early grout is missing or failing (Fig. 6.2.11). At many other locations, particularly near the entrance with more foot traffic, the grout is failing and has been covered or replaced by material that appears to have yellowed with age (Fig. 6.2.12).

Interior floor surfaces were protected with carpet runners and non-slip pads during the June 2021 site visit. This, and the fact that the site is closed during winter months, has done much to preserve the original finishes.

Ceramic Tile. Several tiles are cracked or missing in the cold storage room (Fig. 6.2.13). Some grout is missing in the cold storage room and showers.

Fig. 6.2.1 Exterior view of plinth, roof soffit and slate and glass walls. Date: 1953-57. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00337

Fig. 6.2.2 Cracked and displaced terrazzo at the southwest corner of the house. Note how the joint lines have shifted. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.2.3 Extent of displacement at the southwest corner of the house as evidenced by the protruding units in the bottom of the photograph. Note also that every unit is cracked. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.2.4 Terrazzo overhanging disaggregated setting bed and concrete slab at north side of house, typical. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.2.5 Broken terrazzo at edge, typical, likely due to the unsupported condition shown in Fig. 6.2.4. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.2.6 Most significant instances of corroding dividers due to plastic cover failure and water infiltration, northeast of house. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.2.8 Open joint between travertine and terrazzo at doorway between Dining Room and Kitchen. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.2.7 Note mis-matched replacement terrazzo and widened joint at arrow, where sealant has failed, typical. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.2.9 Multiple cracks in terrazzo are most significant in the northwest corner of the house. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.2.10 Cracked travertine in Dining Room. Date: June 2021. Photo credit: Building Conservation Associates

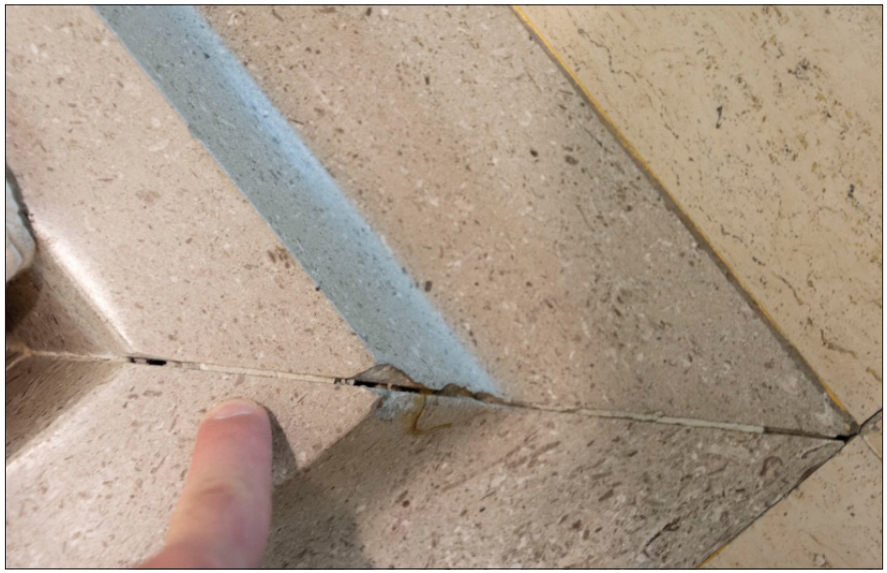


Fig. 6.2.11 Suspected original white grout at perimeter of conversation pit. Note the losses. Date: June 2021. Photo credit: Building Conservation Associates

6.3 COLUMNS AND BEAMS/STRUCTURAL SYSTEM

Design and Construction History

The structural grid communicates the rationality, rhythm, and modularity of the plan. As Saarinen wrote:

> We start by considering very carefully the problem of the site, the problem of the program and the problem of the spirit of the particular job… Then we start gradually trying to put the answers to these problems together and then, with them, we start putting in the structural systems. If everything goes well…and the structural system is the right one, with the right materials and methods…it becomes the thing which locks everything together…The structural system then seems to reinforce an inevitable solution to the site problem and, as the same time, an inevitable solution to the functional problems and, at the same time, an inevitable solution to the spirit.[28]

Sixteen X-shaped steel columns, finished in white baked enamel, are centered within the major grid modules of the Miller House. As David De Long notes, the "column shafts terminate in open capitals with cross-shaped profiles that link to regularly spaced linear skylights."[29] The column grid is independent of the program grid and the columns stand free of the walls, communicating the grid and their function as the load-bearing elements. Placing the columns at intersection of the skylights was, as architectural historian Jayne Merkel described, "a device conceived by Kevin Roche, who was so involved [with the project] that his colleagues called it 'Kevin's House.'"[30]

The office specified the following finish for steel elements:

- One coat DuPont Prep Coat No. 65-1055
- One coat DuPont body glaze putty (to fill irregularities, sanding when dry)
- Two coats DuPont "Duluxe" interior enamel—semigloss.[31]

Prior Treatments

None known, though regular application of paint is part of the maintenance routine.

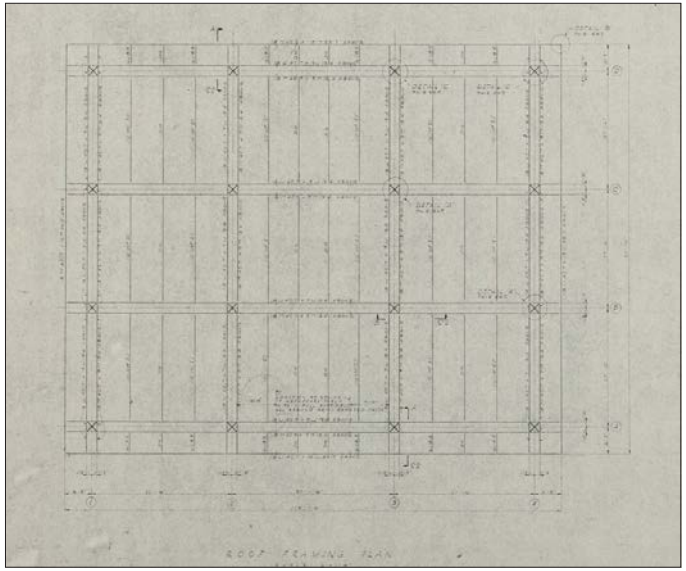


Fig. 6.3.1 Roof Framing Plan, showing column and grid locations. Date: February 18, 1955. Photo credit: MHG_IIIa_FF049_003, Miller House and Garden Collection (M003), Newfields Archives

Existing Conditions

In general, the painted finishes on columns are sound, but show evidence of repeated touch-up campaigns and caulking at open joints with the terrazzo (Figs. 6.3.3 and 6.3.4). In fact, the paint was being touched-up during the June 2021 site visit. Of particular concern is corrosion on several locations on the steel parapet/fascia assembly, such as the top of the parapet (Fig. 6.3.5), along the welded joint between the 15-inch-tall parapet channel beam and the 18-inch-tall fascia channel beam (Figs. 6.3.6 and 6.4.9). Debris and corrosion patterns at the parapet/fascia joint suggest a chronic issue.

The condition of protective coatings and steel in the roof cavities was not observed and the condition of steel when coatings were most recently applied is not known.

6.4 FLAT ROOF AND EXTENDED EAVES

Design and Construction History

Flat roofs are a hallmark of Modernist design. As the author of the feature on the MH&G in *Architectural Forum* noted, the 100-foot x 120-foot roof of

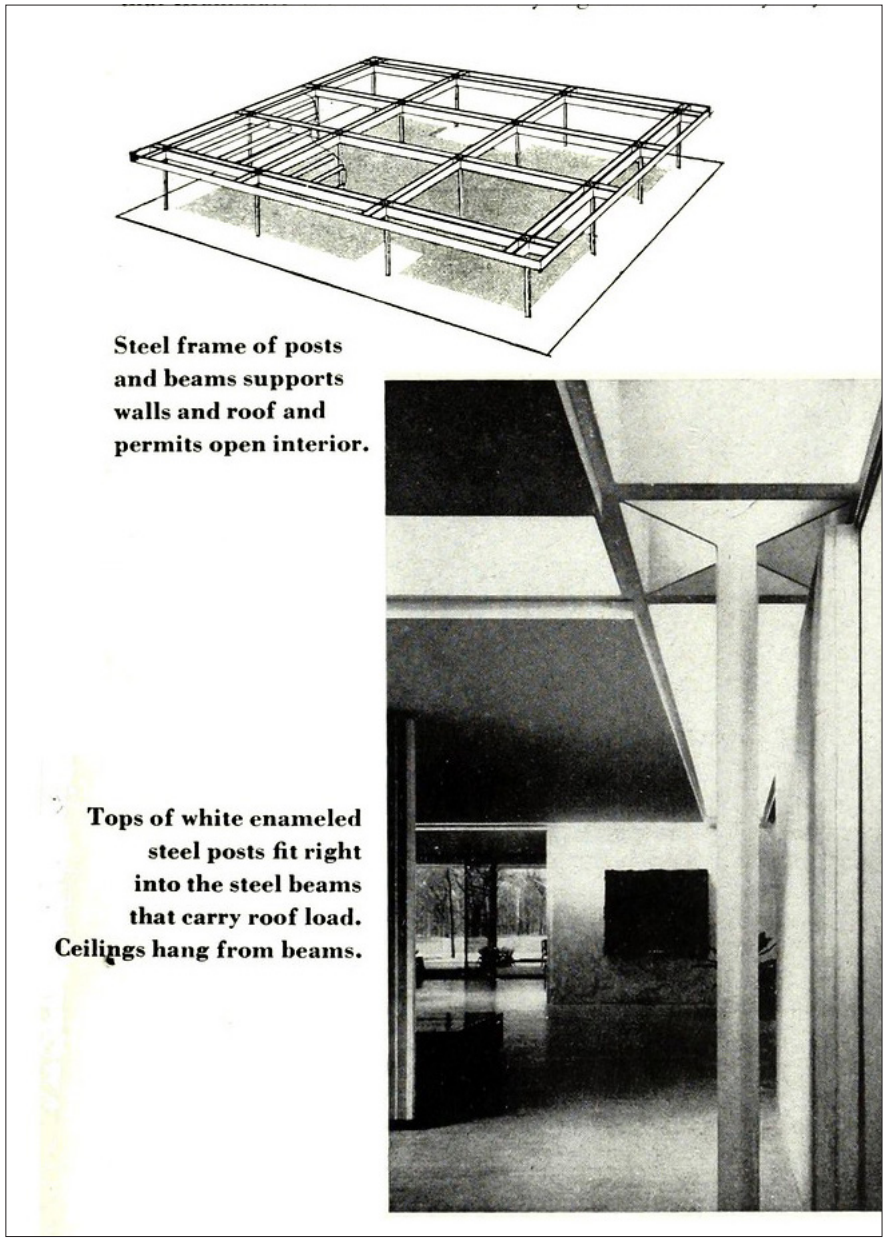


Fig. 6.3.2 Diagram of structural grid and detail of column capital from House and Garden. Date: February 1959. Photo credit: MHG_Ia_B001_f008_016, Miller House and Garden Collection (M003), Newfields Archives

Fig. 6.3.3 Note paint flaking and corrosion at base of column. Date: 2019. Photo credit: Michael C. Henry

Fig. 6.3.4 Detail showing caulking at base of column. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.3.5 Corrosion on the top of the parapet steel. Date: June 2021. Photo credit: Michael C. Henry

Fig. 6.3.6 Evidence of water ponding and past corrosion at the parapet/fascia joint. Date: June 2021. Photo credit: Michael C. Henry

the Miller House is “a simple and elegant unifier of the functionally complex plan.”[32] The roof and ceiling assembly hovers 8 feet, 6 inches above the floor. The structural grid and skylights separate the roof into twenty-five bays. Above the interior are nine major rectangular bays and the overhang above the terraces contains twelve linear bays and four corner bays (see Fig. 6.4.0). The bays are framed by eighteen-inch-deep steel perimeter channel beams. At the eaves, a fifteen-inch channel is set on the top flange of the primary channel, the channel webs being offset. The two structural members are exposed and articulate fascia (primary channel) and parapet (upper channel) at the edge of the roof. Elsewhere, a nine-inch channel is set on top of the primary channel and provides the mounting wall for the skylights. Like the columns, the steel fascias were painted white, with Dupont “‘Deluxe’ metal protective finish” specified.[33]

The cavity between the ceiling and the metal roof deck, approximately 18 inches high, contains the secondary roof and ceiling framing, the roof drainage piping, electrical systems and indirect lighting and the HVAC system ducts. The interior ceilings and exterior soffits are expressed as projecting panels, set on the exposed surface of the lower flange of the primary steel channel and further accenting the rhythm of grid defined by the skylights and the roof structure. Where exposed on the interior and exterior, the roof structure steel is treated as a finished architectural surface and is painted white.

The 1959 *House and Garden* article noted that the roof originally consisted of a 1½-inch metal deck, 1½-inch rigid insulation and a 4-ply (coal) tarred felt roofing system.[34] This is consistent with the original roof specification, which called for gravel or slag as ballast.[35] The ballast can be seen in Ezra Stoller’s 1958 photographs (Fig. 6.4.4).

The extended eaves of the roof are cantilevered 10 feet beyond the perimeter skylight and column line which stand just proud of the exterior walls, sheltering them from rain and snow and minimizing penetration of direct sunlight into the interior. Visually, the eaves convey a sense of weightlessness, especially at night, when the lighted skylights wash the exterior walls and illuminate the white terrazzo plinth and interior. The evening view by Ezra Stoller on the opening pages of the 1958 *Architectural Forum* article has become an iconic image of the design (Fig. 6.4.3).[36]

The interior ceilings and exterior soffits are identical in appearance and are set slightly below the flange of the perimeter steel, accenting the grid defined by the skylights and the roof structure. On the exterior, plaster reinforcing lath was to be used, the base for “cement plaster” to consist of three coats of the following mix (by volume):

- 1 part Portland cement
- 3 parts sand
- ¼ part lime putty[37]

Gypsum plaster was to be used on interior surfaces (such as ceilings) other than those where cement plaster or Keene’s Cement plaster was indicated. Brown and scratch coats were to be “wood fiber plaster,” and the finish coat to be “lime putty-gauging finish.”[38] Saarinen specified “DuPont Cement and Stucco Paint” for the cement plaster.[39]

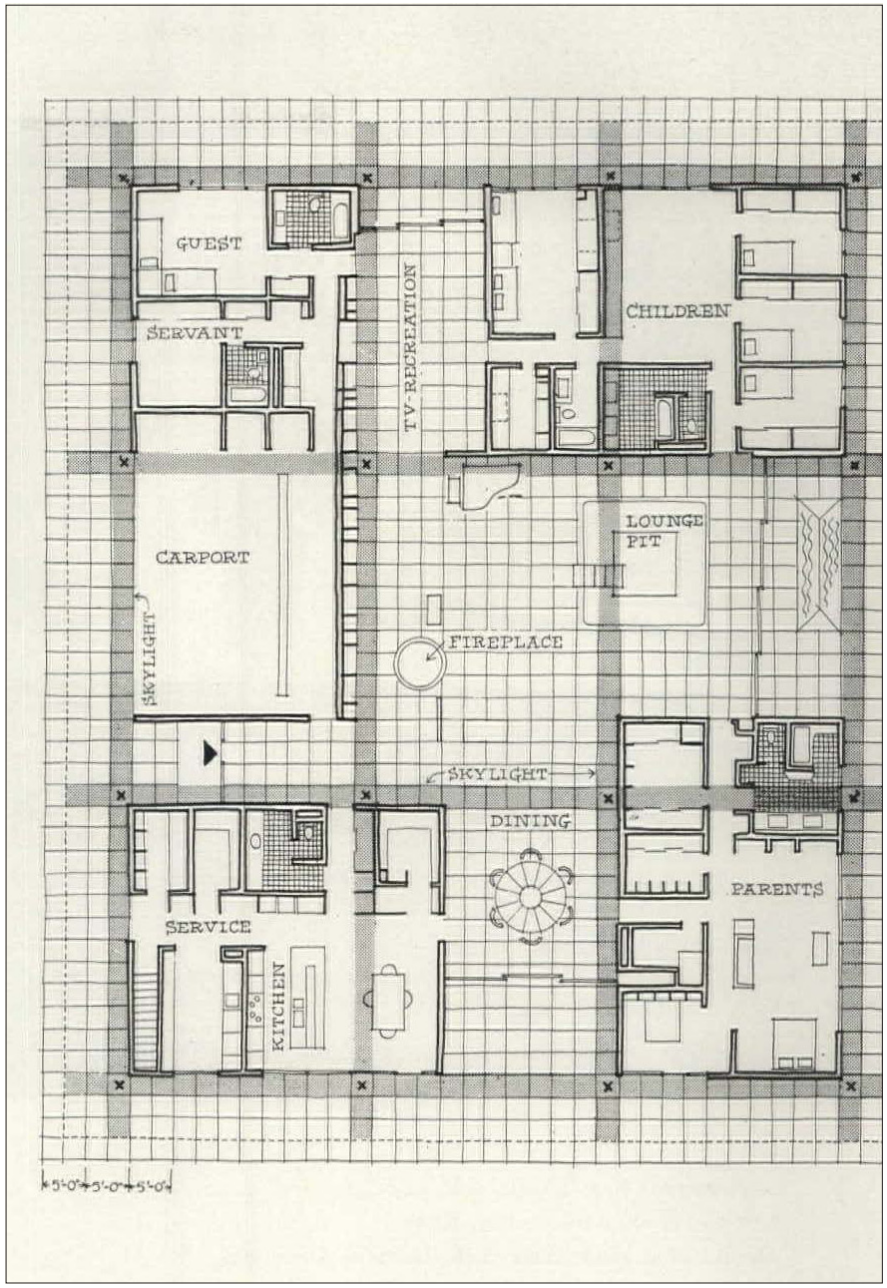


Fig. 6.4.0 Diagram showing overlay of skylights (in gray) on structural grid and room layout. Date: September 1958. Photo credit: Architectural Forum, from https://usmodernist.org/index-af.htm

Fig. 6.4.1 Detail of soffit. Date: 1953-57. Photo credit: Library of Congress Prints and Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00330.

Fig. 6.4.2 Roof and Skylights. Date: 1958. Photo credit: © Ezra Stoller / Esto 0031459

Fig. 6.4.3 Overhanging roof. Date: 1953-57. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00346

Fig. 6.4.4 View from corner featuring roof and overhang. Date: 1958. Photo credit: © Ezra Stoller / Esto 00031436

Fig. 6.4.5 Projecting soffit panel and exposed steel frame. Date: February 2019. Photo credit: Michael C. Henry

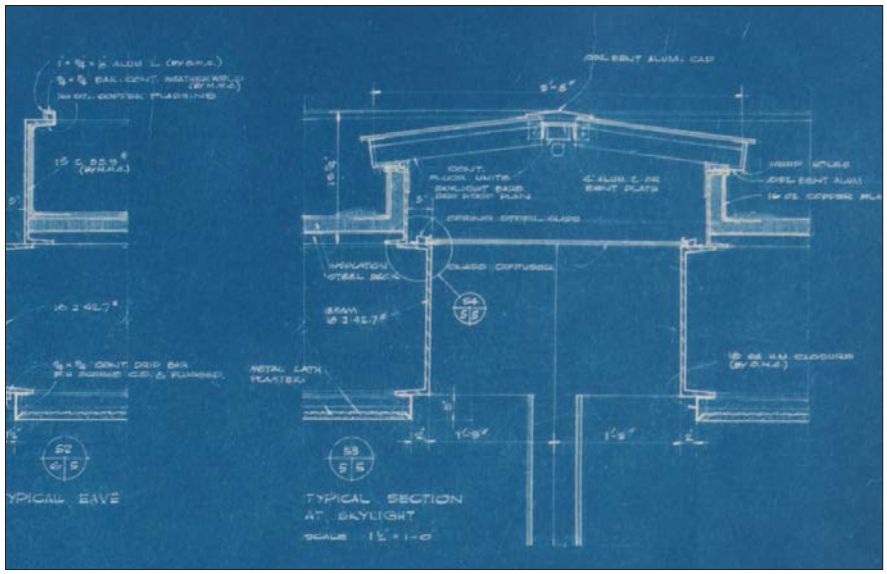


Fig. 6.4.6 Sections of roof assembly at eave fascia and parapet and at skylight from Sheet A5. Date: February 18, 1955. Credit: MHG_IIIa_FF041_010, Miller House and Garden Collection (M003), Newfields Archives

Prior Treatments

After hail damage and repairs in 1963, the roof required increasingly frequent repair. It was ultimately replaced in August 1977. The next roof replacement was in 2002.

1963	The roof sustained hail damage in April 1963, necessitating repairs.[41]
1977	Owen Hungerford memo to JIM "Roof information from Bill Folkert will be shared with K. Roche. Bill thinks if specs are correct and materials are of highest quality and if workmanship is first-rate, built-up roofs still are good for twenty years. I'll share with Bill for his comments the specs K. Roche has recently submitted for 2760."[42]
1977	The roof was replaced in August 1977.[43] The scope of work, specifications and costs are not archived. The work was apparently done by Hinshaw Roofing and Sheet Metal Co., Inc., based on an invoice for a subsequent repair undertaken by the firm in September 1993.[44]
1977	Small foot bridges were constructed over the skylights for construction access (Fig 6.4.6).
1978	Owen Hungerford letter to Bruce Detmers at RDA regarding possible resolution of soffit moisture damage by installing roof vents on bays with soffits.[45] O. Hungerford memo to K. Roche requesting guidance for selecting electric heat tracing and cables to prevent freezing in the roof drains.[46] No record of when the existing heat tracing was installed.
1979	28 turbine vents were installed in the perimeter and corner roof bays.[47]
1993	Subsequent roof repair by Hinshaw Roofing and Sheet Metal Co., Inc. in September 1993.[48]

2002	Based on a series of daily progress reports, the roof was replaced with a Sarnafil single-ply heat-seamed roofing membrane between mid-July and early August. Roof drain inlets and wood termination nailers were apparently replaced but the scope of work, specifications and costs are not archived. Workers cracked two bottom edges of skylights.
2009	Security cameras and cables were mounted on the roof.[49]
2017	Incident with the carport ceiling/roof drainage.[50]

Existing Conditions

Roofing System. The 2002 Sarnafil roofing system is inspected quarterly by the installer, Taylor Brothers Construction Co., Inc. The inspections are visual, and do not include non-invasive inspection methods, such as infrared thermography (IRT). IRT can be used to detect moisture that may saturate/deteriorate the underlying materials without detection as leaks in the soffits or ceiling panels. Examples of vulnerable materials that cannot be examined by direct visual inspection include insulation, the metal deck, adhesion bonding between layers of materials, metal fasteners, counter flashing and wood nailers.

Membrane. The roofing membrane appears to be adhered rather than mechanically fastened. The membrane terminates under the counter flashings at the perimeter parapets and at the curb walls of the skylights. Counter-flashing materials at the skylight curb walls appear to be original to the 1957 roof, but counter flashing and cap flashing on the top edge of the parapet appear to date to the 2002 roofing system. Where the roof membrane terminates under the copper counter flashing, steel lag screws perforate the copper counter flashing.

The existing roof membrane appears to be a single-ply heat seamed roofing system and probably consists of one of three membrane materials: EPDM (ethylene propylene diene terpolymer), PVC (polyvinyl chloride), or TPO (thermoplastic polyolefin). The typical service life of each material differs, with EPDM being longest (20 to 25 years) and TPO being shortest (12 Building Conservation Associates believes that the smooth-textured plaster represents the original intended finish, and that areas of more rough-to 18 years).[51] Actual service life is dependent on a number of factors, including substrate condition, initial installation quality, details at penetrations and edges, ponding, tree debris, climate, and maintenance. Age-related failure of older or original flashings and termination materials at the edges can shorten service life of the roof system before the membrane has failed.

The flat roof and skylight grid have provided a convenient platform for modern systems, such as security cameras, information technology and heat tracing for the roof drains. These systems have increased foot traffic and live loads on the roof for installation and maintenance. Roofing traffic pads and metal catwalks over the skylights have been installed to reduce damage. Cables, traffic pads, and wrinkling of the roof membrane have resulted in small areas of ponding and accumulation of leaf debris.

Based on the above, the present roofing system is approaching the end of its functional service life. The original 16-ounce copper counter flashings have become brittle from work-hardening during installation of at least three roofing systems and have been perforated by fasteners. The intersections of copper, steel, and aluminum materials have created an opportunity for galvanic corrosion.

The condition and thermal performance of the original 1½-inch-thick roof insulation is unknown and may have degraded due to compression, moisture, or embrittlement. For comparison with current practices, 1½-inch-thick closed cell extruded polystyrene insulation provides an R-value of 7½ foot2·°F·hr/BTU and the *2020 Indiana Residential Building Code* requires ceiling/roof assemblies to provide R-38.[52]

The mechanical resistance of the roof membrane and insulation to uplift from wind is unknown. This may be a particular problem because the skylights and parapets can generate negative pressures on the roof under strong winds, which are likely to increase with climate change.

Exterior Plaster Soffits. Today, the exterior cement plaster on the soffits varies in appearance and texture among the four sides of the house. In some locations, the plaster has a smooth texture (Fig. 6.4.10); at others, it has a rough texture (Fig. 6.4.11).

ly-textured plaster represent locations of previous repairs. No notes in the drawings or specifications have been found which would indicate the original plaster texture.

Likely as a result of the annual maintenance, the cement plaster does not exhibit notable deterioration despite known roof drainage issues.

Fascia. The paint on the steel of the fascia shows evidence of repeated touch-up campaigns (Fig. 6.4.9). In fact, the steel's paint was being touched-up during the June 2021 site visit.

Interior Plaster Ceilings. Relatively few problems were noted at the interior plaster ceilings (or their painted finishes). The exceptions were several areas of water damage associated with known roof leaks. The largest such area of damage is in the Children's Bedroom Suite at the southwest corner of the house; several other areas of damage are in the Office in the southeast corner of the house (Fig. 6.4.12).

6.4.2 Roof Drainage and Roof / Skylight Cavities

Design and Construction History

Each of the twenty-five flat roof bays of the Miller House has a drain, also referred to as a sump on the drawings. Because each of the roof areas are bounded by parapets and/or skylights there are no provisions for secondary drains or overflow scuppers in the event of blockage of a roof drain by debris, ice dams at grates, or ice blockage of pipes. The roof drains are routed through the roof cavities, with groups of two to four roof sumps draining to nine interior downpipes to the roof drain collector pipe system in the basement, separate from the sanitary waste collector pipe system. The roof drains ultimately discharge to the storm sewer system along the south side of the property.

According to the drawings, the diameter of the lateral roof drain ranges from 1½ inches at small corner bays to 2½ inches at main bays, but the slope is not documented. Down pipes are 3-inches in diameter. Detail 51 on drawing A-5 indicates that the roof drain conductor serving an eave scupper crosses the skylight cavity within a concealed space formed by a roof channel beam and a steel closure plate (Fig. 6.4.13).[53]

Fig. 6.4.7 Roof bays over garage (center) and kitchen (left) with mechanical ventilators, access bridges and security camera. Note overhanging trees. Date: June 8, 2020. Photo credit: Newfields.

Fig. 6.4.8 Copper counter flashing perforated by steel fasteners (right). Non-original cap flashing on parapet (left). Date: June 8, 2020. Photo credit: Newfields.

Fig. 6.4.9 Turbine ventilator and debris guard on roof drain on corner roof bay. Note electrical conduits and cables for security cameras and for heat-tracing at the roof drain. Date: June 8, 2020. Photo credit: Newfields.

Fig. 6.4.11 Cap flashing on parapet. Note corrosion on top flange of steel channel beam. Date: June 8, 2020. Photo credit: Newfields.

Fig. 6.4.10 Accumulation of sealants at intersection of roof and skylight. Date June 8, 2020. Photo credit: Newfields.

Fig. 6.4.12 Evidence of many touch-up campaigns at fascia of steel eaves, southwest corner of house. Date June 8, 2020. Photo credit: Newfields.

Fig. 6.4.13 Lightly sanded plaster finish adjacent to recessed lighting may represent original surface texture. Date: June, 2021. Photo credit: Scattergood Design

Fig. 6.4.14 More roughly-stippled plaster finish may be a later repair. Date: June, 2021. Photo credit: Scattergood Design

Fig. 6.4.15 Largest area of plaster damage due to roof leaks, in Children's Playroom/ Mrs. Miller's Office. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.4.16 Yellowed later repair grout, typical. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.4.17 Cracked floor tile in bathroom. Date: June 2021. Photo credit: Building Conservation Associates

Prior Treatments

Late 1980s	Expanded metal mesh debris screens installed over drains and catwalks.
2007	Debris screens repainted.
2011	Soffit leak that required new plaster panel refacing on southwest corner/south side.
2017	Roof drain line joint failure, Carport ceiling damage.[54]

Existing Conditions

The capacity of the roof drainage system and the downstream site drainage system are not documented. With climate change, the capacity of the roof drainage system may be exceeded in heavy rains and, since secondary drainage cannot be provided due to the partitioning of the roof bays by skylights, the consequences of an overloaded drain could result in interior water damage.

From the drawings, and limited field observation, it is not clear if the cavities of the perimeter and garage roof bays and skylights were originally thermally isolated from the roof and skylight cavities over the heated spaces.

The purpose of the large turbine vents, installed in 1978, is not documented. They may ventilate the cavities between the insulated roof assembly and the uninsulated plaster ceilings (interior) or uninsulated plaster soffits (exterior). Ventilating the roof/ceiling cavities may reduce heat gain through the ceilings in summer. In winter, ventilating the roof ceiling cavities will increase the heating load, especially since some of the roof cavities contain ducts for the HVAC system. Lowering the temperature of the cavities in winter may lower the roof temperature increasing build-up of snow/ice on the roof and increasing the risk of freezing of the roof drain conductors passing through the cavities.

The roof scuppers and drain conductors are heat traced. According to MH&G staff, the power cables penetrate the roof deck through an exhaust vent and are routed across the roof to the individual drains.

During the February 2020 site visit, condensation on the painted plaster soffits was observed at the eaves; a mild, moist weather system had arrived after a sustained cold period. The condensation may have been aggravated by cooling of the eave cavities by the turbine vents. During winter there is risk that high interior relative humidity and dew point temperature can result in vapor migration into the cavities and condensation on cold steel framing or metal roof deck (See Section 6.14).

6.5 SKYLIGHTS AND ARCHITECTURAL DEFINITION WITH NATURAL AND ARTIFICIAL LIGHTING

Design and Construction History

As noted in the National Historic Landmark nomination, “one of the most distinctive features of the house is the continuous channel of skylights along the lines of the column grid.” Bands of skylights border the exterior walls and central interior space, highlighting literally and figuratively the relationship between the roof structure and spaces below and “creating an effect in which light itself seems to delineate component parts of the house, suggesting separation without physical

barriers."[56] Will Miller noted that, though the skylight channels are continuous, in the private areas, they only appeared where they were "useful," such as over vanities in bathrooms.[57]

Skylights were specified as manufactured by O'Keeffe's Inc., San Francisco, CA.[58] The aluminum frames are set above the roof plane on channel steel curbs which are welded to the roof channel beams. The 22-by-30-inch sloped units of ¼-inch "Fractrolite" wire glass were set in the skylight frame. A "translucent glass diffuser" of 1/8-inch thick "pentecor" pattern glass from Mississippi Glass Company was set on the edge of the top flange of the roof channel beams as a laylight.[59] The back of the 18-inch tall channel web, exposed below the laylight, is painted white. Where skylights intersect above structural column, crossed steel plates form "capitals" and baffle for the light from above. "Continuous fluorescent [tube] units" fastened to the underside of the skylight ridge frame cap provided artificial light at night.[60]

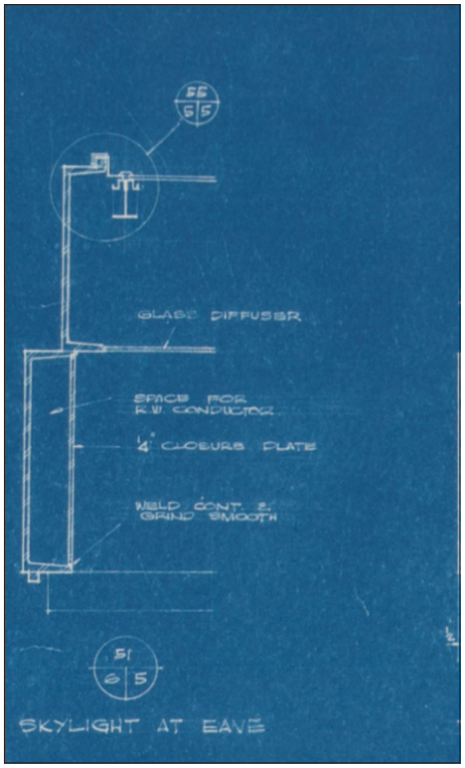


Fig. 6.4.18 Drawing details of roof assembly, Sheet A5. Detail 51 shows concealment of roof drain. Date: February 18, 1955. Credit: MHG_IIIa_FF041_010, Miller House and Garden Collection (M003), Newfields Archives

Fig. 6.4.19 Condensation on plaster soffits. Date February 2019. Photo credit: Michael C. Henry

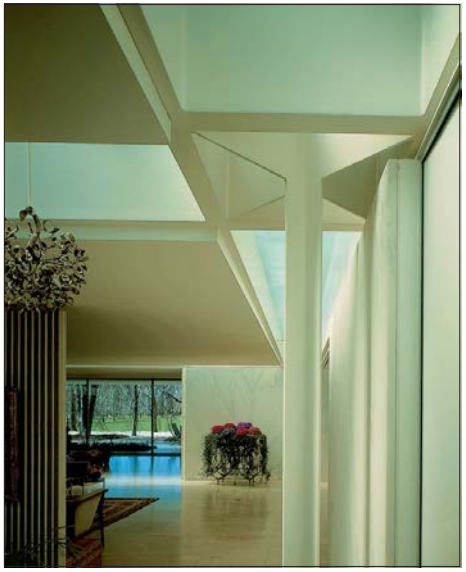


Fig. 6.5.1 Skylight and column capital. Date: 1953-1957. Photo credit: Library of Congress Prints and Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00374.

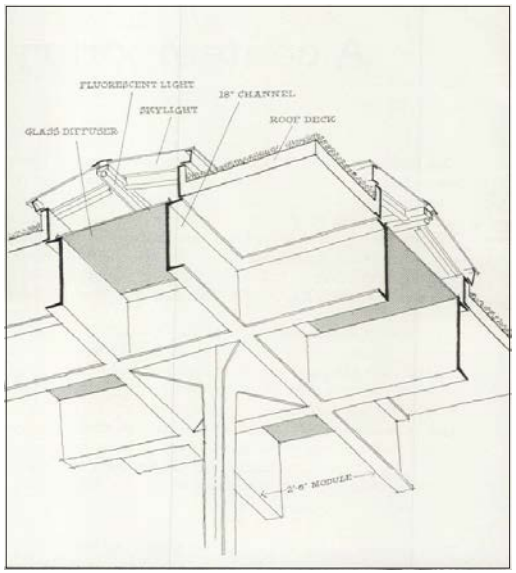


Fig. 6.5.2 Skylight diagram. Date: September 1958. Photo credit: Architectural Forum from https://usmodernist.org/index-af.htm

Fig. 6.5.3 Skylight over master bathroom. Date: 1953-1957. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00387

Prior Treatments

The first skylight installation lacked provisions to accommodate differential thermal expansion between the skylight curb beams and the skylight ridge beam and the ridge beams were modified to allow for up to 1¼ inches of expansion over the 120-foot length of a skylight.[61]

The skylight glazing is coated with whitewash on an annual basis as a maintenance activity.

1957	Expansion joints added to the skylight frames.[62]
1963	21 panels of skylight glass were replaced due to hail storm.[63]
1968	Ultraviolet filtering Plexiglas panels were placed on the glass diffuser panels to protect artwork from sun damage.[64]
1972	All skylights to be reglazed with specified sealants.[65]
1974	Fluorescent light ballasts replaced in skylights.[66]
1994	Necessity of replacing 30-year-old UF3 Plexiglas panels in skylights was investigated and idea rejected because Rohm & Hass President told JIM that effectiveness was not lost over lifetime.[67]
2006	Skylight repair and replacement by Taylor Bros. construction.[68]
2020	Fluorescent light fixtures and lamps replaced with light-emitting diode strip lights.[69]

Existing Conditions

The intersection of the skylight assemblies with the counter flashing and roof show the accumulation of multiple sealant campaigns over more than sixty years. The thick build-up of sealants may have plugged drains at the base of the skylights that are intended to wick away interior condensation from the glazing. These are a critical feature, especially if the building interior is humidified.

The accumulation of sealants precludes the successful application of new sealants over old sealants, therefore, termination of a replacement roof mem-

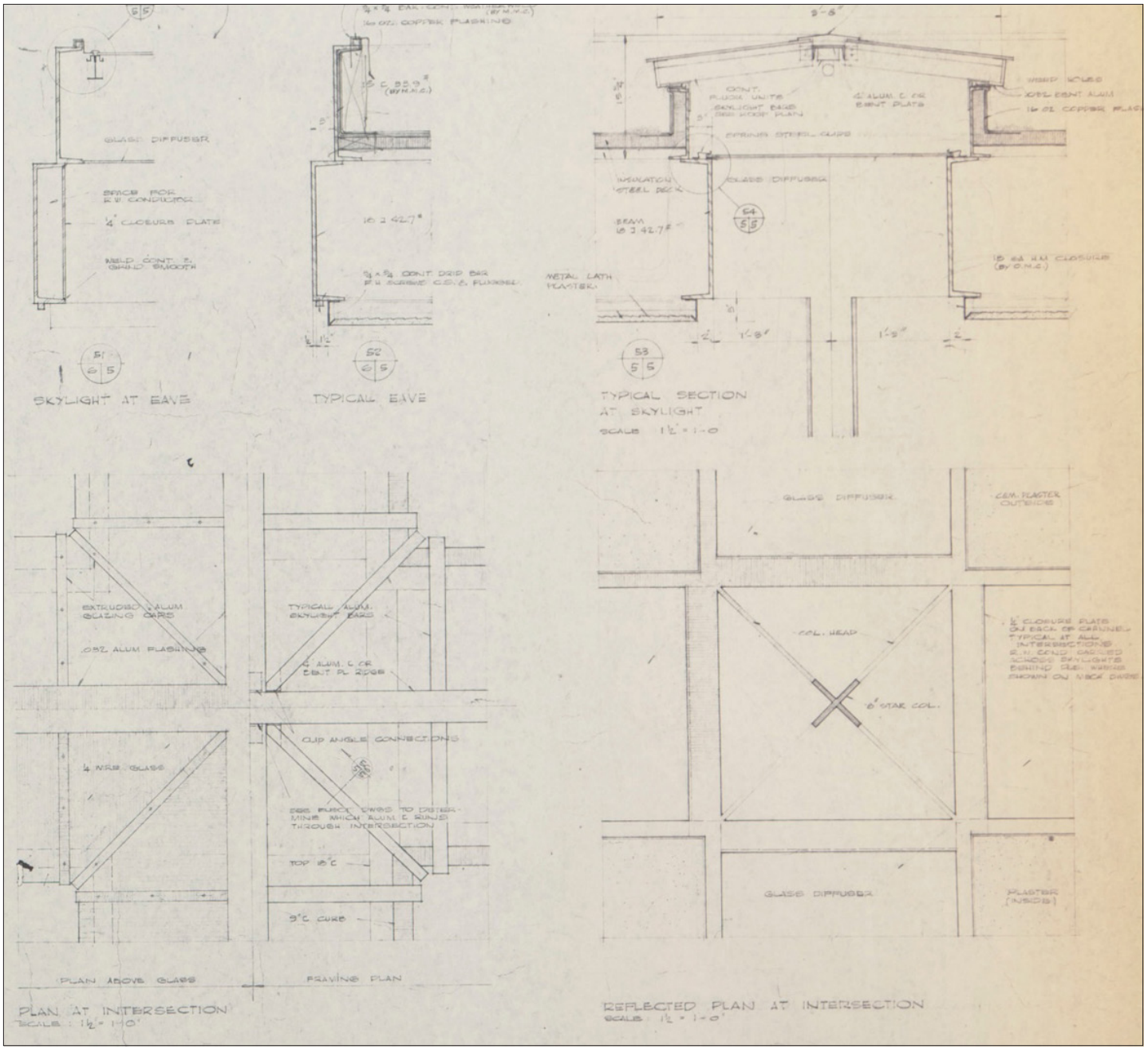


Fig. 6.5.4 Skylight details. Date: February 18, 1955. Photo credit: MHG_IIIa_FF041_011, Miller House and Garden Collection (M003), Newfields Archives

Fig. 6.5.5 View of skylight and laylight from below. Date: 2019. Photo credit: Michael C. Henry

Fig. 6.5.6 Close-up of patterned surface of wire glazing for skylight. Note also whitewash finish, which was traditionally applied annually. Date: June 8, 2020 Photo credit: Newfields.

brane and correction of damage to the counter flashings will necessitate removal of the sealants to bare/painted metals as well as possible repair of corroded metals.

The skylight glazing may be difficult to remove and reset without some statistically inevitable breakage. Taylor Building Construction may have a reserve supply of replacement glazing, but a shortfall is likely, and exact match of the original glazing may be difficult. Replacement glazing should closely match original in diffusion and visible light transmission; ultraviolet filtration would be beneficial. If replacement is undertaken, intact pieces of original glazing should be entered into the collection as architectural artifacts.

6.6 OPAQUE WALL SYSTEMS

Design and Construction History

The House is wrapped with a taut envelope that forms a continuous surface. Exterior and interior walls read as simple planes, with floor-to-ceiling expanses of glass interrupting panels of stone. As noted in the National Historic Landmark designation:

> Where the exterior walls are parallel with the perimeter, they are clad with full-height five-foot-wide panels of cleft-finished black slate. Each slab of stone runs from the floor to the underside of the fascia. Where the walls are perpendicular to the fascia, the cladding is a gray-veined white marble. Where windows occur, they are treated as infill between the slabs of stone.[70]

The uniform exterior envelope is interrupted only by four asymmetrically placed “loggias” created by recessing the doorways 10 feet (four modules) from the perimeter. This provides greater protection from wind, rain or snow while also emphasizing the entries. The color and texture of the different stones are enhanced by the linear skylights positioned above them, which provide a play of natural light during the day and artificial light at night. The slabs are separated by very thin vertical joints filled with grout.

Slate. Black slate panels measuring 5 foot, 0 inches by 8 foot, 6 inches on the exterior help the house to recede into the landscape; XSM explained the design choice stating, “The slate facing of the house was inspired by what we saw in England.”[71] The walls were constructed of 8-inch thick

concrete block with 1½-inch rigid insulation applied to the interior face of masonry.[72] The slate was to be Buckingham, Virginia slate with a "natural cleft finish."[73]

In August 1956, L.D. Hoffman reported to JIM:

> The slate was finished last week. In answer to your question of satisfaction by everyone concerning the slate, there are no objections, except for the warped condition of some pieces. As Tom Dorste says, there is nothing that can be done about it. After plastering is completed, only close scrutiny would detect the warpage. I've tried to show one example of warpage in a picture....Tom Dorste says this warping is a result of splitting the slab from the original block vs. cutting as was the case with the marble.[74]

The memo was accompanied by photographs with the comment: "Notice at the top of the photo how far [the slate] is from the wall vs. the bottom" (Figs. 6.63A and 6.63B).[75]

Marble. Walls of the Living Room were specific as "Broche Noire-polished finish;" other marble walls were to be "Madre Cream Alabama" with "white-sand sawn finish."[76] With the highly-polished white terrazzo flooring, it fills the central living space with light.

According to the original drawings, both types of slabs were to be anchored into concrete block backup masonry. A membrane flashing was to be installed behind the bottom of the slab and under the terrazzo below. All perimeter joints were to be caulked, between the slab and the concrete backup at the top and sides, and between the slab and terrazzo at the bottom. The slate and marble slabs were to have a nominal thickness of 1¼ inches and the joints to be caulked were to be approximately 3/8 inch. The 1959 *House and Garden* article pointed to the ease of maintenance in slab choice, the author stating: "Walls are silicon treated for easy upkeep; floor never needs to be waxed."[77]

Plaster. According to the original specifications, the wall plaster was applied to gypsum lath (a product similar to drywall) with a three-coat gypsum plaster system.[78] The scratch and brown coats were reinforced with wood fiber, and the finish coat gauged with lime. Walls are finished with a painted metal base.

Wood. The walls of the Coat Room off the main entrance are covered with vertical wood slats.

Wallcoverings. In select rooms, the plaster was covered with wallpaper or fabric. This includes: a light brown rice paper in the Powder Room and light gray-blue silk in the Master Bedroom.

Ceramic Tile. Square, off-white, matte-glazed ceramic tile with white grout is used for the full height of walls in bathrooms, matching that on floors.

Glass Mosaic Tile. Blue glass mosaic tile is installed on the wall behind the stove in the kitchen (Fig. 6.6.9). The specifications call for a product called "Vetrotex," distributed by the Andrew R. Maglia Company of Detroit, Michigan.[79]

Micarta Laminate. Interior walls not clad in plaster or marble are covered in Micarta, a composite plastic laminate system produced by Westinghouse as early as 1910 (Fig. 6.6.7). At the Miller House, Saarinen specified that visible Micarta was to be 1/16-inch thick "standard grade" applied to plywood, while the unexposed face of any such plywood was to be clad in "back grade" Micarta "to balance stresses."[80] Micarta was typically white, with full-height vertical wall panels bounded by aluminum trim. These are typically located next to doors (also clad in Micarta) and used to organize light switches and other mechanical or electrical devices (Fig. 6.6.8). Micarta was also used for countertops in the kitchen, laundry, bathrooms, and for other built-in furniture around the house.

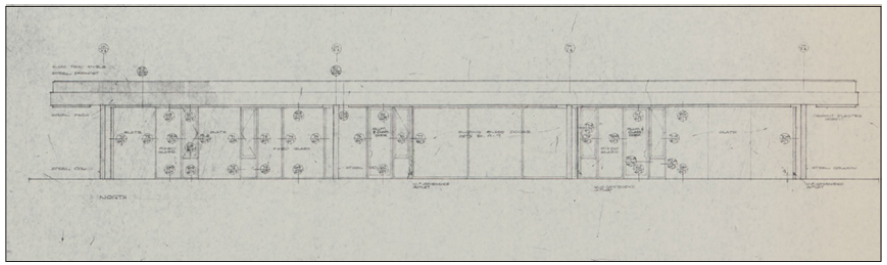


Fig. 6.6.1 Exterior Elevation. Date: February 18, 1955. Photo credit: MHG_IIIa_ FF041_013, Miller House and Garden Collection (M003), Newfields Archives

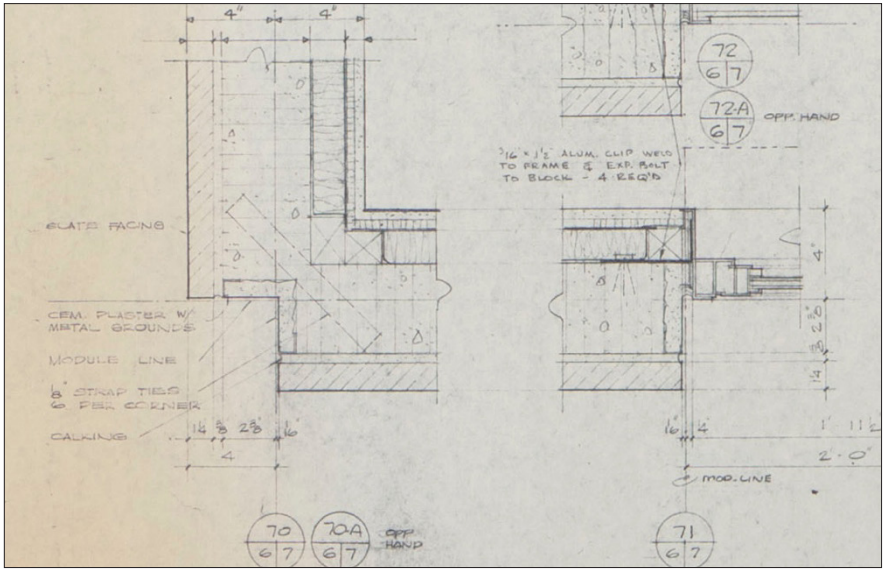


Fig. 6.6.2 Plan details of exterior slate wall system, including outside corner. Date: February 18, 1955. Photo credit: Miller House and Garden Collection (M003), Newfields Archives

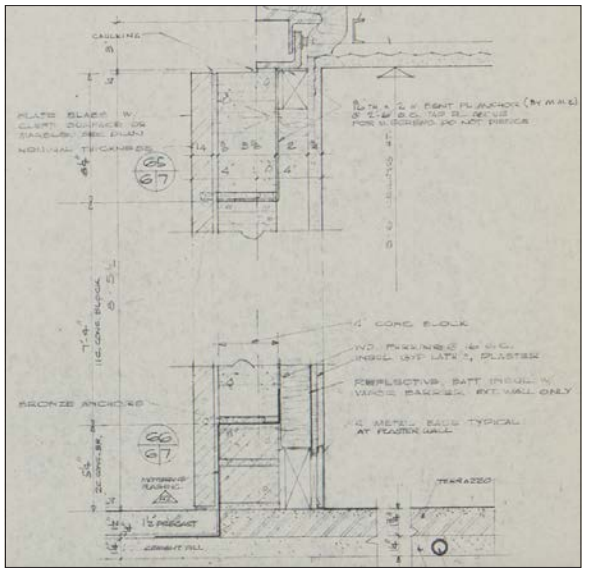


Fig. 6.6.3 Details at corner and base of exterior walls, showing the slate and interior plaster wall installation. Note that the exterior terrazzo was originally indicated as precast concrete. Date: February 18, 1955. Photo credit: Miller House and Garden Collection (M003), Newfields Archives

Fig. 6.6.5 View of wall paper in Power Room. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.6.3A "Slate on east side of Guest Wing. The verticle [sic] streaks are a result of washing. They will be removed when slate is oiled." Date: August 24, 1956. Photo credit: MHG_Ia_B001_f003_016-022, Miller House and Garden Collection (M003), Newfields Archives

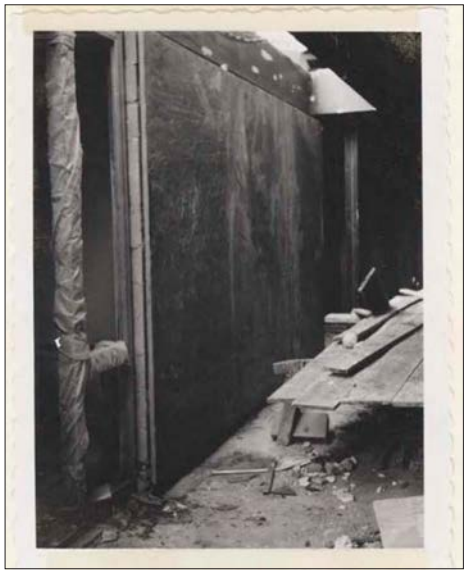
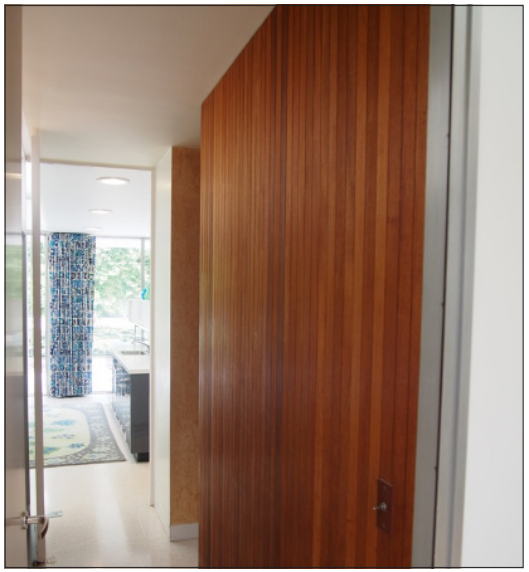


Fig. 6.6.3B "This slate is on the north side of Master B.R. Notice the texture of its finish. The end of the first slab does not show as much warpage as the other slate by car port." Date: August 24, 1956. Photo credit: MHG_Ia_B001_f003_016-022, Miller House and Garden Collection (M003), Newfields Archives



6.6.6 Wood slat finish in hallway between Coat Closet and Powder Room. Date: June 2021. Photo Credit: Scattergood Design

Fig. 6.6.7 Excerpt from a 1950s Micarta publication for architects and specifiers. Date: n.d.. Photo credit: APT Building Technology Heritage

Fig. 6.6.8 Typical Micarta door and wall panel assembly with stick aluminum framing. The wall panels typically formed enclosures for wiring, light switches and/or ductwork, as in this photo. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.9 Glass mosaic tile in Kitchen. Date: June 2021. Photo credit: Building Conservation Associates

Prior Treatments

Additional research into archives may yield more information about the wall coverings.

Existing Conditions

Slate. At many locations, the current condition of the stone slabs does not match the original drawings. Based on archival evidence cited earlier, it appears that some discrepancies have existed since the time of construction, though others may due to later movement.

At the top of most slabs, the joint between the slab and the concrete unit masonry wall is open, and in other cases the joint is filled with mortar (Fig. 6.6.10). In no case is there evidence of a sealant at this joint, as was specified in Detail 65 of the exterior wall details blueprint.[81] Many of the voids between the slate slab and the mortar bedding or the concrete unit masonry exceed 3/8 inch, and in some cases are greater than 1 inch (Fig. 6.6.11). To some extent, these large gaps may be due to variations in the thickness of the slate slabs, likely the result of natural cleavages in the stone; the rougher side of the stone was mounted facing inward, resulting in an uneven distance between the relatively flat concrete unit masonry and the slate (Fig. 6.6.11). In any case, the gaps may have been too large to caulk at the time of installation.

Several factors may have contributed to the failure of many of these mortar joints: the width of the gaps, the inflexibility of the material during seasonal changes, and perhaps diminished adhesion due to the impermeability of the slate. In many locations, bedding mortar and other residue was noted in the cavity between the stone and the masonry wall, raising the possibility that the stone is being wedged away from the masonry wall (Fig. 6.6.12). The drawings show bronze anchors set in the slate slab and the concrete masonry wall but there are no details as to size, spacing or depth of embedment and their resistance to lateral movement is unknown (Fig. 6.6.3). Fortunately, no evidence of water infiltration into these cavities was noted, despite the house's known roofing and drainage issues.

At the bottom of the slabs, sealant is missing in some locations, which allowed the team to note that the slabs do not appear to rest on the terrazzo as originally detailed. Rather, the terrazzo appears to stop short of the slabs (Fig. 6.6.13). It is possible that construction sequencing required the

terrazzo to be installed after the stone slabs. It is also known that much of the terrazzo has shifted since construction, which may explain the gap (see Section 6.2). In any case, it is unknown whether any material supports the stone slabs from below, or whether they are hung entirely from anchors.

Several other conditions were noted at the slate cladding:

- Vertical hairline cracks were noted in several slate slabs (Fig. 6.6.14). It is unknown whether these cracks are inherent to the stone or are related to the open joints noted above.
- Suspected guano was identified on the face of some slate slabs, consistent with the reported nesting of bats in the vicinity. The guano appeared to be staining the stone.
- Some of the sealant used at the vertical joints between slate slabs appears to be staining the adjacent stone (Fig. 6.6.15).
- At one region at the southwest of the house, one slate slab had the appearance of wicking moisture from their base during a rain event (Fig. 6.6.16). This effect was not apparent on the previous, dry day. As discussed above, there is reason to believe that the bases of the slabs were not waterproofed as originally detailed. The house's drainage system also converges near this location (see Section 6.2).
- Horizontal scratches were noted at the base of several slate slabs. These scratches may relate to the use of Baker scaffolding at the exterior of the building for maintenance purposes.

Marble. Fewer problem conditions were noted at the exterior marble cladding:

- At one location at the north of the house, subtle vertical streaking or staining possibly related to past water leaks at the laylight above.
- At one location at the west of the house, the marble is damaged from two anchor holes where art had been hung.

On the interior, no significant conditions were noted at the marble slabs. Building Conservation Associates observed minor discoloration at the bottom several inches of some slabs, likely due to floor polishing. In addition, the grout and sealant at the perimeter of the slabs are frequently failing (Fig. 6.6.17). There is evidence that the metal clips for picture hanging have caused damage to the tops of some of the slabs (Fig. 6.6.18).

Plaster. Very few conditions were noted at the interior plaster (or its painted finishes) (see Section 6.4 for condition of plaster ceilings).

Paint. Unlike at the exterior, no deteriorating paint or clear evidence of past touch-ups were noted at the interior metal finishes. In general, the interior paint finishes exhibit little deterioration. The paint in the kitchen showed the most soiling and localized wear.

Wallcoverings. Staining from water infiltration was noted on the Master Bedroom fabric covering at the northwest corner of the house (Fig. 6.6.21). It is possible that some of this damage dates to the Millers' occupancy, prompting the search for a matching paper c. 1990. The Powder Room wallpaper is in generally good condition except for heavy soiling around the air vent on the north wall.

Ceramic Tile. Limited deterioration was noted in ceramic tile wall finishes.

Glass Mosaic Tile. The glass tile exhibits no significant deterioration.

Micarta Laminate. The Micarta surfaces exhibit remarkably little deterioration. No discoloration was noted in areas of sun exposure or at areas in the kitchen exposed to heat. The kitchen countertops have many fine scratches consistent with their use as a work surface, as well as a few small locations of chipped edges. Micarta cabinet doors in the laundry room have small areas of damage near the handles. A larger area of loss was noted at the bottom of a partition in the Master Bathroom (Fig. 6.6.24).

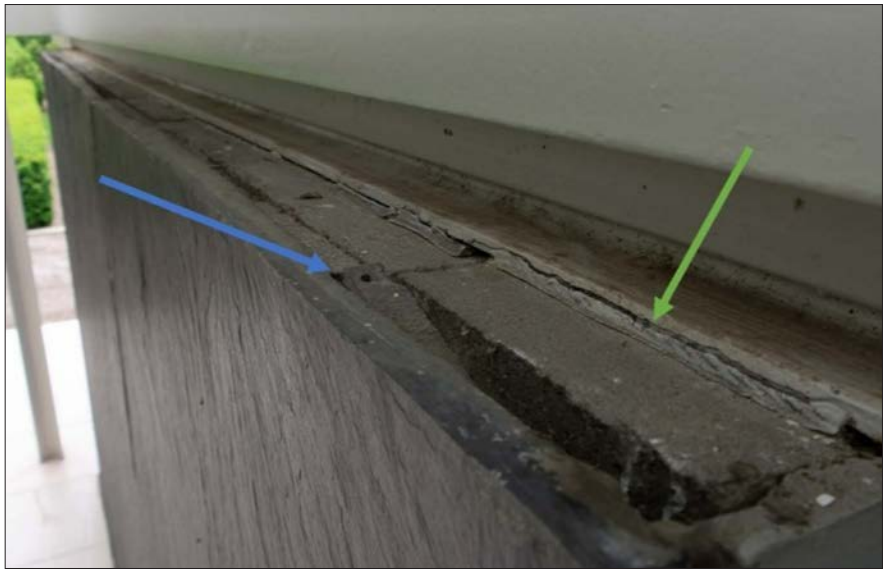


Fig. 6.6.10 Tops of slate slabs showing deteriorated mortar at top joint with CMU backup (blue arrow), typical. Note also deteriorated sealant at joint with metal angle green arrow), typical. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.11 Gap between concrete backup and slate slab in excess of 1". However, note that the joint between the steel angle in the foreground and the slate slab is close to the 3/8" specified in the drawings. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.12 Top of slate slab with joint entirely open. Note the large amount of debris in the cavity. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.13 Gaps in sealant show what appears to be the edge of the terrazzo (arrows), which stops short of the slate. Note also that the divider strip cover clearly stops short of the slate. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.14 Widest of the hairline cracks in the slate. Other cracks appear more associated with natural veining. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.16 Slate at southwest corner of house on dry day (left) and during a rain event (right). Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.15 Apparent staining adjacent to sealant joint in slate, typical. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.17 Failing grout and sealant joints at perimeter of marble slabs. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.18 Small chips at top of slab (arrows) presumably from picture hangers such as those visible at right of photo. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.6.19 Water damage or fading adjacent to return air grille in Powder Room. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.6.20 Wear at metal base, plaster and wallpaper in corridor leading to Power Room, likely caused by housekeeping equipment. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.6.21 Water damage on silk wallcovering in recessed area of Master Bedroom. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.6.22 Typical ceramic tile on bathroom walls. Note cracked grout in corner joint and at counter. Date: June 2021. Photo credit: Scattergood Design

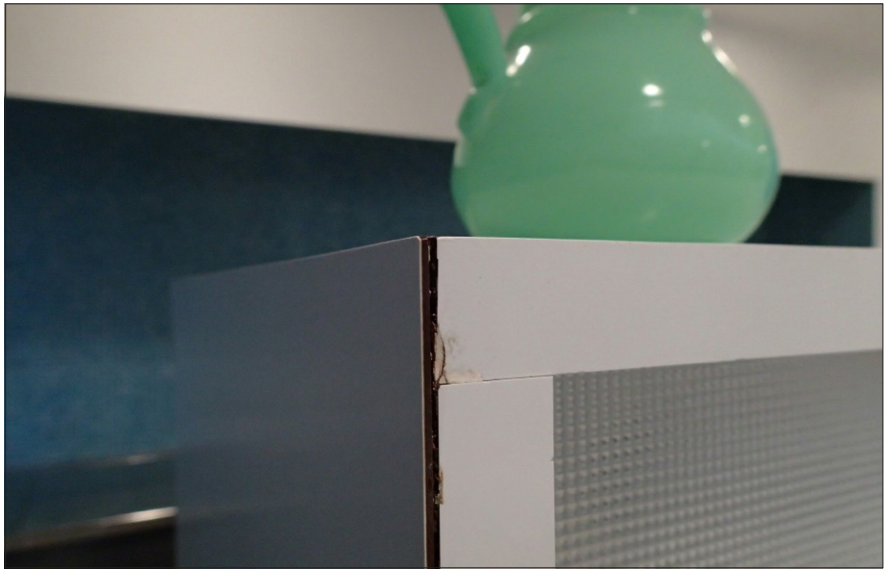


Fig. 6.6.23 Chipped micarta laminate at kitchen storage unit. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.6.24 Largest loss of Micarta noted, at divider in Master Bathroom. Date: June 2021. Photo Credit: Building Conservation Associates

6.7 TRANSPARENT WALL SYSTEMS: DOORS AND WINDOWS

Design and Construction History

Floor-to-ceiling glazing at the Miller House created strong connections between interior and exterior, such an essential element of Modernist design. Dan Kiley noted that: "The sense that the house reaches from its centre out to the land is facilitated by Eero's use of devices such as glass walls and skylights, which allow phenomena of nature (light, shadow, breeze) and the qualities of interior space (volumetric definition) to co-mingle. I seized upon this transparency between interior and exterior space as a starting-point."[82] According to architecture critic David Dillon, Kevin Roche later claimed "the idea of the glass walls came from Girard, who had designed his own house in Grosse Pointe, Michigan, with two garage doors that could be raised to connect inside and outside."[83]

The assemblies include a mixture of fixed windows, casement windows, hinged doors, and sliding doors—all specified to be produced by different manufacturers. However, Saarinen specified that all the aluminum work receive the same "Alumalite [sic] 204" finish.[84] According to a 1952 publication of the National Association of Architectural Metal Manufacturers, Alumilite finishes were proprietary anodization processes.[85] Anodization is the process of artificially producing a thicker version of the protective oxide coating that naturally forms on untreated aluminum. Alumilite 204 was recommended by the Association for exterior applications.

The large exterior openings, critical to the sense of seamless connection to the outside, were specified to be "Glide Duo-Glaze Aluminum Horizontal Sliding units as manufactured by the Glide Window, Inc., North Hollywood, Calif."[86] As noted in Section 3.4, the Glide doors were late to arrive on site.[87]

Aluminum casement windows were specified as "Fomite Aluminum Series No. CPA-2" manufactured by General Bronze Corporation in Garden City, NY.[88] Windows and doors were constructed of ½-inch and 1-inch thick insulating glass, "composed of two pieces of ¼ [inch] polished plate glass hermetically sealed with a metal to glass bond and filled with dehydrated air."[89]

Window Treatments. An integral part of the window system were draperies, which provided privacy, light control and color for the spaces. For some openings, there were two sets of treatment: "light weight and sheer casement drapery," called "Glass Curtains"; and the heavier "Curtains." Separating the Living Room from the Dining Room to the north and the Den to the south were "Divider Curtains."[90] All fabrics were selected by Alexander Girard, often from his own fabric designs. The Newfields Archives contain what appears to be a fairly complete listing of the window treatments in various spaces, including fabric swatches and notes on replacement.[91] See also Section 8 for descriptions of Girard's Color Scheme and individual rooms.

The draperies were hung from track recessed in the ceiling, indicated on the original reflected ceiling plans. In some spaces, curtains were deployed and retracted by electric motors.

Newfields Archives has prepared summaries of treatments for curtains and the drapery motors, documenting frequent wear, repair and replacement.[92] These issues would be expected for the textiles, which are adversely affected by exposure to UV light and light in general. For commercial installations, it would have been typical to order quantities of replacement fabric, recognizing that dye lots may vary and patterns may go out of production. In fact, as early as 1958, correspondence noted: "Both Mr. and Mrs. Miller feel that any small places can be repaired, and, at such time as they should 'wear out', they would probably be ready for a change, and, therefore, do not want any replacement fabric made up."[93] Replacement appears to have occurred about every ten years.[94]

The draperies were typically designed to retract to one side, rather than the center, so that they nested along opaque sections of the wall. Thus, the height and length of window openings in the House meant that the sections of window treatment were quite heavy. Correspondence in 1957 centered around the need for heavier-duty drapery motors than were currently in production. Subsequent correspondence indicates that the motorized operation was problematic from the start.[95]

The glass door panel at the Living Room was cracked by heat build-up due to adjacent lighting. UV filtering film was applied to all windows in 2010.[96]

Existing Conditions

Insulated glazing units are generally in excellent condition considering their age, however the team could not evaluate the performance of the perimeter seals in the insulated glazing units. Over time, these seals will degrade, allowing moisture vapor to enter the cavity and form condensation on the interior face of the exterior panel during winter. The ultraviolet (UV)-filtering performance of the film applied to the glass in 2010 was not checked. UV-filtering film performance varies by composition and manufacturer. The films can lose effectiveness in 10 to 15 years and should be checked annually and replaced as part of a preventive conservation program.

All aluminum at the Miller House is relatively protected from rain by the House's deep soffits. Typical of architectural aluminum not subjected to extreme conditions, the metal itself exhibits negligible deterioration. Small white deposits represent localized accumulation of aluminum oxides, but this surface buildup is not indicative of substrate deterioration (Fig. 6.7.2). As discussed above, the same aluminum oxides typically form a self-limiting clear protective coating. No pitting or other substrate deterioration was noted, except at the door thresholds. The

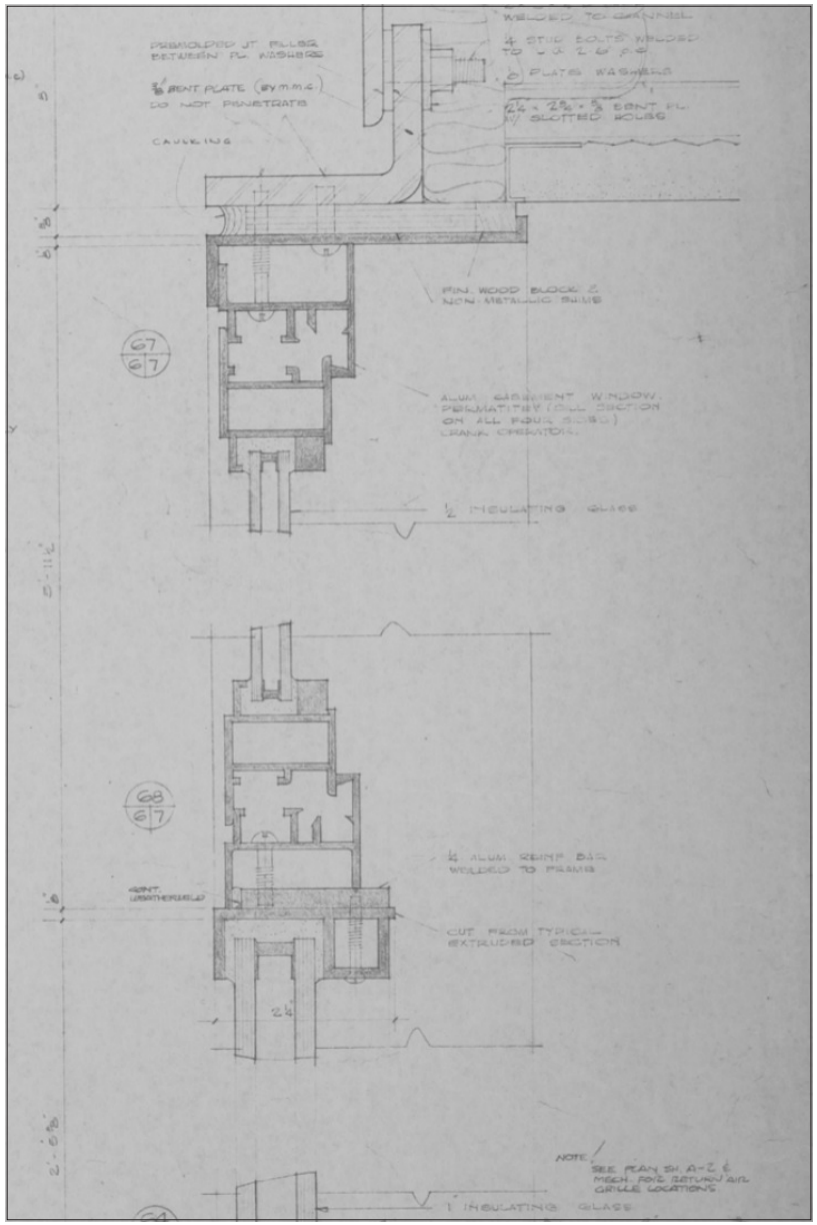


Fig. 6.7.1 Sliding window details from sheet A-7. Date: February 18, 1955. Photo credit: MHG_Ia_B001_f007_025-101, Miller House and Garden Collection (M003), Newfields Archives

aluminum thresholds were typically pitted, possibly due to deicing salts or possibly due to water's collecting on the surface (Fig. 6.7.3).

Some of the glazing units appear to have been replaced; sealant at the perimeter of the remaining original glazing units was generally failing (Fig. 6.7.4). The team did not evaluate the window and door assemblies for operability or condition of the weather-seals between the operable elements and the fixed frame/track.

In contrast to the exterior faces of the aluminum window and door assemblies, the interior faces typically exhibit negligible white surface corrosion deposits. The exception is the sliding doors at the west of the house, which do have such deposits. As at the exterior, the most significant condition is deteriorated sealant throughout the assemblies.

Condition of window treatments was not in the scope of the assessment.

Fig. 6.7.2 Small white deposits of surface corrosion at aluminum window frame, typical. Note also the deteriorated sealant at arrow. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.7.3 Pitted aluminum threshold, typical. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.7.4 Sealant at all points in the glazing assemblies was typically failing. Date: June 2021. Photo credit: Building Conservation Associates

6.8 STORAGE SYSTEMS

Design and Construction History

"Plentiful storage promotes order" exclaimed a section heading in the 1959 *House and Garden* article on the Miller House.[97] "Periodic drives to pick up and put away are never called for when you have storage facilities as uncommonly generous and well-thought-out as these."[98] Equally significant is the way in which storage facilities were integrated seamlessly into the architectural framework.

Linear storage units had been developed by George Nelson for Herman Miller for use in home, office and retail environments. They were featured in Nelson's 1945 book, *Tomorrow's House: A Complete Guide for the Home-Builder* and featured in an exhibit organized by Girard at the Detroit Institute of Fine Arts in 1949 titled "An Exhibition for Modern Living."[99] Girard had made a similar feature wall in his own home; it was an assemblage of wood scraps and masks from different sculptures.[100]

Living Room. As further demonstration of the importance placed on storage, the Storage Wall in the Living Room was featured on the cover of the 1959 *House and Garden* issue and again in a full spread that captured every detail. Like the cushions in the Conversation Pit, the 50-foot storage unit that spanned the south wall of the living area infused the white interior with color and texture. Saarinen noted that collections "assume significance and strength in the impersonal, noncommittal setting. They stand out like oases in the desert. They express the personality and establish the identity of the owners."[101]

The Storage Wall was constructed of Brazilian rosewood-veneered plywood with a variety of wall coverings—paper, fabric, and gold leaf—along the back wall (Fig. 6.8.1). As in other parts of the House, wall coverings were selected by XSM in consultation with Girard. Correspondence between Girard's office and XSM in 1963 indicates that grey, gold, green, red, and Japanese handblocked papers were being shipped to the Millers; the files include fabric samples of the same papers still on display within the storage wall.[102] The memo does not indicate the provenance of the papers, but other correspondence refers to the Kneedler Fauchère company, based in San Francisco.[103]

TV Room/Den. The veneer of the TV cabinet appears similar to, but slightly distinct from, the other storage wall veneer, possibly indicating an alteration. However, the original drawings do depict folding cabinet doors at this location. Veneered plywood was also used for other built-in furniture throughout the house. The specifications call for veneered plywood to be faced with benge (Jubouri arnoldiana),[104] a West African genus also known as mutenye, though the veneer does not appear to be consistent throughout the house. Perhaps some of the veneer is rosewood, and some of it benge.

Master Bedroom. *House and Garden* described the Master Bedroom fireplace wall as "an attractive hiding place for personal possessions… [and] an ideal surface for a collection of family mementos, old prints, paintings and other small decorative accessories."[105] It consists of panels or doors of perforated aluminum lattice set in steel angles and painted white, with concealed piano hinges (Fig. 6.8.4). This was supplemented by wood-veneered units in the individual dressing rooms and luggage closet (Fig. 6.8.5).

Children's Playroom. The *House and Garden* article remarked on the decision to make the children's rooms relatively small. Clustered around a central playroom, this was a legacy of Saarinen's childhood in Scandinavia. *House and Garden* assured its readers that "although …the central playroom [is] common property, each child has plenty of room for personal belongings, a bulletin board and a well-lighted desk."[106] This space was renovated in 1972–73 and is now known as "Mrs. Miller's Office."

Kitchen. *House and Garden* remarked on the way that kitchen "walls [were] freed from the usual hanging cabinets."[107] Cupboards were located below counters and storage above counter height limited to a single open shelf suspended above the island. Kitchen supplies and equipment were hidden in closets (Figs. 6.8.6 and 6.8.7).

Prior Treatments

Not currently known.

Existing Conditions

Living Room Storage Wall. Staining from water infiltration was noted on several of the wallpapers at the south end of the Storage Wall. Upon close inspection, minor wear was also noted in the vicinity of cabinet handles of the Storage Wall (Fig. 6.8.8).

Storage Units. Few problems with wood veneer were noted. In isolated regions, the veneer has small loss or has become loose. The veneer in the vicinity of the cabinet handles in the walk-in closets is heavily scratched (Fig. 6.8.9). The areas around the wire pull handles in many locations exhibit grease staining and scratching, likely associated with harsh or over-zealous cleaning (Fig. 6.8.10). Isolated scratches were also noted on the wood inside the Powder Room.

6.9 SCREEN WALLS: PRIVACY, ANTICIPATION, AND CURATED VIEWS

Design and Construction History

The underlying module and structural grid naturally generated axes and directed views. However, in contrast to traditional or Beaux-Arts planning, the procession from the site to the interior and back was rarely obvious or linear. Kiley noted: "The house/landscape construct is more about a flow of articulated space than about reaching a static destination."[108] During an interview years after the house was built, Saarinen declared:

> I think maybe one of the things which has been lacking in our day is how is a building perceived. … You come to a building in a certain way. You enter a door. You grasp a door handle. You see the frame of the door. You come into a space. You don't know what is going to happen beyond it. You come into a dark space and then it opens up into a light space. … We're not the master of that in our modern architecture.
>
> For instance, I always remember one traditional, awful French house north of Chicago where this was marvelously done. The series of things that happened to you, the surprises, the development from one space to another space. Modern architecture is something that you come in, you can practically see the inside from the outside, and there's no surprise. Then you have to evaluate: How important is it really toward the total? How much has been forgotten?[109]

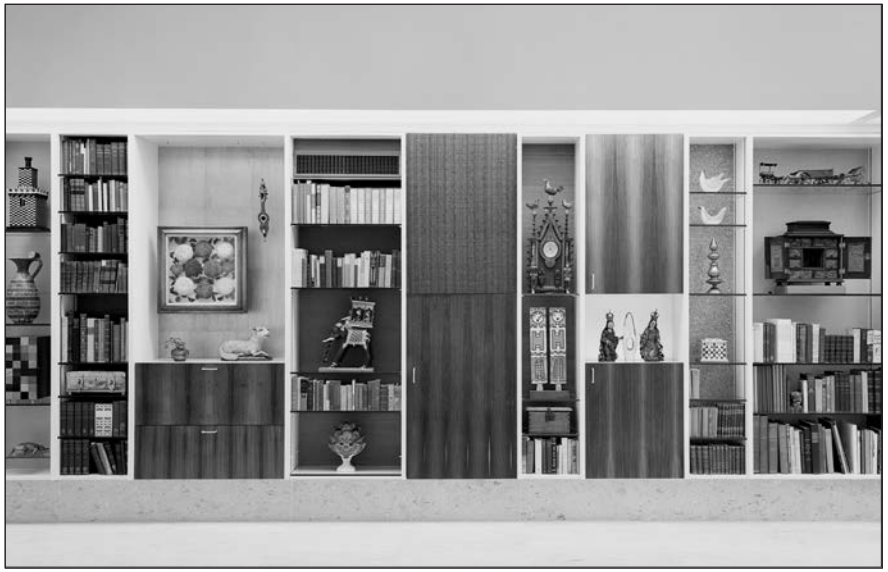


Fig. 6.8.1 Living area storage wall. Date: 1958. Photo credit: © Ezra Stoller / Esto 00031470

Fig. 6.8.3 Detail of north end of living area storage units. Date: 1958. Photo credit: © Ezra Stoller / Esto 00031471

Fig. 6.8.2 View of living area storage wall from terrace. Date: 1953-57. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00359.

Fig. 6.8.4 Storage wall, Master Bedroom, 1958 and 2019. Date: as noted. Photo credit: © Ezra Stoller / Esto 00031431 (Left) and Michael C. Henry (Right)

Fig. 6.8.5 Storage Wall, Master Dressing Room 1958 and 2010. Date: as noted. Photo credit: © Ezra Stoller / Esto 00031428 (Left) and Michael C. Henry (Right)

Fig. 6.8.7 View of Kitchen. Date: 2019. Photo credit: Michael C. Henry

Fig. 6.8.6 "Floating" shelves in kitchen. Date: 1958. Photo credit: © Ezra Stoller / Esto 00031461

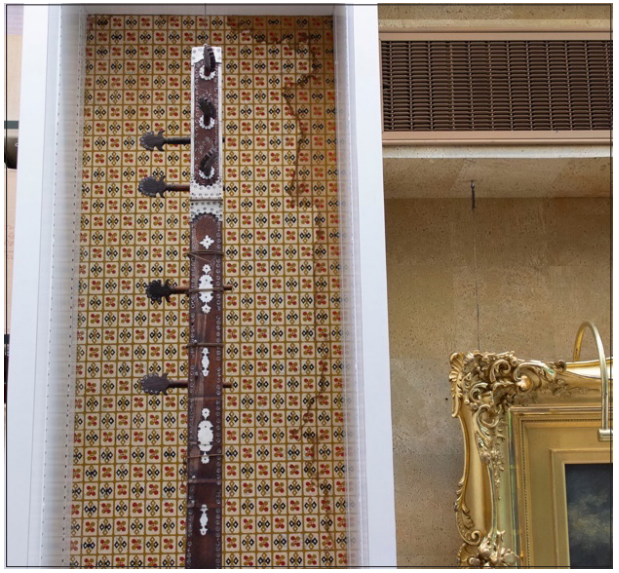


Fig. 6.8.8 Water damage to wallpaper in the Storage Wall. Date: June 2021. Photo credit: Building Conservation Associates

Fig. 6.8.9 Chipped paint on wire pulls and scratched adjacent wood veneer (likely as a result of cleaning) is a fairly typical condition, especially in the Kitchen. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.8.11 Gouged wood on lower corner of storage unit, likely caused by vacuum attachments or power cords. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.8.10 Scratched veneer adjacent to wire pulls in Dressing Room. Date: June 2021 . Photo credit: Building Conservation Associates

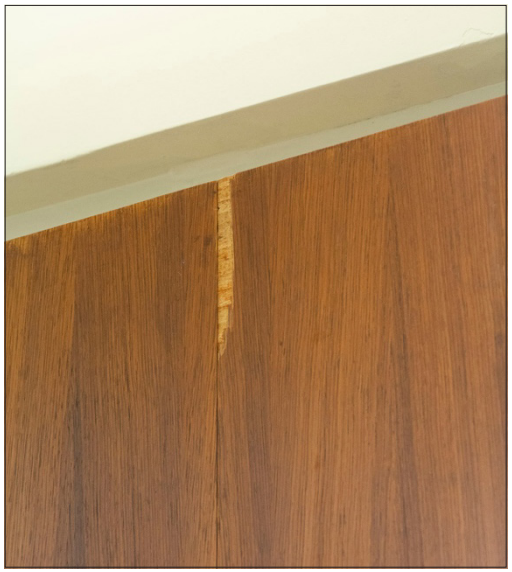


Fig. 6.8.12 Largest area of lost veneer, possibly caused by contact with adjacent steel when opened. Date: June 2021. Photo credit: Building Conservation Associates

The Miller House entry drive offers a series of open and closed views, terminating with an obscure glass screen (these and other screens within the landscape are discussed in Section 7.10). As noted above, the four principal connections between inside and outside (Entry, Dining, Living, TV/Den) are recessed, only visible when directly facing them. A blank wall is located directly opposite the entry, and a narrow screen beside the fireplace obstructs the view of the central space until the visitor is well inside. The former served as a backdrop for an elaborate console table; on the latter hung *La carafe* by Pablo Picasso, which the Millers acquired in 1962.

Prior Treatments

None documented.

Existing Conditions

Generally in good condition.

Fig. 6.9.1 View from main entrance. Date: 1953-57. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00348.

6.10 CONVERSATION PIT OR "LOUNGE PIT"

Design and Construction History

The 15' square Conversation Pit, also called the "Lounge Pit," is located opposite the entrance, set below the level of the floor. Precursors can be found in earlier projects by both Girard and Saarinen. A Z-shaped assembly of couches subdivides Girard's living room in Grosse Point, designed in 1949 and photographed for *House Beautiful* in 1953, and the Edelman Residence designed in 1949, which Girard designed with Minoru Yamasaki, had a seating area called the "Cave."[110] Case Study House #9, The Entenza House, designed in collaboration by Saarinen and Charles Eames in 1949, featured a sitting area framed by an L-shaped banquet is set two risers below the main floor level.[111]

House and Garden proclaimed of the Miller House's Conversation Pit: "The unsightly tangles of chair and sofa legs, the ubiquitous end tables, the traffic barrier are all missing."[112] It also gave the space flexibility, comfortable for corporate or civic events as well as intimate family gatherings. Unlike most innovative aspects of the design, this was not immediately embraced by the Millers. After the final scheme was presented, Saarinen confided to Girard:

> Zenia [sic] is skeptical about the steps in the living room. She would like the floor all on one level... Her argument—maintenance and danger with guests falling. My argument—boy! we had a three story building full of steps—we have eliminated all but three measley [sic] steps, etc. etc. I think she will learn to like them—but one never knows.[113]

JIM confirmed this a week later, as he wrote, "Xenia is still skeptical about the steps down into the living room, and I agree that these may appear formidable to older ladies."[114] However, the designers prevailed. According to JIM, the deciding factor seems to have been a mockup: "'We constructed a model of it at a shop in New York. We sat in it and asked ladies in the shop to walk by, to see if their skirts exposed too much.'"[115]

Called the "Conversation Center" in *House and Garden*, this feature was considered by many to be the "the absolute centrepiece of the house [and] descending into a dedicated space for conversation added a whole new dimension to the interaction with guests, both physically and socially."[116]

When XSM and JIM had shared ideas about their dream house in correspondence during World War II, she emphasized that "The thing which I want

above everything else...is very beautiful, clear colors in the rugs, draperies, furniture, etc. No dark or drab tones for me."[117] JIM considered the conversation pit and the interiors to be "'very much influenced by Sandro [Girard's nickname],'" whose selections of fabrics and colors transformed the interior and allowed it to be actively modified.[118] The pillows, cushion covers and the carpet in the Conversation Pit were designed to be changed with the seasons (Figs. 6.10.1 and 6.10.2). After the renovation in the 1990s, the old cushion covers no longer fit the new cushions, but the pillows are still seasonally rotated.[119]

The floor of the Conversation Pit was set 2 feet, 3 inches below the main floor level. A shallow terrazzo curb, similar to that at the edge of the fireplace, forms the outer edge. Five steps of padouk, a tropical wood, rest on the curb and steel stringers, giving the appearance of floating in air. Strips of black rubber set into the wood provide a non-slip surface.

Prior Treatments

Originally, the edge of the seats was just 7 inches above the level of the pit and they sloped steeply back, providing great comfort while seated but making the transition from seated to standing a challenge for people of all ages. In April of 1994, Miller wrote to Kevin Roche: "'Neither we (at our advanced ages) nor our friends feel safe in going down to the pit nor in exiting there from, so we don't use it. What can you do?'"[120]

Over the next year, Kevin Roche John Dinkeloo and Associates prepared a series of studies. They considered eliminating the backward angle of the seats and raising the height of both the lower floor and the seating to provide 14 inches between the floor and the edge of the seat. A handrail for the stairs was also studied. The latter was installed, but the seating was only modified with thicker back and seat cushions.[121]

The handrail was removed after Newfields acquired the property. The thicker cushions remain in place.

Existing Conditions

Good. See notes regarding curb under Travertine (see Section 6.2).

Fig. 6.10.1 Conversation Pit with warm "winter" upholstery scheme. Date: 1953-57. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00356.

Fig. 6.10.2 Conversation Pit with neutral "summer" upholstery scheme. Date: 1953-57. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00361.

6.11 LIVING AREA FIREPLACE

Design and Construction History

The freestanding fireplace is a focal point of the living room, immediately visible from the entrance, yet one of the last elements to be finalized. Girard wrote to JIM and XSM on August 30, 1956: "The only thing of major importance that is not yet determined is, of course, the living room fireplace. All the time that can be spared in arriving at a really desirable solution I feel is required."[122] He told the Millers that Roche was "still working on it."[123] In October 1956, a sketch was in the hands of the metal working firm for a quote, but the sketch in the Archives was not issued until December 10, 1956.[124]

The fireplace is attributed to Balthazar Korab, who had joined Saarinen's office in 1955 and was "first tasked with designing and modeling multiple proposals for the sculptural fireplace that was to punctuate the main living area in the center of the house and screen the front door from the conversation pit, a circular dining table and a built-in storage wall."[125] JIM claimed Korab had made 11 designs that were rejected; Korab's own archives include a photo of nine versions.[126]

The final design was relatively simple, oval in section. Suspended from the ceiling, it inverts the usual expectations for a hearth as solid, weighty, and grounding.

Prior Treatments

None documented.

Existing Conditions

The travertine curb is cracked adjacent to the steel retainer for the fireplace screen, and there has been minor loss of stone (Fig. 6.11.2).

Fig. 6.11.1 Fireplace. Date: 2019. Photo credit: Michael Henry.

Fig. 6.11.2 Cracking and loss at edge of fireplace hearth. Date: June 2021. Photo credit: Scattergood Design

6.12 CARPORT

Design and Construction History

House and Garden noted, "There is little denying that [at the Miller House,] the real front door is the carport... The carport is part of the home."[127] While in many post-war suburban homes, the carport was indeed a structure distinct from the house, at the Miller House, it is part of one of the service "blocks." A steel accordion screen secured the automobiles, though most views of the House showed the screen compacted and the Millers' automobiles on display (Figs. 8.12.1 and 8.12.2). The *House and Garden* article further noted that the space "becomes children's play area on rainy days."[128]

Prior Treatments

None documented.

Existing Conditions

Floor, wall and ceiling finishes appear to be in good condition, with the exception of areas of staining on the terrazzo.

Two temporary openings covered with thin sheet metal painted white were installed to give access to the area between the ceiling and roof in 2021.

Fig. 6.12.1 Carport. Date: 1958. Photo credit: © Ezra Stoller / Esto 00116406

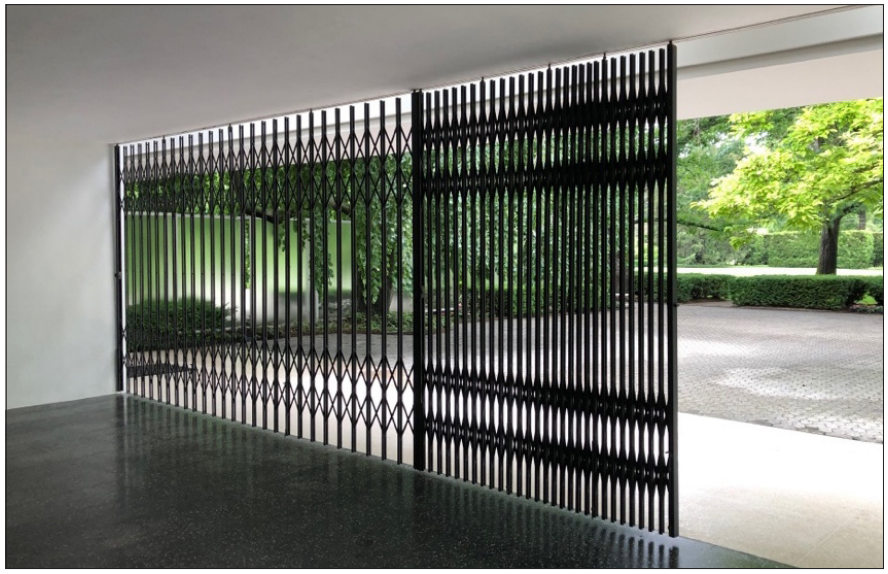


Fig. 6.12.2 Screen at Carport. Date: June 2021. Photo credit: Scattergood Design

6.13 HEATING, VENTILATION, AND AIR CONDITIONING SYSTEMS

> What will be the biggest problem when we build a house? Wouldn't it be heating and cooling...in this climate? Next in importance to me would be its simplicity and how easily kept clean the place was. I want smooth, light furniture. ... How about coils in the floor—isn't that the way one room in the church is heated? That's the most sensible place for the heat to come from, it's always coldest on the floor and heat rises.
>
> Xenia Simons Miller[129]

The heating, ventilating, and air conditioning (HVAC) system for managing the interior environment of the Miller House is a character-defining element of the Miller House in that its design and operation reflect the sophisticated and technologically-informed expectations of the Millers and the technological sophistication of the House itself. The character-defining aspect of the HVAC system is not expressed in the form of technological artifacts such as a boiler, but by the approach to, and execution of, its design.

Performance of the HVAC system in managing the interior environment of the Miller House is discussed in 6.14.

Design and Construction History

Based on the original mechanical drawings M-1 and M-2, the original HVAC system consisted of:[130]

- Gas-fired hot water boiler. Combustion air for the boiler was provided by an 18-inch diameter tile duct from a subgrade vault north of the Kitchen. The boiler exhausted to the rooftop through an insulated, steel-lined masonry chimney venting at the roof after passing through the southwest corner of the Laundry Room.
- Municipal water, treated by a Culligan water softener in the basement, was supplied to the boiler.
- Trane 2-15 "Climate Changer" dual-fan air handling unit with hot and cold decks. Outside air for ventilation was provided through a 33-inch diameter vitrified tile duct from a subgrade vault north of the Kitchen.[131]
- Westinghouse Electric PC-37 "Precipitron" electrostatic air filter and power supply and integral sprays for hot water self-cleaning and for adhesive application.[132]
- Air conditioning compressor and water-cooled condenser in the basement. Water from a well in the subgrade vault north of the Kitchen and stored in a 3000-gallon water tank adjacent to the vault was used for once-through cooling of the condenser, then discharged into a drain.[133]
- Five zones of heated and cooled air distributed through under-slab supply air ducts and return air ducts ranging from 8 to 18 inches in diameter (Fig. 6.13.1). The ducts are vitrified tile in straight runs and steel sheet metal ducts at changes in direction. Both are cast in lightweight aggregate concrete with a "heavy duplex paper vapor retarder" at the concrete/soil interface. From the main ducts, supply air is discharged through steel sheet metal ducts terminating in high wall vents. Return air inlets are located in floor grilles at window and at ceiling intakes, high/low wall intakes at other locations.
- Four zones of radiant floor heating. The ¾-inch diameter iron hot water heating pipes are set at the bottom of a three-inch thick finish floor slab which was cast on a six-inch thick concrete base slab. The rough and finish slab edges are thermally insulated with one-inch thick fiberglass insulation at the perimeter.[134]
- Thermostatic control system by Minneapolis-Honeywell Regulator Company for the conditioned air system and the radiant floor heating system.

The technical sophistication of the system was consistent with the structural and architectural sophistication of the House. An oil-fired boiler would have been typical for a residence, but Saarinen's office noted that a gas-fired boiler would require a lower chimney height and would have cleaner exhaust, an important consideration with the skylights.[135]

Post-construction, JIM raised questions regarding adjustments or changes to the heating and cooling system, the most recent being an inquiry from Owen Hungerford concerning the addition of radiant ceiling heat in the toilet room of the Master Bathroom.[136]

Prior Treatments

1967	Two Armstrong Model YH "Humidimaker" humidifiers added to main air handling unit with water supplied by existing boiler.[137]
1967	Humidification control added to the thermostatic controls by Minneapolis-Honeywell Regulator Co.[138]
1994-1997	"Hydrotherm" three module 750,000 BTU/hour gas-fired boiler replaced the original boiler.[139]
Unknown	"Puritan" water treatment system replaced the original Culligan water treatment system.[140]
1999	Trane 20-ton cooling capacity chilled water unit replaced previous unit water-cooled condenser.[141] This was presumably accompanied by the installation of the five-cell modular air-cooler for condenser water unit along the parking lot west of the barn.
2009	Five air handling units and associated ductwork replaced the original multi-zone air handling unit in the Basement. Five Aprilaire Series 700 evaporative humidifiers replaced the 1967 humidifiers.[142]
Date not available	New digital HVAC control system installed by Intelli-Building.[143]
May 2011	Interior environmental monitoring program initiated with datalogger in the Living Room (piano). Data uploaded to *eClimateNotebook*.[144]

Existing Conditions

The existing HVAC system is generally consistent with the design intent of the original system and consists of the equipment replacements installed from 1994 until the present. As currently configured, the HVAC system is capable of heating, cooling, filtration, humidification, and dehumidification.

Based on observation of the existing system, screenshots of the HVAC control system, and review of monitoring data from the living room on *eClimateNotebook*, there are several areas of potential concern:

- The gas-fired hot water boiler (c. 1994) is approaching the end of its service life and will need replacement. The replacement gas-fired boiler will be much more efficient. The exhaust gas temperatures will be lower than those of the existing boiler and will possibly result in problems with draft through the chimney and acidic condensation. Venting of the cooler flue gases may require modifications to the chimney and should be evaluated as part of the boiler replacement.
- The dampers controlling the entry of outside (ventilation) air have corroded and may not fully close when needed. They should be replaced with dampers equipped with tight-sealing blades.
- The control system does not monitor and display the operating status and key measurements of the condenser water portion of the system (the pumps and water loop to the condenser water air-cooler). This information is critical to monitoring the cooling system performance, especially the chilled water unit since the function of the condenser water loop is to remove and reject heat from the condenser.
- The control system does not monitor and display the operating status and key measurements of the floor heating system. The functionality and leak integrity of the floor heating piping is unknown.
- The "sequence of operations" of the present control system was not available for review. The control logic for the five Aprilaire humidifiers is of particular interest since the output of the humidifiers must be limited in winter to avoid damaging condensation in the building envelope.
- The condition and cleanliness of the under-slab clay tile ducts and sheet metal ducts is unknown, but debris and a corroded damper are visible in the return air duct at the west sliding door of the living room. The sheet metal portions of the ducts may have corroded due to moisture. All under-slab ducts should be cleaned and then assessed with borescopic video.
- The condition, water-tightness and functionality of the hot water piping embedded in the floor slab is not known.
- The subgrade vault north of the Kitchen could be a point of water entry to the basement through the air intakes in a major flood event. Emergency planning should address this possibility.

6.14 INTERIOR ENVIRONMENTAL MANAGEMENT AND HYGROTHERMAL PERFORMANCE OF THE BUILDING ENVELOPE

Interior environmental management and hygrothermal performance of the building envelope are not character-defining elements, but each plays a significant role in the longevity of character-defining elements, including architectural fabric and contents of the building.

The building envelope moderates the effects of thermal energy, moisture, and wind on the building interior. The Miller House building envelope includes the roof, skylights, soffits, eaves, carport ceiling, exterior walls, windows, and doors with approximately 18,820 square feet of exterior surface area. The roof, skylights, soffits, eaves and carport ceiling comprise 83% of the total exterior surface area and the walls, windows and doors comprise the remaining 17% of exterior surface area.[145] As noted in Section 6.13, the HVAC system for interior environmental management at the Miller House was sophisticated in design, execution, and attention to its operation for the thermal comfort of its owners and occupants.

As an interpreted, architecturally significant mid-twentieth-century residence with many of its original furnishings, books, paper, paintings, metals, wood and textiles as museum collections, the priority for interior environmental management shifts from human thermal comfort to slowing the rate of deterioration of the collections and the architectural fabric, especially the building envelope that separates the interior from the exterior. Preventive conservation of collections materials generally prioritizes stability and avoidance of extremes in relative humidity (temperature is less critical). Preventive conservation of the architectural fabric of the building envelope prioritizes managing the gradient between interior and exterior conditions of moisture and temperature.

The environmental criteria for collections conservation and building envelope conservation can be at odds, and conservators of cultural heritage have resolved this dilemma with guidance in two important documents. Philosophical guidance is provided by the *New Orleans Charter for the Joint Preservation of Historic Structures and Artifacts* (1992) and technical guidance is provided by Chapter 24: "Museums, Galleries, Archives, and Libraries" of the 2019 *ASHRAE Handbook—Heating, Ventilating and Air-Conditioning Applications*.[146]

ASHRAE Chapter 24 classifies environmental performance in buildings containing collections and indicates the comparative level of collections risks and benefits associated with each class of environmental control. This chapter also provides a method by which realistically achievable class of environmental control for a given building can be determined based on the climate zone and the performance characteristics of the building envelope.[147]

A detailed evaluation of the interior environmental management at the Miller House is outside the scope of this Conservation Management Plan, but since many of the character-defining elements of the Miller House are also functional components of the building envelope, it is appropriate to address potential concerns regarding interior environmental management and envelope performance and preservation.

Compared to the present, analysis of building envelopes was primitive in the mid-twentieth century. For residential buildings, design typically focused on thermal energy considerations rather than combined flows of thermal energy and moisture vapor. In the mid-1950s, the environmental movement had not yet reached America's conscience for stewardship and efficient use of resources and energy. Fossil fuels were low in cost and electric power utilities were heavily promoting use of electric power with the cartoon character "Reddy Kilowatt."

Eero Saarinen was aware of the issues of building envelope performance and moisture problems because in 1942 and 1943, Eliel Saarinen had replaced the single glazed windows of the Cranbrook Library with Thermopane insulating glass units to prevent condensation on the glass.[148] By the mid-1950s, this was probably a standard part of his designs for cold winter climates, including the windows and sliding doors of the Miller House.

The main elements of the building envelope of the Miller House are:

- Floor slabs on grade;
- Exterior walls;
- Doors, windows and glazing; and,
- Roof assembly consisting of roof deck and membrane, skylights, skylight cavities, ceiling-roof cavities and overhanging eaves.

Floor Slab on Grade

The six-inch thick reinforced concrete floor slab is separated from a six-inch thick gravel base by a vapor retarder. If the vapor barrier was carefully installed and if seams and penetrations for plumbing, electrical or heating systems were carefully sealed, the vapor barrier is likely to be effective in limiting soil moisture vapor uptake by the floor assembly.

The floor slab is not thermally insulated and extends under the exterior walls to the perimeter plinth. There is no thermal break between the interior and exterior portions of the slab and the exterior portion of the slab is not insulated. Under exterior walls, the slab is supported by a three-foot deep stem wall; at some exterior wall locations, such as windows and sliding doors, the stem wall incorporates a slender chamber and a narrow slot in the slab which connect to the vitrified tile return air duct of the HVAC system. At the outer edge of the plinth, the slab turns down, extending three feet where it terminates in the soil (Fig. 6.14.1).

The heat loss through the floor slab to the exterior plinth in winter was designed to be offset by the interior topping slab which was heated with embedded hot-water piping. If the floor heating system is not utilized, the warm air heating system is unlikely to offset cold thermal bridging through the slab at exterior walls. The temperature of the floor near the exterior walls is likely to be lower than room temperature in winter.

The potential consequences of not heating the floor in winter, such as condensation of humidified interior air near exterior walls, should be evaluated.

Exterior Walls

The exterior masonry wall assembly (Figure 6.14.2) typically consists of:

- 1¼-inch thick slate or marble cladding;
- 3/8-inch thick mortar setting bed (displacement of the stone panel may have results in a void);
- 4-inch thick concrete block;
- 2-inch thick blanket insulation with reflective vapor barrier on the interior face, or 2-inch-thick framing lumber;
- 3/8-inch gypsum lath;
- 3/8-inch plaster; and,
- Oil-based interior paint, possibly several layers.

The exterior masonry wall assembly at the east side of the Carport forms the Living Room Storage Wall and consists of:

- Exterior paint;
- 1-inch thick cement plaster;
- 4-inch concrete block;
- 2-inch thick blanket insulation, presumably with reflective vapor barrier on the interior face, or 2-inch-thick framing lumber.

Detail A of Drawing A-13 does not show an interior wall finish system between the insulation and the back of the Living Room storage units.[149] The interior side of the north and south walls of the carport have conventional gypsum lath and painted plaster finishes (the enclosure wall on the south side of the carport is at the back of the closets).

The placement of the vapor barrier in the sequence of the wall materials is correct for this climate zone. The effectiveness of the vapor barrier will depend on whether the barrier seams and penetrations for plumbing, electrical or heating systems were carefully sealed.

The thickness of the exterior wall assembly, and therefore, its hygrothermal performance varies with location. For example, at an exterior corner, the effective wall thickness is 30% less than the full wall thickness to accommodate the inset exterior corner and wood replaces the thermal insulation (Fig. 6.13.2). Heat loss will be increased through the corner, and as a result, the temperature of the interior surface of the finished wall will be cooler than adjoining areas. This may lead to formation of condensation on the face of the vapor retarder.

The hygrothermal performance of the exterior wall assemblies should be evaluated especially with respect to the potential for condensation at “cold spots” such as corners.

Doors, Windows, and Glazing

The sliding doors, fixed windows, and casement windows consist of double-glazed insulated glazing units set in extruded aluminum frames. Swinging doors consist of extruded aluminum frames with single glazing,

presumably due concerns for glass weight and rigidity of the frame.

The framing system for the windows and doors does not provide thermal separation of the interior and exterior components (6.14.3). Thermal bridging through the frames may result in condensation of the interior surfaces when exterior temperatures are very low.

Roof Assembly and Skylights

As noted previously, the roof, skylights, soffits, eaves, and carport ceiling comprise 83% of the total exterior surface of the Miller House, and there are several areas of concern regarding the hygrothermal performance of the roof assembly. These concerns are based on the following factors:

- The steel roof frame is exposed to the exterior air at the fascia beams, soffits, and columns of the extended eaves. The steel roof frame extends directly exterior to the interior without thermal breaks or thermal isolation between members.
- The roof ceiling and roof/soffit cavities are vented to the exterior air by turbine vents.
- There may be air and vapor migration between roof /ceiling cavities and roof/soffit cavities.
- The aluminum skylight frame and the steel roof curb lack thermal breaks or insulation.
- The skylights have single thickness glazing.
- There is air and vapor migration between interior spaces and the skylight cavities.

If the temperature of a surface of the roof assembly falls below the dew point temperature of the surrounding air, condensation will result on impermeable surfaces such as metals and glass and high moisture content will result in porous materials such as plaster and wood. The uninterrupted thermal conductivity of the steel roof frame and the intentional humidification of the house in 2018 can result in condensation of interior moisture vapor on cold concealed surfaces within roof and skylight cavities.

Condensation on metals will result in accelerated corrosion and high moisture content of porous materials will lead to disaggregation of plasters and biodeterioration of wood.

Interior environmental monitoring data collected by Newfields and posted to *eClimateNotebook* (eCN) indicate that the dew point temperature inside the Miller House was maintained at a higher level in winter 2020 than during winter 2019. The interior dew point temperatures are sufficiently high that moisture vapor is migrating from the interior into concealed cavities above the ceiling and the exterior temperatures are sufficiently low that the steel in the roof assembly likely experiences condensation.

Comparison of Exterior Temperature and Interior Conditions at Piano

Date	Statistic	Exterior Temperature	Interior Temperature	Interior Dew Point	Interior RH
01 December 2018 to 31 March 2019	Average	34.4 °F	71 °F	37.3 °F	30%RH
	Minimum	-4 °F	68.3°F	17.3 °F	13%RH
	Maximum	69.8 °F	76.8 °F	51.1 °F	49%RH
01 December 2019 to 31 March 2020	Average	38.6 °F	68.8°F	53 °F	57%RH
	Minimum	6.8 °F	64.9 °F	51.1 °F	50%RH
	Maximum	75.2 °F	74.1 °F	63.2 °F	72%RH

Potential ASHRAE Chapter 24 Class of Control for the Miller House

The monitoring data for 2015 to 2021 at the piano in the Living Room permits a rough estimation of current interior environmental performance (Fig. 6.14.4):

- During summer 2018, the HVAC system controlled relative humidity (53 ± 4%RH) and temperature (71.1 ± 4°F) within ASHRAE Class A1 limits (±5%RH, ±4°F), but performance during other summers have been less consistent.
- During spring and fall of all years, conditions approximated ASHRAE Class B/C.
- During winter of all years, interior conditions approximated ASHRAE Class D due to the low relative humidity extremes.

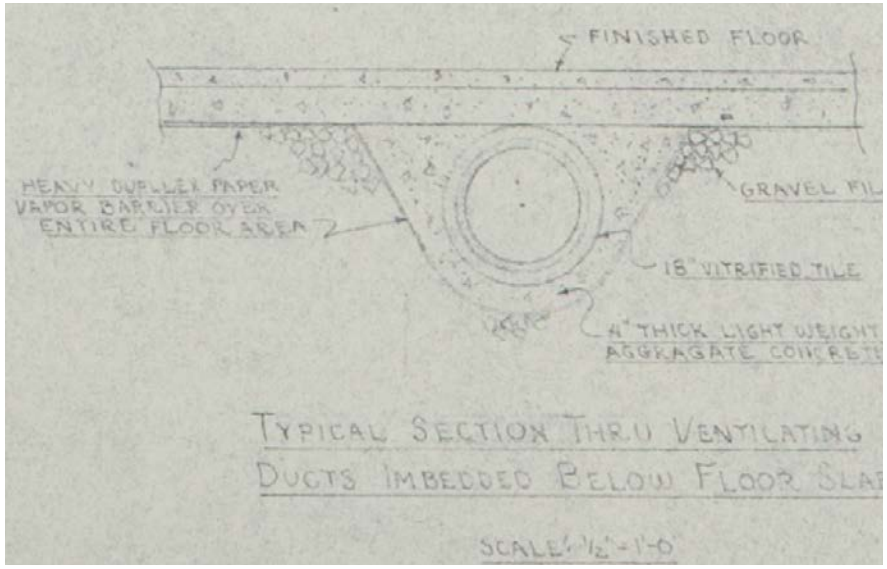


Fig. 6.13.1 Detail of supply/return air duct below floor slab from Saarinen drawing M-1. Date 1955. Credit: MHG B006 f053 005-707, Miller House and Garden Collection (M003), Newfields Archives

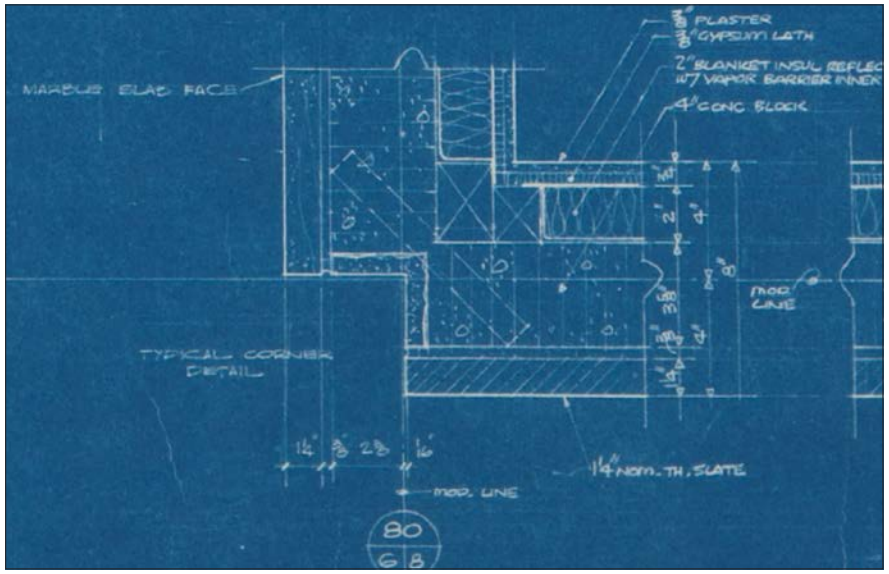


Fig. 6.14.2 Detail of window framing, Sheet A-7. Date 1955. Credit: MHG_IIIa_ FF041_014, Miller House and Garden Collection (M003), Newfields Archives

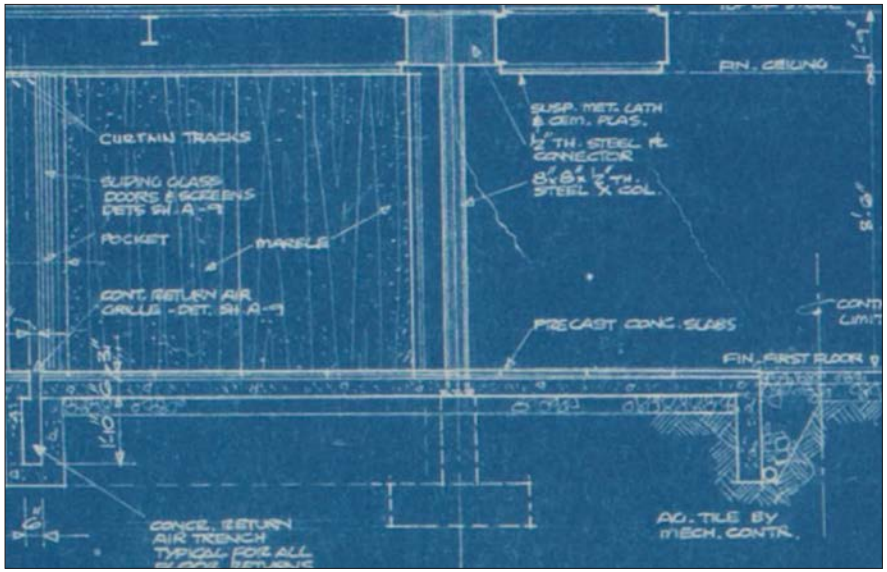


Fig. 6.14.1 Detail floor slab at exterior walls and plinth, Sheet A-10. Date 1955 Credit: MHG_IIIa_FF042_001, Miller House and Garden Collection (M003), Newfields Archives

Fig. 6.15.1 Aluminum-framed micarta panel, supply-air grille, light switch banks and electrical receptacles. Date June 2021. Credit: Michael C. Henry

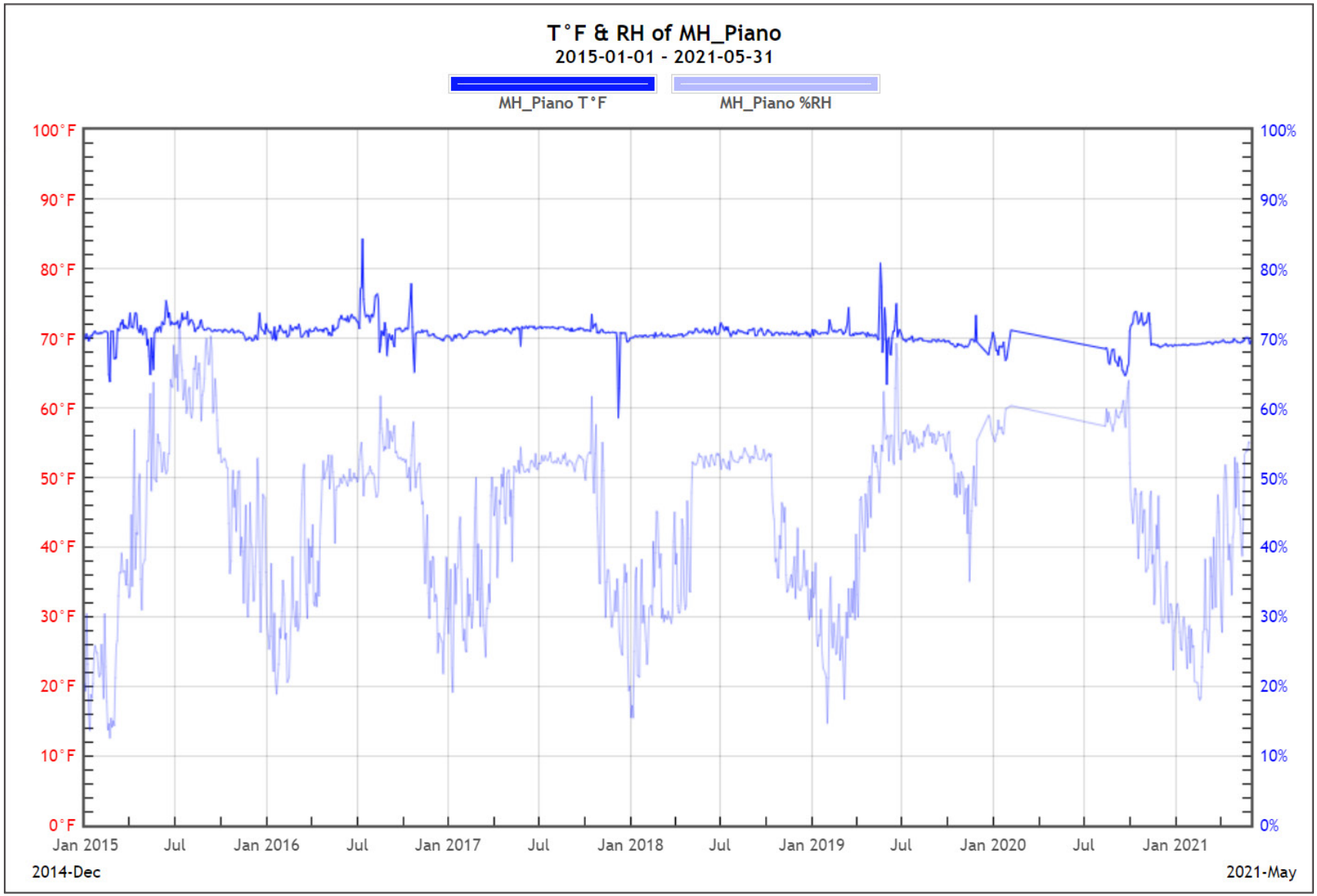


Fig. 6.14.4 Temperature and relative humidity at the piano. Date 2015 to May 2021 Credit: eClimateNotebook, Newfields account

There is a practical limit for the interior relative humidity level that can be safely maintained in the Miller House during winter without damage to the historic building fabric. This cannot be determined until temperature and moisture data have been collected for the cavities of the roof/ceiling assembly and the design intent and effect of the turbine vents can be clarified.

6.15 ARTIFICIAL LIGHTING SYSTEMS[150]

> "I know one thing Grampa wants—indirect lighting. Me too. I guess. Remember the screen in Eero Saarinen's house? That was a clever way to light that room."
>
> -Xenia Simons Miller[151]

> "Another element that adds enormously to the family's pleasure is the way the lighting is woven through the structure. Bands of intersecting skylights pierce the roof and also border the outside walls. The house is alive with light. There is overhead illumination by day and by night..."
>
> *-House and Garden*[152]

Design and Construction History

The intentional coinciding placement of sources of natural light and artificial light from fluorescent strip lights at the ridge of the interior and exterior skylights is a character-defining element of the Miller House.[153] Both light sources illuminate spaces while serving to highlight the structural grid and wash vertical surfaces, textures and the objects present on or within the surface planes of the walls. At night, the skylight lighting appears to "lift" the roof structure, giving the impression that it floats above the walls.

On the interior, ceiling-mounted recessed downlights highlight furnishings and task areas. Adjustable can-lights are mounted on the sidewalls of the skylight channel above the Conversation Pit and to highlight art, as in the foyer.[154] A glass chandelier illuminates the Dining Room Table (see Section 8.3). Notably, the only traditional light fixtures, adjustable reading lamps with shades, are mounted on the wall on either side of the bed in the Master Bedroom.

In general, fluorescent lamps were used in the skylight cavities and incandescent lamps were used in the downlights and reading lamps.

The lights are typically controlled industrial-style toggle switches which activate the lights, presumably through relays, since the amperage capacity of the switches may be small. The dining room chandelier is controlled by a dimmer. The toggle switches are also used to operate exterior lighting, curtain drives, water features and other equipment. The switches are organized in banks and each switch is labeled with its function (Fig. 6.15.2). The switch banks are set in the aluminum-framed micarta panels with HVAC supply air grills and thermostats (Fig. 6.15.1). The micarta identifies a functional "control panel" surface as distinct from architectural surfaces such as marble, textiles, or paper. It is notable that the micarta is easier to clean than the architectural surfaces. The micarta-enclosures also form chases for building systems and services.

The headboard in the Master Bedroom contains a switch bank, but the function of the controls is not readily apparent (Fig. 8.15.3).

Prior Treatments

2020	Fluorescent strip lights in the skylight cavities were replaced with light-emitting diode strip lights.[155]

Existing Conditions

Minimal documentation of the controls for lighting and other operations exists, and the condition of the relays and wiring was not observed. The electrical power systems were not assessed, but the circuit brakers and panel boards appear to be original to the building and their functionality for overload protection is unknown.

6.16 ENTERTAINMENT SYSTEMS AND ACOUSTICS

Design and Construction History

Acoustics remain an unknown design aspect of the House, and one that might potentially be significant. Biographical sketches of Miller noted: "[He] loved music and played the violin. He owned a Stradivarius and a Guarnerius, and often in the evening he would play with friends or along with records called Music Minus One, in which the violin part was left out."[156]

Architectural acoustics was a relatively new field of engineering, beginning at the turn of the twentieth century with designs by Harvard professor Wallace Sabine for Boston's Symphony Hall. The Cambridge, Massachusetts firm of Bolt Beranek and Newman, formed just after World War II, were consultants for the Irwin Bank and other Saarinen projects, such as Kresge Auditorium at MIT and the Shed at Tanglewood.[157] In 1954, Kevin Roche wrote to the Millers: "We are to consult Bolt, Beranek and Newman on Acoustical properties of living area."[158] Other sources note "the low ceiling height in the house was predicated upon acoustics and the Millers' love of music."[159] The House may represent an early and rare example of the application of acoustics to a private home. Unfortunately, it was beyond the scope of the Conservation Management Plan to research these aspects of the project.

Prior Treatments

1976	Replacement of high fidelity/stereo systems with new technology.[160] The equipment is located in the Master Bedroom.
1979	Replacement of Master Bedroom television set with new technology.[161]

Based on records in the Newfields Archives, there were several iterations of audio and visual entertainment systems installed in the Miller House, some of which required alterations to cabinetry. It is clear that these systems were an important part of the Millers' enjoyment of their home, given the inclusion of both television and stereo systems in the Master Bedroom (Fig. 6.16.1).

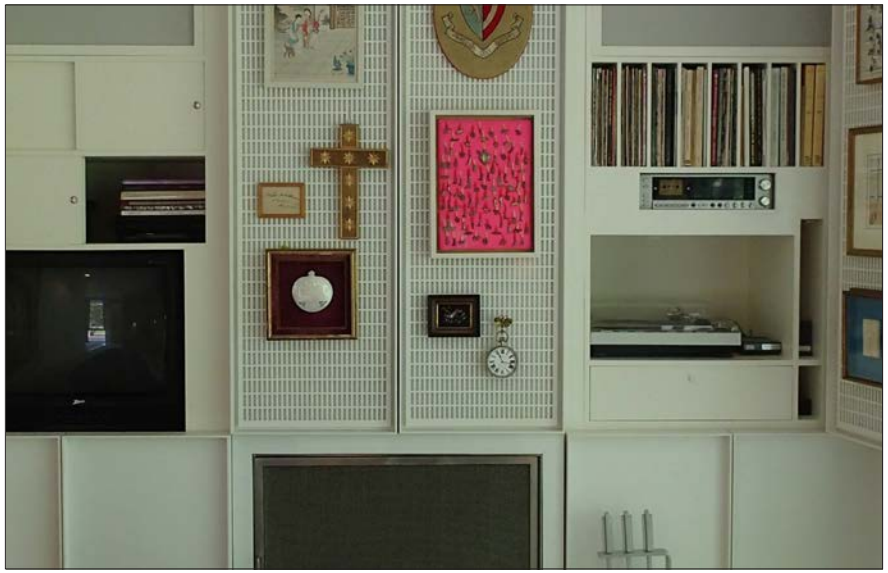


Fig. 6.16.1 Television and stereo system in storage wall of Master Bedroom. Date June 2021. Credit: Michael C. Henry

Existing Conditions

The functionality of the present audio and visual entertainment systems was not assessed.

OUTBUILDINGS

6.17 GREENHOUSE/OFFICE

Design and Construction History.

As noted in Section 3.7, the structure originally built as a greenhouse was renovated in the 1970s to the designs of Alexander Girard to become JIM's office. Character-defining elements include:

- Flat roof
- Projecting fascia that shades the window wall
- Window wall
- Storage Wall

- Wall finishes (carpet base)
- Floor finishes (carpet)
- Built-in desk

Prior Treatments

2011	Roof replaced.[162]
c. 2012	Condenser replaced.[163]
2015	Mold mitigation.[164]

Existing Conditions

Roofing and Drainage. The roof was not accessible for viewing during the assessment. Drainage appears to be internal. As with the main roof, the capacity of the roof and drainage system should be evaluated for its capacity to accommodate extreme rain events.

Pine needles and other organic matter are visible in the translucent panels above the south window wall, indicating build-up on the roof that could block roof drains (Fig. 6.17.3).

Water appears to be ponding in the planting bed; condition and capacity of the drain there should also be reviewed (Fig. 6.17.4). The soil there is nearly at the same level as the window sill, which could cause damage to the wood frame and sill and potentially flooding; lowering the soil level and/or replacement with a more porous material could be considered.

Pavers. Pavers on either side of the entry are cracked and displaced (Fig. 6.17.6 and 6.17.7).

Walls. There is no evidence of cracking or mortar loss in the CMU.

Windows. A splice joint in the window sill is visible and should be monitored. Loose sealant or caulking is visible at the base of the glazing (Fig. 6.17.9).

Interior Finishes. Finishes are in fair condition. There is water staining on the original ceiling tiles, which may pre-date the roof replacement 15 years ago.

Fig. 6.17.1 Greenhouse/Office, View from southwest. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.17.2 Greenhouse/Office: Detail of fascia over south window, showing exposed plywood edge. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.17.3 Greenhouse/Office: View of soffit over window, showing debris above plexiglass panels. Note also cracks and checking in plywood "lintel." Date: June 2021. Photo credit: Scattergood Design

Fig. 6.17.4 Greenhouse/Office: View of planter below south window wall showing build-up of earth and scouring around drain due to excessive runoff. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.17.5 Greenhouse/Office, view of east elevation showing utility entrances. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.17.6 Greenhouse/Office: depressed pavers at south end of entrance. Date: June 2021. Photo credit: Scattergood Design

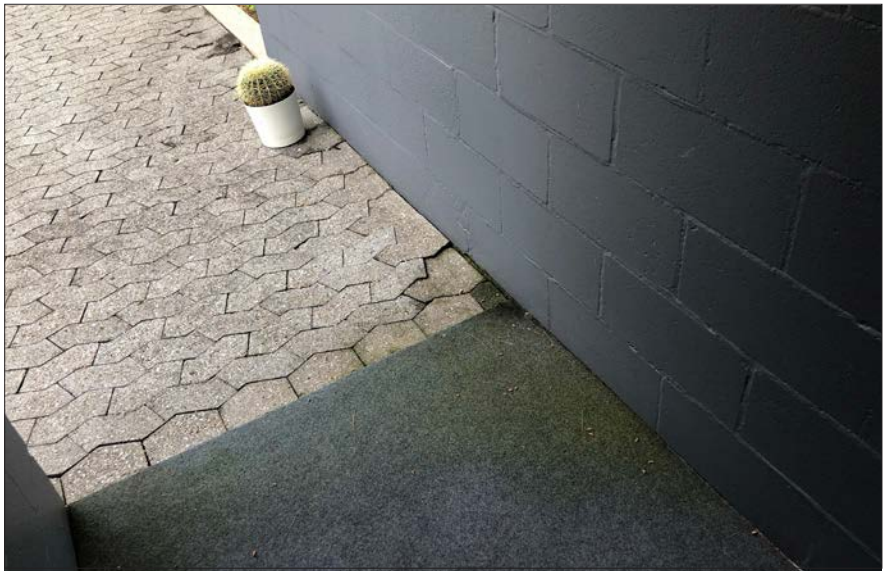


Fig. 6.17.7 Greenhouse/Office: misaligned and broken pavers adjacent to entrance. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.17.9 Greenhouse/Office: view showing loose glazing putty/caulk at bottom of windows. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.17.8 Greenhouse/Office: view of interior. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.17.10 Greenhouse/Office: stained ceiling tiles as a result of roof leaks. Date: June 2021. Photo credit: Scattergood Design

Fig. 6.17.11 Greenhouse/Office: evidence of drainage issues in mechanical area. Date: June 2021. Photo credit: Scattergood Design

6.18 ENDNOTES

[1] Gary R. Hilderbrand, *The Miller Garden: Icon of Modernism*, (Washington, D.C.: Spacemaker Press, 1999), 18. In a letter dated June 18, 1955, Kiley reported to Miller: "I suggested to Eero carrying out the precast concrete slab treatment as the surface for the terrace platform... . I am very enthusiastic about reproducing this type of surface. I would even go so far as to suggest that this same material be used on the interior, only with a more finely developed surface. Kevin is considering this now." Terrazzo was carried in the February 1955 specifications, and Kiley mentioned in the same letter to JIM: "I told [Saarinen] about the terrazzo slabs in your Father's garden." Did this suggest that Kiley thought terrazzo was not suitable for exterior use? The letter is unclear. See Dan Kiley to Charles [sic] Irwin Miller, letter, June 18, 1955, box 1, folder 2, Newfields Archives, http://archive.imamuseum.org/record/107/; and Eero Saarinen and Associates and Alexander Girard,

[2] The specifications call for extruded plastic—probably white—which makes the flooring read more continuously than would have been the case with traditional brass dividers; see Specifications, 7.2.

[3] Michael Webb, "Interview with Mr. and Mrs. J. Irwin Miller, 2760 Highland Way, Columbus, Indiana, June 13, 2000," p. 3.

[4] "H&G's Hallmark House No. 3: A New Concept of Beauty," *House and Garden 115*, no. 2 (February 1959), 112. The specifications had stipulated that the entrance was to be clad in polished Vermont Verde Antique marble; see Specifications, 7.2.

[5] "New Concept of Beauty," *House and Garden*, 112.

[6] MHG Ib_B007 f064 077, Newfields Archives.

[7] MHG Ib B007 f059 086-088, Newfields Archives.

[8] MHG Ib B031 f359 108, Newfields Archives.

[9] MHG Ib B031 f359 100, Newfields Archives.

[10] MHG Ib B031 f359 099, Newfields Archives.

[11] Owen Hungerford to Xenia S. Miller, memorandums, annotations, and instructions, February 10, 1989, MHG Ib B031 f359 072-085, Newfields Archives, MHG Ib B031 f359 072, summarized in Newfields Archives, Reference: Terrazzo Notes.

[12] Owen Hungerford to Xenia S. and J. Irwin Miller, memorandums and annotations, March 31, 1989, MHG Ib B008 f068 007, Newfields Archives, summarized in Newfields Archives, Reference: Terrazzo Notes.

[13] Beverly McDermott to Xenia S. and J. Irwin Miller, memorandum and annotations, August 4, 1994, MHG Ib B031 f359 047-050, Newfields Archives. Also MHG Ib B031 f359 044-046; MHG Ib B031 f359 047-050, , Newfields Archives.

[14] Beverly McDermott to Bob O'Donoghue, letter, September 23, 1994, MHG Ib B031 f359 026 and MHG Ib B031 f359 030-032, Newfields Archives,.

[15] "Notes from meeting with Lewis Carraro from Santarossa Mosaic & Tile on Tuesday, June 6, 2000, Regarding 2760 Exterior Terrazzo Terrace," June 2000, MHG Ib B031 f358 039, Newfields Archives.

[16] Sheila Behrman to J. Irwin Miller, memorandums, July 29, 2003, MHG Ib B031 f358 013-014, Newfields Archives.

[17] Eero Saarinen, "To a student, August 20, 1960," as quoted in Aline Saarinen, ed., *Eero Saarinen on His Work, a Selection of Buildings Dating from 1947 to 1964* with Statements by the Architect (New Haven: Yale University Press, 1968), 8.

[18] David G. De Long, "Rediscovering Eero Saarinen" in David G. De Long and C. Ford Peatross, eds., *Eero Saarinen: Buildings from the Balthazar Korab Archive* (New York: W.W. Norton & Company; Washington, D.C.: Library of Congress Visual Sourcebooks in Architecture, Design, & Engineering, 2008), 14.

[19] Jayne Merkel, *Eero Saarinen* (London: Phaidon, 2005), 155.

[20] Specifications, 15.2.

[21] A Contemporary Palladian Villa," *Architectural Forum 109*, no. 3 (September 1958): 127.

[22] Specifications, 15.2.

[23] "New Concept of Beauty," *House and Garden*, 112.

[24] Specifications, 5.1, 5.2.

[26] Specifications, 11.2.

[27] Specifications, 11.2

[28] Specifications, 15.2.

[29] Owen Hungerford to Xenia S. and J. Irwin Miller, letter, August 12, 1977, MHG Ib B007 f065 005, Newfields Archives.

[30] Virgil Taylor to Harold Higgins, letter, April 19, 1963, MHG Ib B007 f064 095-096, Newfields Archives.

[31] Owen Hungerford to J. Irwin Miller, letter, June 1, 1977MHG 1b B007 f065009, Newfields Archives.

[32] Owen Hungerford to Xenia S. and J. Irwin Miller, letter, August 12, 1977, MHG Ib B007 f065 005, Newfields Achives.

[33] Hinshaw Roofing & Sheet Metal Co., Inc. to Irwin Management, invoice, September 30, 1993, MHG Ib B029 F332 002, Newfields Archives.

[34] Owen Hungerford to Bruce Detmers, letter, August 4, 1978, MHG Ib B006 f058 010-011, Newfields Archives.

[35] Owen Hungerford to Kevin Roche, letter, May 15, 1978, MHG Ib B006 f057 053, Newfields Archives.

[36] Owen Hungerford to Dan Tabor, Tar Man Industries, letter, November 13, 1979, MHG MHG_Ib_B006_f057_002, Newfields Archives.

[37] Hinshaw Roofing & Sheet Metal Co., Inc. to Irwin Management, invoice, September 30, 1993, MHG Ib B029 F332 002, Newfields Archives.

[38] Ben Wever, email communication to Pamela Hawkes, March 10, 2022.

[39] Ben Wever, email communication to Pamela Hawkes, March 10, 2022.

[40] Karim P. Allana, "A Critical Review of the Life Span of TPO, PVC and Other Single Ply Roof Membranes" (paper, 11th Annual RCI Hawaii Winter Workshop, Honolulu, HI, 2011), https://www.abbae.com/wp-content/uploads/2020/04/RCI_11th_Honolulu_HI-Workshop-A-CRITICAL-REVIEW-OF-THE-LIFE-SPAN-OF-TPO-PVC-AND-OTHER-SINGLE-PLY-ROOF-MEMBRANES.pdf.

[41] International Code Council, Inc., "2020 Indiana Residential Code (Country Club Hills, IL: ICC Publications, 2020), table 1102.1.2, https://codes.iccsafe.org/content/INRC2020P1/chapter-11-re-energy-efficiency#INRC2020P1_Pt04_Ch11_SecN1102.

[42] Eero Saarinen and Associates, and Alexander Girard, Roof Plan and Details: "Skylight" Details, Miller House, February 18, 1955, A-5, MHG IIIa FF041 011, Newfields Archives.

[43] All information in this table from Ben Wever, email communication to Pamela Hawkes, March 10, 2022.

[44] Laura Thayer, Louis Joyner, and Malcom Cairns, "Miller House," National Historic Landmark (NHL) Nomination Form (Washington, D.C.: United States Department of the Interior, National Park Service, 1999), 8.

[45] David G. De Long, "Rediscovering Eero," 14. As noted by Penn Praxis team member Gregory Maxwell, the linear skylights are aligned with the structural grid but deviate in width from the modular grid.

[46] Will Miller, "Eero and Irwin," lecture, Ball State University College of Architecture and

Planning, January 30, 2006, video recording, accessed April 1, 2022, https://www.youtube.com/watch?v=XHbSj82prPQ.
[47] Specifications, 8-3. O'Keeffe's Inc. is still in operation, and their website notes that: "Holding the first patent in 1951 on using extrusions in the construction of skylights, allowing the weeping of any condensation or leakage to be taken to the outside by the extrusion's built-in guttering system. It wasn't long before the company was recognized for excellence in custom skylights, bringing natural daylight to thousands of creative and innovative monumental projects worldwide. These include the Museum of Modern Art and the Court of Appeals in San Francisco, the World Bank in Washington D.C., the Como Conservatory in St. Paul, MN, the Getty Museum and Gateway Center in Los Angeles, the Houston Galleria in Houston, and many more"; see "About O'Keeffe's," O'Keeffe's Inc, Architectural Building Products, accessed April 30, 2020, https://okeeffes.com/about-us/.
[48] Specifications, 9.1.
[49] Saarinen and Associates, and Girard, Roof Plan and Details: "Skylight" Details.
[50] G.W. Newlin to J. Irwin Miller, letter, August 12, 1957, MHG Ia B001 f008 064-066, Newfields Archives.
[51] Virgil Taylor to O'Keeffe's Inc., letter, August 19, 1957, MHG Ia B001 f008 054-055, Newfields Archives.
[52] Virgil Taylor to Harold Higgins, letter, April 19, 1963, MHG Ib B007 f064 095-096, Newfields Archives.
[53] Ernest R. Feidler to J. Irwin Miller, letter, June 14, 1967, MHG Ib B029 F332 036-037, Newfields Archives; and "Purchasing UF-3 Plexiglas for Roof Skylights," correspondence and memoranda, March 6, 1968 to May 22, 1968, MHG Ib B029 f332 010-021, Newfields Archives.
[54] "Roof Skylight Caulking," correspondence, March 6, 1972 to July 7, 1972, MHG Ib B029 F332 003-005, Newfields Archives.
[55] "Repairs to Fish Pond, Skylight Ballasts, Window, and Sliding Glass Doors," note, July 1973, MHG Ib B007 f061 043, Newfields Archives; and Owen Hungerford to J. Irwin Miller and Xenia S. Miller, memorandum, June 24, 1974, MHG Ib B005 f035 038, Newfields Archives.
[56] "Plexiglass Inserts on Skylights," correspondence, notes, and memoranda, November 16, 1994 to December 14, 1994, MHG Ib B029 F331 001-005, Newfields Archives.
[57] Taylor Brothers Construction Company to Irwin Management-IMC Advisors, invoice, August 18, 2016, MHG Ib B020 f220 007, Newfields Archives.
[58] Ben Wever, telephone conversation with Michael Henry, December 22, 2020
[59] Thayer, Joyner, and Cairns, "Miller House," NHL, 5.
[60] Xenia S. and J. Irwin Miller, interview by Michael Webb, Columbus, Indiana, June 13, 2000.
[61] "New Concept of Beauty," *House and Garden*, 112.
[62] Specifications, 6.1.
[63] L.D. Hoffman to J. Irwin Miller, memorandum, August 24, 1956, MHG Ia B001 f003 016-022, Newfields Archives.
[64] L.D. Hoffman to J. Irwin Miller, memorandum, August 24, 1956, MHG Ia B001 f003 016-022, Newfields Archives.
[65] Specifications, 7.2. Per the specifications, the source of the Madre Cream Alabama was to be the Moretti-Harrah Marble Co., Sylacauga, Alabama.
[66] "New Concept of Beauty," *House and Garden*, 68.
[67] Specifications, 11.1.
[68] Specifications, 7.2.
[69] Specifications, 12.2.
[70] Saarinen and Associates and Lewis and Associates, Miller House Exterior Wall Details Typical, April 26, 1955, A-7, MHG IIIa FF041 014, Newfields Archives.
[71] Dan Kiley and Jane Amidon, *Dan Kiley: The Complete Works of America's Master Landscape Architect*, 1st U.S. ed. (Boston: Little, Brown, and Company, 1999), 22. The NHL also stressed the significance of the transparent walls to the overall design, stating: "In the Miller House, the interior space is related to exterior space through several devices. Among these are large expanses of transparent walls, including walls of glass panels that open completely to the outside and insets that bring exterior space into the column grid." See Thayer, Joyner, and Cairns, "Miller House," NHL, 8
[72] David Dillon, "A Place No One Knows," in Gary R. Hilderbrand, *The Miller Garden: Icon of Modernism*, Landmarks 09 (Washington, D.C.: Spacemaker Press, 1999), 17
[73] Specifications, 8.1.
[74] Earl P. Baker and Harold S. Langland, *Architectural Metal Handbook* (Washington, DC: National Association of Architectural Metal Manufacturers, 1952), 19-21, 258.
[75] Specifications, 8.3.
[76] In a letter to JIM, Roche refers to extra costs for painting steel caused by exposure when lack of aluminum windows and Glide doors made it impossible to paint the previous winter; see Kevin Roche to Irwin Miller, letter, October 4, 1956, MHG Ia B001 f004 071-075, Newfields Archives.
[77] A 1952 catalogue for Alwintite Windows claimed that the General Bronze Corporation was "the foremost manufacturer of aluminum windows in the world today..." and that "they retain their attractive appearance for the life of the building." The catalogue included double-hung and sliding windows, but not casements, and referred potential customers to the Permatite Window Catalog for "monumental or institutional buildings where double-hung windows using larger sections than those shown in this catalog are required"; see Alwintite Division, General Bronze Corporation, Alwintite Aluminum Windows (Garden City, NY: Alwintite Division, General Bronze Corporation, 1952), accessed April 30, 2020, https://archive.org/details/AlwintiteAluminumWindows/mode/2up.
[78] Specifications, 9.1.
[79] The information in this section comes from an Excel file provided by Newfields titled ARC_M003_Reference_CurtainTimeline_2012-07 (hereafter referred to as "Newfields, Reference: Curtain Timeline") with transcriptions of correspondence related to the curtains.
[80] Newfields, Reference: Curtain Timeline.
[81] The information in this section comes from two files provided by Newfields which transcribe parts of documents in the Newfields Archives, arranged chronologically. One, prepared by W. Richards in 2012, is ARC_M003_Reference_CurtainTImeline_2012-07.pdf (hereafter referred to as "Newfields, Reference: Curtain TImeline"). The other is ARC_M003_Reference_DraperyMotorNotes_2013-05 (hereafter referred to as "Newfields, Reference: Drapery Motor Notes"). Specific documents are cited where relevant.
[82] W.L. Henderson to Alexander Girard, letter, November 4, 1958, MHG Ia B002 f010 047, Newfields Archives.
[83] Newfields, Reference: Curtain Timeline.
[84] Newfields, Reference: Drapery Motor Notes. MHG_Ia_B001_f007_025-026
[85] Ben Wever, conversation with Pamela Hawkes, June 3, 2021. Justin Grange, email communication with Michael Henry, February 18, 2019.
[86] "New Concept of Beauty," *House and Garden*, 100
[87] "New Concept of Beauty," *House and Garden*, 100
[88] Christopher Monkhouse, "The Miller House: A Private Residence in The Public Realm," in *Eero Saarinen: Shaping the Future*, ed. Eeva-Liisa Pelkonen and Donald Albrecht (New Haven: Yale University Press, 2006), 238. Monkhouse noted that Johnson had compared his Glass House to "the ruins of a burned-out farmhouse"; see Monk-

house, "The Miller House," 238.
[89] "Here is How Alexander Girard Goes About Designing a House," *House & Home*, November 1952, 128.
[90] Eero Saarinen, October 24, 1960, in Aline Saarinen, ed., *Eero Saarinen on His Work* (New Haven: Yale University Press, 1962), 12, as quoted in Ken Tadashi Oshima, "The Modern House in the Postwar Period, Part 7: Classically Modern: J. Irwin and Xenia Miller House by Eero Saarinen, Columbus, Indiana, USA 1953-1957," *A + U: Architecture and Urbanism* no. 5332 (May 1998): 124.
[91] Alexander Girard to Xenia S. Miller, memorandum, June 11, 1963, MHG Ib B006 f053 057-066, Newfields Archives.
[92] Dorothy Ezell to Xenia S. Miller, letter, August 16, 1967, MHG Ib B006 f053 005-007, Newfields Archives.
[93] Building Conservation Associates, Miller House, Summary of Observations, A Report, p. 42.
[94] "New Concept of Beauty," *House and Garden*, 75.
[95] "New Concept of Beauty," *House and Garden*, 73.
[96] "New Concept of Beauty," *House and Garden*, 76.
[97] Kiley in Kiley and Amidon, *Dan Kiley: The Complete Works*, 22, quoted in Merkel, *Eero Saarinen*, 158.
[98] Eero Saarinen in John Peter, *The Oral History of Modern Architecture: Interviews with the Greatest Architects of the Twentieth Century* (New York: Harry N. Abrams, Inc., 1994), 202.
[99] Deborah Lubera Kawsky, *Alexander Girard, Architect: Creating Midcentury Modern Masterpieces* (Detroit: Wayne State University Press, 2018), 50-52; and Monkhouse, "The Miller House," 238. According to Dillon, Kevin Roche also noted that "[Girard's] house in Grosse Pointe, Michigan...featured a sunken conversation pit that became the prototype for the Millers"; see Dillon, "A Place No One Knows," in Hilderbrand, *The Miller Garden*, 17.
[100] See image of the Living Room facing southwest in Steven Kyle, "Case Study House #9,"National Register of Historic Places Registration Form (Washington, D.C.: United States Department of the Interior, National Park Service, July 24, 2013), https://npgallery.nps.gov/NRHP/GetAsset/98b2226e-fe13-4098-b708-3801ac9834b6.
[101] "New Concept of Beauty," *House and Garden*, 67.
[102] Eero Saarinen to Alexander Girard, letter, March 10, 1954, MHG Ia B001 F002 118-121, Newfields Archives.
[103] J. Irwin Miller to Alexander Girard, letter, March 19, 1954, MHG Ia B001 f002 097-103, Newfields Archives.
[104] J. Irwin Miller, quoted in William L. Hamilton, "Design Notebook; Designer to World: Lighten Up," *New York Times*, September 14, 2000.
[105] "New Concept of Beauty," *House and Garden*, 67; Aleishall Girard and Stine Liv Buur, "A Pit for Conversation," *Vitra Magazine*, December 4, 2016, https://www.vitra.com/en-us/magazine/details/a-pit-for-conversation.
[106] Letter from XIM to JIM, quoted in Zeigler, "Xenia Simons Miller: Prairie Modernist.", pp. 27-28.
[107] J. Irwin Miller, quoted in Hamilton, "Design Notebook."
[108] Shelley Selim, email to Pamela Hawkes
[109] J. Irwin Miller, quoted in Charles E.M. Rentshler, *The Cathedral Builder: A Biography of J. Irwin Miller* (Bloomington, IN: Authorhouse, 2014), 151.
[110] See sketches MHG_IIIc_FF068_001 through MHG_IIIc_FF068_020.
[111] Alexander Girard to J. Irwin and Xenia S. Miller, letter, August 30, 1956, MHG Ia B001 f005 002-003, Newfields Archives.
[112] Alexander Girard to J. Irwin and Xenia S. Miller, letter, August 30, 1956, MHG Ia B001 f005 002-003, Miller House and Garden Digital Collection, Newfields Archives.
[113] George Newlin to J. Irwin Miller, letter, October 22, 1956, MHG Ia B001 f004 048-051, Miller House and Garden Digital Collection, Newfields Archives; Eero Saarinen and Associates, Fireplace Plan and Section, Miller House, December 10, 1956, SK-21, MHG IIIa FF052 015-016, Newfields Archives.
[114] John Comazzi, "Change Over Time: The Irwin Miller House in the Photography of Balthazar Korab," in W*here Do You Stand: 99th ACSA Annual Meeting Proceedings*, ed. Alberto Pérez-Gómez, Anne Cormier, and Annie Pedret (Washington, DC: ACSA Press, 2011), 460, https://www.acsa-arch.org/chapter/change-over-time-the-irwin-miller-house-in-the-photography-of-balthazar-korab/. Will Miller related that Korab said that he had left architecture to become a photographer because he had had to make 150 different designs for the fireplace; see W. Miller, "Eero and Irwin."
[115] J. Irwin Miller in Xenia and J. Irwin Miller, interview by Michael Webb; Balthazar Korab and Eero Saarinen, Miller house, Columbus, Indiana, 1953-57, Model of variant fireplaces, [between 1953-1957], photograph, Balthazar Korab Collection, Library of Congress Prints and Photographs Division, https://www.loc.gov/item/2018673184/.
[116] "New Concept of Beauty," *House and Garden,* 110.
[117] "New Concept of Beauty," *House and Garden*, 110.
[118] Xenia Miller, Irwin-Sweeney-Miller family collection, Indiana Historical Society (no specific item cited) in Connie Zeigler, Xenia Simons Miller: Prairie Modernist, Commercial Article 11 (Indianapolis: Commercial Artisan, 2018), 29.
[119] Eero Saarinen and Associates and Samuel R. Lewis and Associates, Miller House Basement Plan & Details: Mechanical, November 22, 1955, M-1, MHG IIIa FF047 002, Newfields Archives; and Eero Saarinen and Associates and Samuel R. Lewis and Associates, Miller House First Floor Plan: Mechanical, April 26, 1955, M-2, MHG IIIa FF047 004, Newfields Archives.
[120] The Trane Co., 2-15 Multi-Zone Climate Changer, mechanical drawing, June 22, 1955, A-2804/8414, MHG IIIa FF047 006, Newfields Archives.
[121] Minneapolis-Honeywell Regulator Co., Mechanical Control Systems, mechanical drawing, April 12, 1957, IND-55042-ICS, MHG IIIa FF047 009, Newfields Archives.
[122] Saarinen and Associates and Lewis and Associates, Miller House Basement Plan and Details: Mechanical, November 22, 1955, M-1, MHG IIIa FF047 002, Newfields Archives.
[123] Saarinen and Associates and Lewis and Associates, Miller House Basement Plan and Details: Mechanical, November 22, 1955, M-1, MHG IIIa FF047 002, Newfields Archives.
[124] Kevin Roche to J. Irwin and Xenia S. Miller, letter, November 26, 1954, MHG Ia B001 f002 065-066, Newfields Archives.
[125] Owen Hungerford to Kevin Roche, letter, August 16, 1978, MHG Ib B010 f096 048-053, Newfields Archives.
[126] Lewis Associates, Inc., Humidification System for Miller House, mechanical drawing, May 31, 1967, M-1, MHG IIIa FF047 012, Newfields Archives.
[127] Minneapolis-Honeywell Regulator Co., Mechanical Control Systems, mechanical drawing, August 16, 1967, IND-55042-ICS, MHG IIIa FF047 010, Newfields Archives.
[128] Manufacturer did not have record of manufacturing date for the existing boiler (Model MR-750C-PV, serial number MKL-1126) but nameplate cites 1994 version of ANSI Z21.13 Boiler Code.
[129] No record found and no date indicated on unit.
[130] Replacement date based on date code embedded in manufacturer's serial number.
[131] Dunlap & Company, Inc., J.I. Miller Mechanical Room – Existing Plan, January 21, 1999, M-1, MHG IIIa FF047 013, Newfields Archives.
[132] Based on screen shots at system monitor.
[133] Jean-Luc Howell, conversation with Michael Henry, February 12, 2019.
[134] Surface areas estimated using original design drawings.

[135] Association for Preservation Technology International and American Institute for Conservation of Historic Artworks, New Orleans Charter for Joint Preservation of Historic Structures and Artifacts, 1992, https://www.getty.edu/conservation/publications_resources/research_resources/charters/charter49.html; ASHRAE, "Museums, Galleries, Archives, and Libraries," in *ASHRAE Handbook – Heating, Ventilating, and Air-Conditioning Applications*, (Atlanta, GA: ASHRAE, 2019), 24.1-24.46.
[136] "Museums, Galleries, Archives, and Libraries," in *ASHRAE*, 24.1-24.46.
[137] Thomas Leslie, "'Insulation with Vision': The Development of Insulated Glazing, 1930–1980," *APT Bulletin: The Journal of Preservation Technology 49*, no. 4 (2018): 26, accessed December 14, 2020, https://www.jstor.org/stable/26632385.
[138] Saarinen and Associates and Alexander H. Girard, Miller House Storage Wall Living Area, July 8, 1955, A-13, Miller House and Garden Collection (M003), Newfields Archives
[139] Electrical power systems were not assessed.
[140] Xenia Simons Miller, Irwin-Sweeney-Miller Collection, Indiana Historical Society, no source cited in Zeigler, "Prairie Modernist," 29.
[141] "New Concept of Beauty," *House and Garden*, 59.
[142] "New Concept of Beauty," *House and Garden*, 69.
[143] "New Concept of Beauty," *House and Garden*, 69.
[144] Ben Wever, telephone conversation with Michael Henry, December 22, 2020.
[145] Robert Campbell, "Industrial Strength Humanist: J. Irwin Miller Knew How To Get Things Built," *The American Scholar 74,* no. 1 (Winter 2005): 120.
[146] "Persistent Innovation: the History of BBN Technologies," (January 5, 2015), https://www.raytheon.com/sites/default/files/rtnwcm/groups/gallery/documents/digitalasset/rtn_221418.pdf accessed 29 April 2022.
[147] Kevin Roche to J. Irwin and Xenia S. Miller, letter, December 6, 1954, MHG Ia B001 f002 062-064, Newfields Archives. Richard Bolt was engaged as consultant for the UN Headquarters and turned to Leo Beranek of MIT for assistance; the acoustic consulting services were incorporated in a new firm, Acentech, in 1989; see "Raytheon BBN Technologies," Wikipedia, accessed March 28, 2022, https://en.wikipedia.org/wiki/Raytheon_BBN_Technologies. For future research, it should be noted that the BBN papers are at the MIT Archives; see Leo Beranek Papers, Massachusetts Institute of Technology Libraries, Department of Distinctive Collections, Cambridge, MA.
[148] Hamilton, "Design Notebook."
[149] Owen Hungerford to CMC Stereo Center, letter, March 18, 1976, MHG Ib B006 f050 049, Newfields Archives.
[150] Owen Hungerford to J. Irwin Miller, memorandum, March 15, 1979, MHG Ib B010 f096 005-006, Newfields Archives.
[151] Justin Grange, email to Shelley Selim, February 18, 2019.
[152] Ben Wever, interview with Pamela Hawkes, June 3, 2021.
[153] Ben Wever, email to Pamela Hawkes, June 3, 2022.
[154] Ben Wever, email to Pamela Hawkes, June 3, 2022.
[155] Hamilton, "Design Notebook."
[156] Justin Grange, email to Shelley Selim, February 18, 2019.
[157] "New Concept of Beauty," *House and Garden*, 68.
[158] Kevin Roche to J. Irwin and Xenia S. Miller, letter, November 26, 1954, Newfields Archives.
[159] J. Irwin Miller, quoted in Hamilton, "Design Notebook."
[160] Shelley Selim, email to Pamela Hawkes.
[161] Shelley Selim, email to Pamela Hawkes.
[162] "New Concept of Beauty," *House and Garden,* 69.
[163] "New Concept of Beauty," *House and Garden*, 70.
[164] "New Concept of Beauty," *House and Garden*, 70.

7
Understanding the Landscape

7 UNDERSTANDING THE LANDSCAPE

7.1 METHODOLOGY AND INTRODUCTION

Methodology

In keeping with the design values and significance of the Miller House and Garden (MH&G), this section is organized to reflect the importance of understanding the whole site—buildings, interiors, landscape—while detailing the character-defining elements (CDEs) making up the whole. This introduction is followed by a section describing the overall structure, presence, and condition of the Garden. This is followed by several sections outlining in turn the composition and integrity of each CDE as outlined in Section 5.4, roughly ordered by their prominence in the overall landscape design (starting with the most prominent).

As with Section 6, each CDE of the landscape is discussed with reference to:

- *Design and Construction History*
- *Prior Treatments*
- *Existing Conditions*

The landscape conditions were assessed by: Randall Mason of PennPraxis and David Rubin and Brian Staresnick of David Rubin Land Collective. The methodology included:

- Observation and documentation of existing conditions on June 1–4, 2021, and in several visits by various team members in preceding years;
- Review of documentation and scholarship on design intent, construction, and previous maintenance. Note that this was limited to published and archival accounts that were identified and/or recorded and available to consultants at the time of the report, and thus may not be a fully representative and inclusive list of all work previously done;
- Discussions and tours with Newfields staff; and
- Collaborative discussion and analysis with team members.

Recommended policies to address observed conditions are provided in Section 10.

Introduction

The Miller Garden is regarded uniformly as a master work of modern landscape architecture. Dan Kiley's masterful interweaving of grids and planes, establishing distinct rooms and paths, create a complex visual choreography integrating architecture and landscape (interior and exterior).[1] Making landscape "rooms" in close relation to the House's design was essential to the overall conception and many details of the Miller Garden. In his 1999 *Complete Works*, Kiley elaborated on this idea, writing of his:

> devotion to the tenets of emerging landscape architecture as spelled out in Margaret Goldsmith's 1943 *Designs for Outdoor Living*: to extend "house-living area into outdoor rooms"; to encourage "the value of living close to out-of-doors"; to promote the concept of the "whole terrain as a single unit of three-dimensional space made of up smaller units of design."[2]

The Miller Garden and its many landscape elements were designed subsequent to the design of the House. Numerous scholars and the highest historic preservation designation (National Historic Landmark) have reinforced this distinctive and highly significant landscape design. The design ideas, and contexts thereof, are covered in greater depth in Sections 2 and 3. Because of the high quality and exalted reputation of the whole design by Kiley in collaboration with Eero Saarinen and the Millers, the presumption is that most elements of the place contribute to the overall character and significance of MH&G. The CDEs, defined in Section 5.4, identify the landscape elements that were combined to give the Miller Garden its particular spatial experience. This organizational scheme comes with the caveat that the conservation of the character, integrity, and significance of the whole landscape is the ultimate goal of the CMP. In describing these CDEs, the subsections below note substantial changes that have been made to materials or the design over time. Overall, the Garden retains its material, formal,

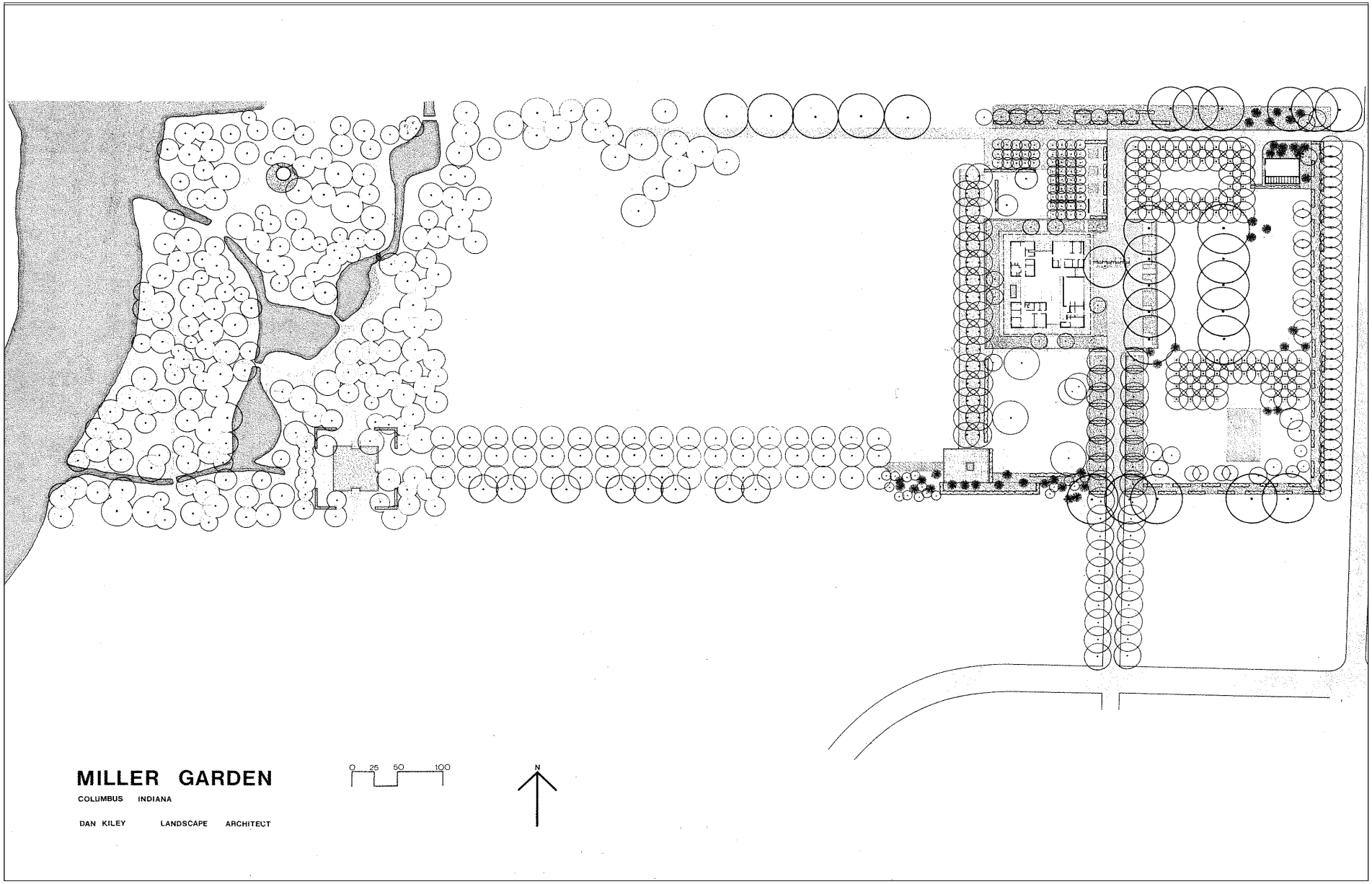


Fig. 7.1.1 Kiley's final published plan of Miller House and Garden landscape. Date: 1957. Photo credit: Brooks 2011, endpapers.

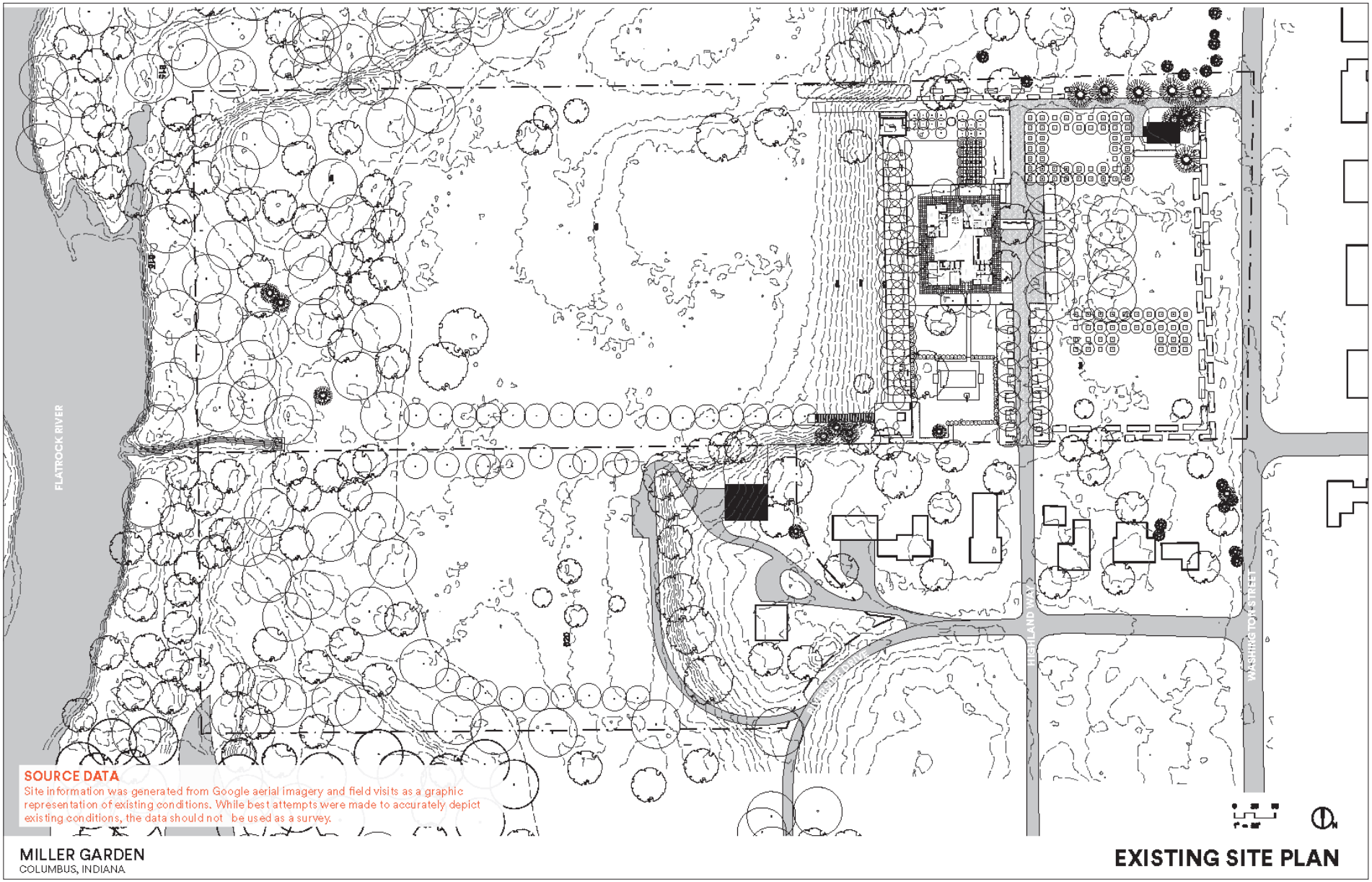


Fig. 7.1.2 Existing conditions plan. Date: 2021. Photo credit: PennPraxis/DAVID RUBIN LandCollective.

spatial, and functional integrity.

The analysis conveyed here is based on archival documentation and secondary sources as well as field confirmation and conversations with Newfields staff. Historical sources and team photography have been used to confirm details. A note about reception and its effects on CDEs: the issue of reception is interesting and a potentially important influence on our perceptions of CDEs. After the landscape's completion in 1958, few outsiders saw it for 20 to 30 years. The Millers still lived there, of course, and often declined inquiries to visit and document the place in order to preserve their family privacy. As Gary Hilderbrand and landscape architect Joseph Disponzio both note, the landscape architecture field was slow to see the quality of what was later regarded as a masterwork.[3] When it came into view for the profession it was mature, principally known through the widely-viewed photographs of Balthazar Korab, Ezra Stoller, and Alan Ward.[4]

This is the garden, the mature version, that is emphasized in many critics' and scholars' interpretations, and perhaps the landscape that many expect to be preserved. Though it must be remembered that any designed landscape—no matter how iconic its design—changes, evolves, matures, and is adapted by clients by small and large measures. One should not fall in love with any one moment of a garden, but rather seek to sustain the abiding spatial, experiential, material, and ecological qualities that give it distinctiveness in regard to its presence as a garden, bringing artificial order to natural life, and to its significance in terms of historic preservation.

7.2 OVERALL SPATIAL STRUCTURE AND PATTERN

As a prelude to analyzing specific CDEs of the landscape, it is helpful to conceptualize the design of the whole site organized around three zones of distinctly different character, design, and function. These zones are elaborated in Kiley's design, but had already emerged in Saarinen's initial thinking about the site with the Millers, and indeed from the shape of the landscape when the Millers first acquired it:

- the House and immediately surrounding landscape spaces, a zone of great complexity and density of different uses, spatial elements and materials;
- the Meadow, dominated by a large, mostly flat grass lawn gently creating a sense of openness between the House's plinth and surrounding gardens, and the forested edge of the riverbank zone, clearly bounded on the south edge and open to the northern neighboring property's lawn; and
- the Flatrock River banks, flood plain and forest, designed to appear more naturalistic.

The diagrams of these zones approximate the rooms Kiley intended users to encounter as distinct experiences. Within each of these three gross zones, various landscape elements are combined to create the spatial syntax that distinguishes Kiley's organization of the property. The CDEs (detailed below) vary in size, orientation, species composition, and placement: allées, grids of densely planted trees, few specimen trees, structured rectilinear hedges, planes of low ground cover.

Careful variety, juxtaposition, and interweaving of grid-based spatial structures distinguish Kiley's design; the structure of the landscape design is carefully tuned to the design of the House. Views and circulation of both landscape and building are dynamically related—rarely are they perfectly symmetrical, more often slightly off-centered, pinwheeled—creating a fine grain of spaces of different character while reinforcing and clarifying the centrality of the House and its own dynamic grid separating functions and intentionally framing views. The grids of trees function to occupy space. Allées create space for human movement. The linear elements (hedges as well as the Allées) serve as more than lines and edges—they have width and occupy space themselves while defining rooms. For instance, the allées and staggered hedges are not simply lines separating rooms, they are spaces connecting rooms.

The clear sense of order in the landscape seems to have softened and deepened over nearly 70 years of maturation. Even where new replacement plantings have been made, the plantings always serve the whole spatial order of the landscapes and their experience. Throughout the landscape, elements have been replaced or adaptations made due to plants failing to thrive, climate change, changes in function/use, or decisions by the Millers to adjust the design. This history of thoughtful replacement and adaptation demonstrates the

Fig. 7.2.1 Character zones diagram (overall site). Date: 2021. Credit: PennPraxis/ DAVID RUBIN LandCollective.

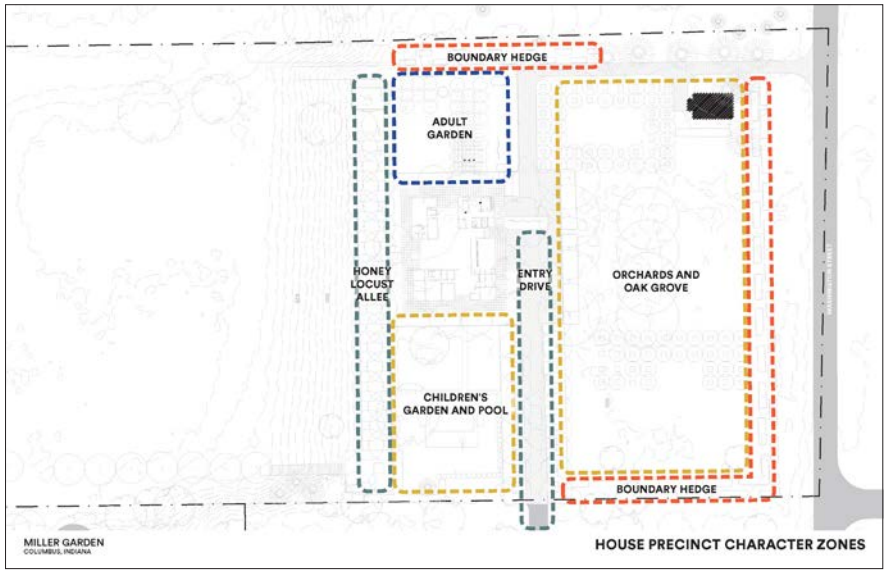


Fig. 7.2.2 Character zones diagram (overall site). Date: 2021. Credit: PennPraxis/ DAVID RUBIN LandCollective

resilience of the landscape design as managed—as long as its spatial structure, relationships to the House, and to functions are maintained, the integrity of the landscape is retained. As noted below, replacements and adaptations (in-kind or with new species) are deeply woven into the landscape today, from the better-known and more obvious examples of the Entry Drive horse chestnuts replaced with buckeyes or the Adult Garden redbuds replaced with crabapples, to the more subtly changing ground covers in several places, replacement honey locusts in the iconic Allée, and the wholesale replanting of the Apple Orchards in the East Lawn.

Plant materials throughout the Miller Garden landscape were chosen with great care, for specific shapes that support the different spatial configurations and functions (horse chestnuts on the Entry Drive, honey locusts for the Allée on the western flank of the House, willows in the open Meadow, for example). Juxtapositions of different plants and arrangements convey careful stitching and weaving; all the arrangements are matter of artifice, very little in the landscape design could be called naturalistic. Careful consideration was given to seasons, blooming schedules and color schemes, owing to the Millers' seasonal use of their other residences in Canada and Florida.[5]

The strong spatial order of the whole landscape has required diligent maintenance—so it's no surprise that some significant replacements and replantings have been carried out over the years (noted in in the appropriate subsections below). The Miller Garden landscape has been continually revised, carefully preserved, and never fully restored. Given plants' life-cycles, a landscape can rarely be preserved in the literal sense. As with any landscape, plant materials are prone to show stress, die off prematurely (or naturally), are accidentally damaged, or just do not perform as well as hoped (the archives reveal a number of these).[6] Replacement in-kind has been fairly common (honey locusts, magnolias, apples).

A few substantial changes of plant materials have been made over the years, altering the character of individual plantings without diminishing the overall sense and significance for the visitor. In other words, replacement of plantings has often been executed such that the charac-

ter, spatial structure, and significance of the landscape is retained even if the original plants are changed. The most notable of these rehabilitation replacements include the replacement of original horse chestnuts along the Entry Drive that were suffering blight and other abnormalities with yellow buckeyes with quite similar structure, leaves and blossoms, and native to the area, and redbuds in the Adult Garden replaced with crabapples when suitable redbud stock was unavailable when they needed replacing in 1985-86.[7] In both cases, the number, placement and design of the original plantings was followed carefully. While Kiley was deliberate and specific about his choices in the original landscape, and this particularity was reinforced in the reception and interpretation of the Garden in print, the Millers exerted strong influence on the development of Kiley's design over time.

7.3 GRIDS OF UNIFORM PLANTINGS

APPLE ORCHARDS

Design and Construction History

Two grids of apple trees were placed in the East Lawn in the original design. These two small orchards —48 trees in the north, 34 in the south8 —flank the Allée of oaks that occupies the central position in this lawn. Both orchards were designed with an element of the grid removed to admit light into the center. This created the sense of a "room" of different, open character within each apple grid. The opening of the southern orchard aligned with a tennis court that once occupied the southernmost portion of the East Lawn (see 7.0.a). The original apple trees "came from the Millers' own farm outside Columbus."[9]

Prior Treatments

Site staff has carried out annual trimming and removal of dead limbs. As individual trees reached the end of their life they were removed—sometimes replaced in number (nine were replaced in 1998, for instance[10]), sometimes leaving the grids incomplete. In 2021, approximately a quarter of the trees were missing in both north and south orchard grids.

7.3.1 "Backlit trees in the Apple orchard." Date: 1999. Photo credit: Alan Ward in Hilderbrand, 47.

Fig. 7.3.2 Southern apple orchard, 2021, with missing and damaged trees. Date: 2021. Photo credit: PennPraxis/RM.

Existing Conditions

As this report is being completed, Newfields has recently completed wholesale replacement of both orchard grids.

ADULT GARDEN

Design and Construction History

The Adult Garden is so called because it is adjacent to the parents' rooms and the formal dining area, and in contrast to the children's rooms and gardens on the opposite side of the House. The two tree grids were designed and planted as redbuds in the original scheme. The smaller, western grid of 15 trees is arrayed on a bed of gravel. A portion of the larger eastern grid is mirrored at ground level by a varied checkerboard of groundcover. The squares of the groundcover accommodate the regular grid of 15 crabapples in three rows, and otherwise randomly alternate between concrete, utility vents, and seasonable flower and groundcover plantings. Relation of the grids to other elements is, of course, key: as they define a positive space of their own, they accentuate the planar surfaces of lawn and gravel; screen the utility yard and extension of the service drive. A round fountain (purchased in Rome in 1978 with a base designed by Girard) remains amid the grid.[11]

Prior Treatments

The redbuds had problems as early as the severe winter of 1957–58, and may have been replaced in 1958–59.[12] The redbud grids were certainly replaced in 1986 by crabapples in similar number and configuration as quality replacement redbuds were unavailable.[13]

Jack Curtis was involved in a replacement project in 1985–86 that resulted instead in crabapples currently in place. The western grid of 15 trees was replicated; the larger eastern grid was reduced from four rows wide to three. The northernmost three rows of crabapples were underlain by crushed stone. The remaining 15 (three rows of five continuing toward the House) were underlain by a varied grid of groundcover, paving, and vents.[14] At the same time, four low, linear ilex (Japanese holly) hedges inserted beneath the redbuds on a few edges of the tree grids were removed.

Tulips, begonias, and other plants added by the Millers in the groundplane checkerboard underlying the eastern grid of crabapples mark another of their contributions to the evolution and maintenance of the Garden.

Kiley regarded these 1986 changes as character-changing alterations to the Adult Garden, affecting the definition of the small lawn and other features of this particular garden.[15] Replacing the redbuds one-for-one, in largely the same grid, retained the integrity of the Adult Garden's spatial structure. But using single-trunk crabapples to replace the multi-trunked redbuds was not ideal. This compromise was occasioned by an unsuccessful search for quality mature redbuds in nurseries around the Midwest and East Coast.[16]

Some experts may disagree over the extent of the change represented by this switch in species. Gary Hildebrand noted, "The alteration of the fabric of Kiley's careful spatial handiwork was perhaps the only notable departure from an otherwise faithful protectorship of the property."[17] However, in the long view of landscape preservation, overemphasizing the original plant materials and minute details of each landscape element is a secondary concern to retaining the integrity of the spatial structure and experience.What is more important to the integrity of this garden "room" in particular (and to Kiley's landscapes more generally) is the underlying geometric logic and spatial structure. The two grids of small trees draw views to the edge of the Meadow and the north terminus of the Honey Locust Allée. This structure was reinforced by the replacement, was deemed acceptable to the Millers, and indeed preserved the legibility of Kiley's geometric and spatial inventiveness.

Existing Conditions

The crabapples are nearing the end of their life. As of June 2021, three have been removed in the west grid, rendering it incomplete; one is missing in the east grid. In May 2022, during the writing of this report, a windstorm took down a few more trees in these grids.In the underlying checkerboard squares of ground planting, pavers, and vents, the plantings are routinely replaced but wooden borders delineating the squares are deteriorated.

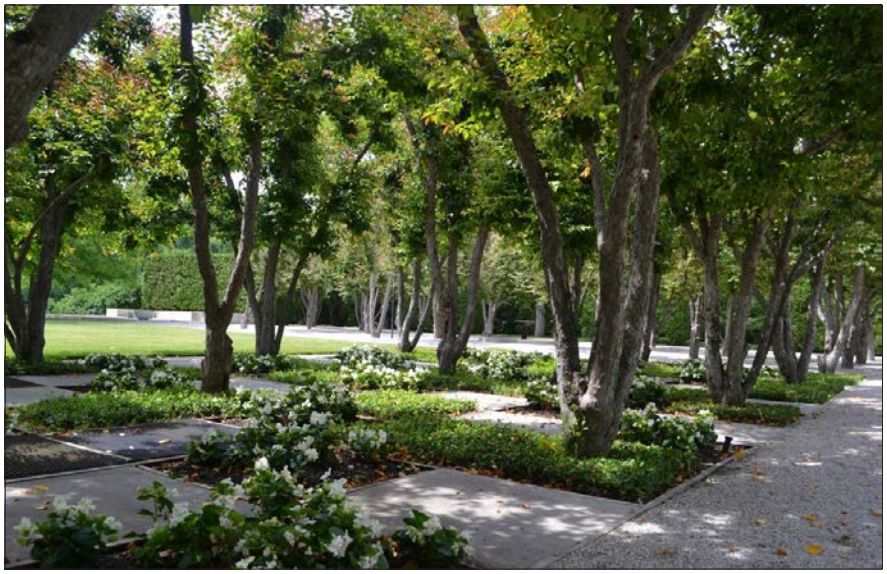


Fig. 7.3.3 Adult Garden, crabapple grids, looking northwest to north plaza of Honey Locust Allée. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.3.4 Adult Garden, crabapple grids, looking toward northwest corner of House. Date: 2021. Photo credit: PennPraxis/RM.

7.4 ALLÉES

ENTRY DRIVE

Design and Construction History

The linear structure of the Allée and the sequence of spaces that it structures along the Entry Drive defines the entry sequence of the Garden. The drive directs a distinct spatial experience through gate, along the drive, to the threshold of the House, comprising "a tight, dark green tunnel from which one emerges into the open parking court," originally lined by a double row of horse chestnuts and intervening arborvitae baffle (wing) hedges.[18] This structure was backed, to the west, by tall arborvitae hedge surrounding the Pool, eventually opening to a view of the House across the Children's Garden.

Prior Treatments

The horse chestnut trees of the original Allée experienced blight that caused early defoliation as early as 1956 (Kiley cited this as a reason he rarely uses them).[19] They were eventually replaced with yellow buckeyes, a species of very similar branch and leaf pattern, but native, in the same configuration pattern by IMA in 2013.[20] The arborvitae baffle hedges suffered in the shade of the horse chestnuts and were replaced by low, continuous taxus (yew) hedges in 1973.[21]

Existing Conditions

The Entry Drive extends Highland Way northward, tracing a line parallel to the House's front-door elevation; as it reaches the edge of the House podium it widens to accommodate parking and for turning into the Carport. The Allée of buckeyes contains the Entry Drive and is underpinned by low (approximately three feet) taxus hedges. All plantings are thriving. Overall, the Allée and its allied elements have seen substantial change in plantings, yet has retained its fundamental qualities of a staged, continuous, rhythmic interplay of trees, hedges, and paved surface marking one's arrival to the House.

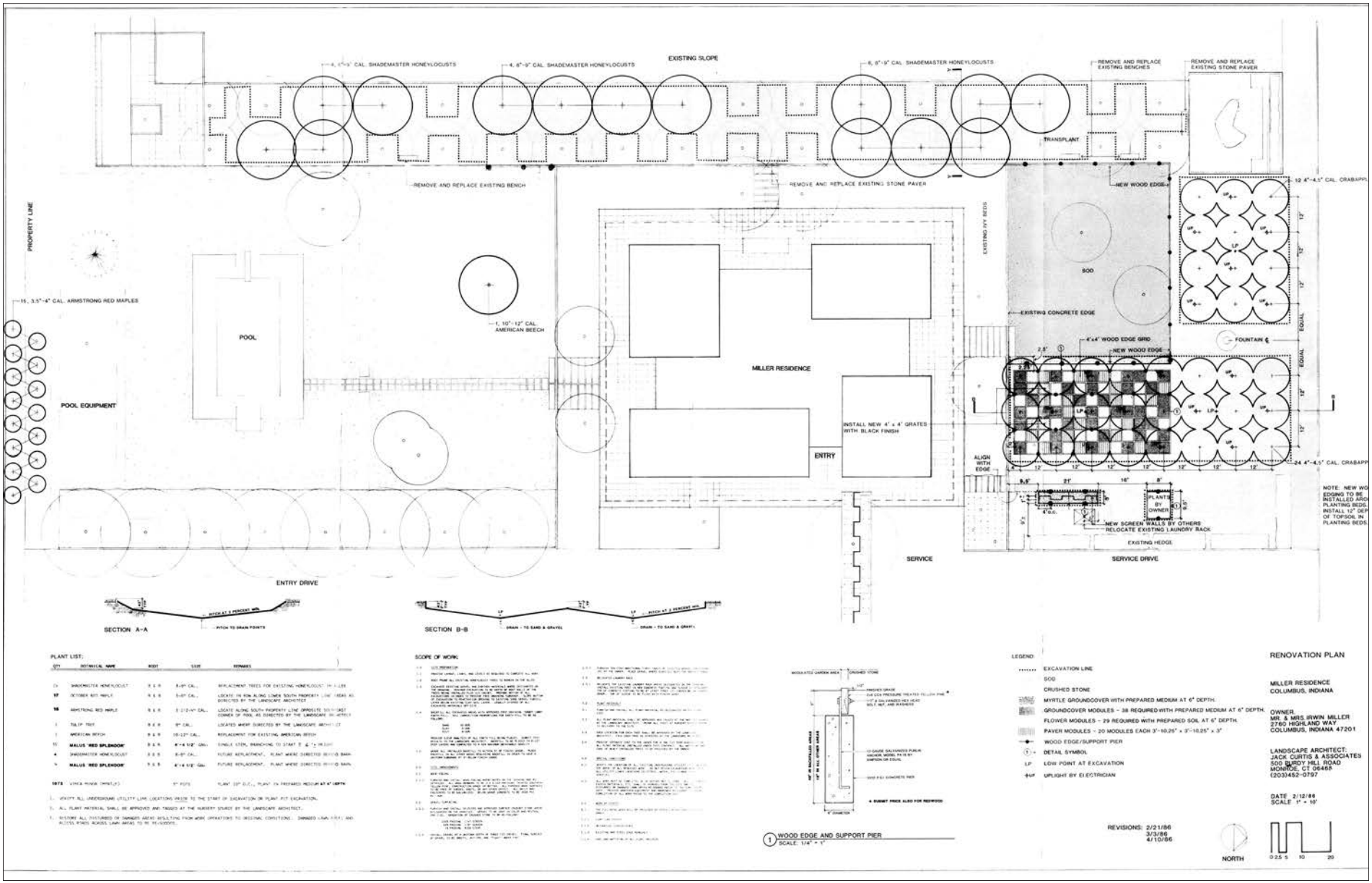


Fig. 7.3.5 Miller Garden renovation plan, revised blueline from Jack Curtis & Associates, Adult Garden and Honey Locust Allée. Date: April 10, 1986 Photo credit: Miller House and Garden Collection (M003), MHG IIIb FF058 021, Newfields Archives.

HONEY LOCUST ALLÉE

Design and Construction History

The Honey Locust Allée, located between the House and the Meadow, is perhaps the single most recognizable element of the Miller House and Garden landscape. The double row of symmetrical, uniformly spaced, high-limbed honey locusts creates a space (not simply a line) and functions almost as a loggia, an extension of the built space. The flat straight path between the rows is crushed granite.

The Allée is both its own space—the iconic promenade—and a buffer space between House and Meadow zones of the entire landscape. The Allée functions as a screen for views west from the Living Room as well as a promenade and view corridor running north-south and defining the edge of the House plinth. The Allée forms the long north-south border edge of the domestic spaces (the extended plinth, the Adult Garden to the north, Children's Garden/Swimming Pool to the south); from the west edge of the Allée, the Meadow's lawn descends, sharply at first, then gently, toward the distant forested river edge.

Functionally, the Allée is an axis that just ends; it does not lead anywhere, as allées often do. Kiley later describe the Allée as "a private boulevard that connects two intimate plazas."[22] He created two terminal spaces to mark either end of the Allée. Both spaces relate primarily to the Allée itself and secondarily to the garden spaces they immediately border. Original plans suggested general notions for their development as small platforms structured around gridded pavers and some central focal point feature. Only later, in the 1970s, would the Millers install the two sculptures that became well known in photographs of the Allée.

Prior Treatments

The Millers replanted the entire Honey Locust Allée in kind and in place twice, in 1986 (by Jack Curtis, who also replaced crushed limestone with crushed granite) and in 2009, shortly before IMA took ownership of the site (designed by Michael Van Valkenburgh Associates).[23] At other junctures in between these wholesale replacements, individual trees had also been replaced, in kind and at uniform scale.

The path's material was changed from limestone to granite in 1986, to alter the pH of the soil so the locusts would thrive.[24]

Existing Conditions

Roots of the locust are causing some damage to adjacent hardscape features (curbs edging the Adult Garden, the North Plinth). Phototropism is apparent in the middle of the Allée where the large weeping beeches take up substantial space and encroach on the eastern row of the Allée.

OAK ALLÉE IN THE EAST LAWN

Design and Construction History

The double allée of very tall white oaks is located in the East Lawn between the House's front entrance and Washington Avenue. This allée appeared early in the planning as a clear north-south axis paralleling the Entry Drive/Service Drive and its location and composition was not tinkered with (as other elements were) as the design progressed in from 1955–1958.

Prior Treatments

None known.

Existing Conditions

The Oak Allée consisted originally of ten trees, in two equal rows. Nine remain—the one missing tree (taken down in 2020) is in the northernmost position on the eastern side of the Allée. This is a fortuitous one to be missing in that it is farthest from the House entry and visitors' path and allows the design intent of the double row to be clearly represented by the nine remaining trees.

Fig. 7.4.1 Entry Drive, looking south. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.4.3 Honey Locust Allée, looking south. Date: 2021. Photo credit: PennPraxis/RM.

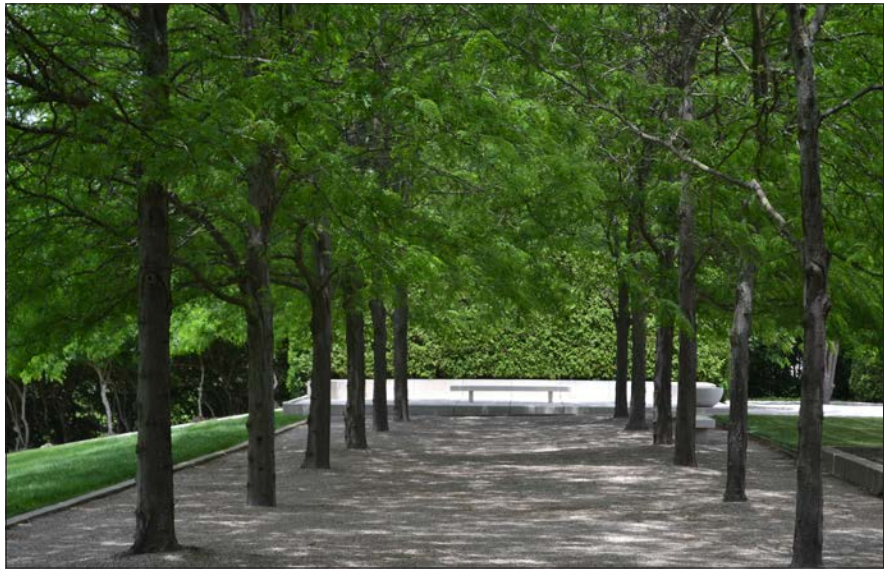


Fig. 7.4.2 Honey Locust Allée, looking north. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.4.4 Honey Locust Allée, looking north, noting the phototropic response of the first tree on the right. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.4.5 Oak Allée , east lawn, looking west toward the House. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.4.6 Maple Allée, looking west. Date: 2021. Photo credit: PennPraxis/RM.

MAPLES ON SOUTHERN EDGE OF THE MEADOW

Design and Construction History

This allée of maples lines the southern edge of the Meadow from its eastern edge (at the base of the House plinth slope) to the Riverbank Forest edge. This was the southern property boundary of the original site, and the 1953 pre-construction survey of the site indicates at least ten mature maples already aligned near this boundary. As part of the MH&G design, Kiley intended this allée to be a triple row.

Prior Treatments

Several replacement maples are apparent, replanted to maintain the allée geometry but undersized compared the original maples that dominate.

Existing Conditions

The Maple Allée marks the edge of the Meadow with a consistent line of trees, most of them fully mature. This line begins as a single row at the eastern end, transitioning to a wide double allée underlain with grass lawn. The walking path from House to Barn uses part of the Allée.

7.5 BUFFER HEDGES

STAGGERED ARBORVITAE HEDGES FOR THE EXTERIOR BOUNDARIES

Design and Construction History

Tall arborvitae hedges wrap much of the eastern portion of the property. They form the eastern boundary of MH&G along Washington Street and wrap around to parts of the northern and southern boundaries of the House precinct. Kiley designed the arborvitae as “staggered” rectilinear blocks, preventing views into the property while creating a dynamic, rhythmic surface along the public street. The hedges do not just mark a line, they have thickness, which reads clearly (from inside the space and from the road) in the deep offsets between rectilinear hedge elements. Each

of the repeated, rectilinear, carefully trimmed hedge blocks is approximately eight feet tall, six feet wide, and 18 feet long with six-foot spaces between them; the offset between inner and outer hedges is about four feet.

The staggered hedges are a strong CDE showing Kiley's prowess in interweaving different gridded and axial elements, creating spatial-visual buffers of great clarity but subtlety. The hedges inscribe the Millers' preference for privacy: "Mr. Miller didn't want to feel that he was keeping the community out, and yet he wanted privacy, so I said, 'Okay, Irwin, we'll put a hedge with openings, so the space kind of goes in and out, but you can't see in and you don't feel the line going out.'"[25]

The staggered hedges relate in material (arborvitae) to other hedges used as continuous screens in the House precinct (around the Swimming Pool, for instance). Along Washington Street, the hedges are the outer face of the property, separated from the road by a 30- to 40-foot grass verge (which was lined with mature sugar maples when the Millers acquired the property, and later removed).[26] Over time, some of the boundary arborvitae hedges have been replaced. Others are in poor condition and are losing their rectilinear shape; most have multiple wires supporting their shape internally.

Prior Treatments

As arborvitae aged out or otherwise failed, they have been occasionally replaced, but the overriding treatment concern has been retaining the shape and screening function of the hedges. They are continually trimmed, shaped, and repaired by site staff.

Over the years, as hedge plants have suffered or gaps have appeared, the blocks or individual plants have been replanted and/or internally supported by wires, many of which remain in place. Different varieties have been used in response to patterns of dominant shade of light. Kiley's office had previously suggested infilling struggling arborvitae with yew; it is unclear if this was ever implemented.[27]

Existing Conditions

Many of the arborvitae on the eastern and southern borders of the site are near the end of their life, are supported by interval wires, and will need replanting in the next ten years. A handful of hedge blocks comprising the southern and northern are severely damaged, fragmented, or missing altogether.

ENTRY DRIVE

Design and Construction History

Hedges form an important element of the Entry Drive design, filling spaces between the limbed-up allée trees and providing consistent bands of dark green foliage under the spreading limbs of the horse chestnuts. In 1973, the tall arborvitae wing hedges of the original design had been replaced with lower taxus (yew) hedges, which remain.28 The shading of the horse chestnut allée had prevented the arborvitae from thriving.

Prior Treatments

Continuous trimming helps retain the rectilinear form of the hedge blocks and keep the hedge height at approximately three feet, allowing for space between hedge tops and lower limbs of the buckeye (previously horse chestnut) allée.

Existing Conditions

All appear to be in good condition.

CHILDREN'S GARDEN

Design and Construction History

Arborvitae hedges planted in a single line bordering the garden spaces south of the House were primarily intended to ensure visual screening and privacy, given that these spaces were devoted to the children's activities and connected directly to the children's wing of the House. Kiley's design includes hedges screening all three non-House sides of this space.

Fig. 7.5.1 Arborvitae boundary hedge from the East Lawn, looking south. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.5.3 Arborvitae boundary hedge interior. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.5.2 Arborvitae boundary hedge from the east side of Washington Street, looking south. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.5.4 Entry drive yew hedge, looking south. Date: 2021. Photo credit: PennPraxis/RM.

When the Pool was constructed in 1963, an additional hedge was added between the Children's Garden (simply lawn and a few large shade trees) and the Pool. A decorative iron gate designed by Girard, protected the one gap in this added hedge. As the hedges matured they grew in height and density, providing a strong sense of enclosure.

Prior Treatments

In 2020, these tall arborvitae hedges around the pool were replaced with smaller, conical arborvitae plants donated from an Exhibit Columbus project. Though planted in the same position as the original block hedges, they will take some time to morph from individual trees to a consolidated hedge.[29]

Existing Conditions

The recently planted, conical arborvitae continue to show gaps between individual plants. They have not yet achieved the height or density to effectively screen between the Children's Garden and Pool.

Fig. 7.5.5 Children's Garden, new arborvitae hedge in middle distance, beech tree and lawn in foreground, looking southeast. Date: 2021. Photo credit: PennPraxis/RM.

7.6 MEADOW

Design and Construction History

The expansive Meadow was intended to be the visual focus of the westward view from the House, juxtaposed to all the buffered, screened, filtered views and rooms of the several other garden spaces gathered around the House.

The Meadow is the open, gently undulating lawn of much larger scale than any other space in the MH&G landscape. It did not require extensive grading except near the southern slope of what became the House plinth. The Meadow, as designed, reads as quite flat, about 15 feet below the level of the Honey Locust Allée, with very subtle changes in topography.

The Meadow is not, in technical terms, a meadow but rather a monoculture, meticulously mowed grass lawn. It is bordered on the west by the wooded edge of the Flatrock River zone. The scale and flatness of the Meadow's expanse is emphasized by the placement of a very few object trees distant from the House but within the open Meadow.

Prior Treatments

The Meadow is a monoculture grass lawn, mown close and constantly. Extraordinary effort, expense and carbon footprint is devoted to maintaining the Meadow as a lawn.

Existing Conditions

Rigorous mowing and maintenance of the Meadow results in a pristine green surface, inscribed with the east-west tracks of the mowers.

A cluster of a few scattered maples mark a space approximately two-thirds of the distance from House to Riverbank Forest edge. These trees were planted in the last few years; an earlier cluster of willow trees occupied the same location early in the MH&G period.

Fig. 7.6.1 Meadow, looking west from west side of the House (near the Conversation Pit), through the weeping beeches. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.6.2 Meadow, looking west, detail of northwest corner with group of recently planted maples. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.6.3 Meadow, looking east toward House from the edge of the Riverside Forest. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.6.4 Meadow, looking west from Honey Locust Allée to the edge of the Riverside Forest. Date: 2021. Photo credit: PennPraxis/RM.

7.7 SPECIMEN TREES

Design and Construction History

A few specimen trees planted in the plinth spaces around the House informally mark principal openings and views in each elevation. Weeping beeches on the west side work like additional drapes, filtering strong west light; magnolias elsewhere, in the ground-cover beds, mark this boundary space.

Elsewhere across the whole site, specimen trees were planted by Kiley, mostly at the edges of spaces that were to remain open—with the effect that the spaces' openness is reinforced by the few, informally-located object trees. For instance, the edges of the small lawn in the Adult Garden, the Children's Garden lawn, and the larger South Lawn are marked by few, sometimes single, mature trees of a variety of species (beech, locust, pear, yellowwood, maples, and willows all have been used). They are located informally, which is to say not according to any of the grids comprised the main spatial structure of the landscape.

Prior Treatments

Over the Garden's 60-plus years of life and evolution, many of the specimen trees have been replaced due to poor health, aging out, or changing preferences. While many of the trees comprising allée and grid plantings have been replaced in kind when their poor health necessitated, specimen trees have just as frequently been replaced by different species contingent on the tastes of the Millers, the advice of landscape architects (Kiley's office as well as Jack Curtis), and on the availability of adequate specimens from nurseries.

More specifically: magnolias and beeches immediately adjacent to the House have over time been replaced in kind; isolated trees in the East Lawn, southern and northern boundaries, and Meadow have been replaced by different species and in the same locations (though sometimes shifted slightly). Details of these many tree replacements are documented in the Newfields Archives, where many transactions have been rigorously documented by Irwin Management Company, in dialogue with designers and contractors.

Saucer magnolias are paired on north and south sides of the House (and were replaced in-kind in 2014-15).[30] Large weeping beeches mark the front entry to the House and the view from Conversation Pit to the Meadow.

Existing Conditions

As reflected in the Existing Site Plan, specimen trees remain in many garden spaces around House, located near the edges of lawns. They are regularly monitored and replaced as they age out or become diseased, with the result mix of some younger trees and more mature trees making up the whole collection. Magnolias and beeches remain in place. A recent wind storm damaged at least one of the magnolias adjacent to the House (see Fig. 7.7.1), which will be removed[31]; the beeches on west and east sides of the House overhang the roof enough to potentially cause damage and debris build up.

Fig. 7.7.1 Entry Drive, looking to carport. This magnolia was recently damaged in a wind storm and will be replaced. Date: 2021. Photo credit: PennPraxis/RM.

7.8 SMALLER-SCALE PLANAR ELEMENTS

Design and Construction History

Small areas of lawns, gravel, groundcover plants were employed by Kiley to mark the underlying planes of the complex landscapes around the House, establishing a consistent datum for his many garden rooms and elements. Juxtaposed with and between larger garden elements occupying three-dimensional spaces—strong vertical hedges, imposing tree grids, mature specimen trees—these modest planar lawns and beds play a modest but key role in the overall design.

In some instances, these planar elements serve a specific social function. Directly south of the House, two contained garden spaces were devoted to the children's recreation and the Pool. In the South Lawn, a space originally dedicated to a Play Court tucked into the south apple orchard was later removed.

The House is centered on a podium extending 25 feet all around, 10 feet of which is travertine then transitions to beds raised slightly above the main garden datum. These beds are planted in uniform, dark, evergreen species—changing over time (ivy, vinca, liriope) but uniform at any given time.

Prior Treatments

These spaces tend not to be very changeful: Lawns are mowed close, replaced periodically (due to construction disturbance, for instance) and intensively managed. Gravel and paved areas are maintained as such. The plantings in the groundcover beds bordering the House podium's travertine walkways, however, have changed over time. Most recently, in 2021, ivy is being replaced by liriope in all beds in 2022.[32]

Existing Conditions

The observed conditions of these spaces raised no particular conservation concerns.

Fig. 7.8.1 Adult Garden plinth beds (wit ivy removed, prepared for liriope planting) and lawn; magnolias, crabapple grid, and espalier screens in read. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.8.2 Children's Garden, looking south to pool from south side of the House. Date: 2021. Photo credit: PennPraxis/RM.

7.9 NATURALISTIC EDGE OF THE RIVERBANK FOREST

Design and Construction History

Kiley's scheme called for the western edge of the Meadow to remain a the forested riverbank zone. The forest, its understory, and riverbank are not formally designed. The forest edge is the backdrop of the distant view framed from the west side of the House. It has long been intended as a naturalistic woodland zone in contrast with Meadow and House gardens. (Kiley also proposed a "romantic garden" for this space, but it was never realized, and would have created a garden of extraordinarily different character to the rest of MH&G. The Millers declined the design.[33])

This forest edge features a few willows, the largest of which is in poor condition, and an original arborvitae from the 1957 planting left to grow naturally. The northern side of the Meadow is open to the neighboring property's closely mowed, open lawn. A few isolated trees (recently replanted maples) occupy a location off-center to the view and in its middle distance.

Prior Treatments

Treatment of the forest is meant to maintain a flood-safe buffer for the House and its surrounding gardens, and to visually mark the end of the distant view across the Meadow.

This CDE is principally the woodland edge, which pre-existed and was reinforced by Kiley's original scheme. The edge has since been managed to maintain the view from the House; it forms the green (or in winter, gray) backdrop to the view across the Meadow. With the growing awareness of flood risk, the riverbank forest is increasingly managed to provide resilience to flood events.

The land in this eastern part of the site consists of river, bank, forest, understory in an active flood plain and has been managed along naturalistic lines. Its forested character is maintained by regular mowing of the understory.

Though floods occasionally change the shape of the floodplain and the course of the streams, and inundate the Meadow, the river-edge zone retains its distinct, naturalistic character. This ground plane is also regularly mowed, which prevents understory trees and shrubs from establishing. And parts of this zone were underplanted with bulbs and flowering shrubs/trees as directed by XSM.[34]

Existing Conditions

The woodland edge includes some trees in poor health that will need replacing to maintain the clear demarcation of wood and meadow. The interior of the mixed woodland allows ample light to reach the forest floor. In addition to frequent mowing of the understory, this has encouraged invasive herbaceous growth. Some large trees are aging out. The riverbank per se is a dynamic zone, changing with the seasons and occasionally flooding. A concrete drainage culvert emptying into the river is functional and well-hidden by herbaceous growth and forest overstory.

Fig. 7.9.1 Riverside Forest edge, looking west from Meadow (near maple allée. Date: 2021. Photo credit: PennPraxis/RM. (Also see 7.6.4)

Fig. 7.9.2 Interior of Riverside Forest. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.9.3 Flatrock River edge of Riverside Forest. Date: 2021. Photo credit: PennPraxis/RM.

7.10 HARDSCAPE AND SCULPTURAL ELEMENTS

PAVERS

Design and Construction History

The Millers added Z-lock cement pavers in 1972, replacing an earlier blacktop surface.[35] These shallow serpentine-shaped pavers were unavailable in the United States; the Millers purchased them in Europe, thoughtfully procuring an additional supply to use for later repairs.[36]

Prior Treatments

Individual pavers have been replaced in-kind, from on-site stock, when they are broken.

Existing Conditions

When new pavers replace older broken pieces, the new replacement units do not visually match the adjacent pavers despite their being the exact same product (Fig. 67, BCA report). This discrepancy appears to be because weathering has eroded the cement binder at the surface of the older pavers, exposing more of the aggregate. With time, the more recently installed units are expected to weather similarly and should eventually blend in better with the adjacent units.

The paved surface is settling in two notable locations: the first, a small region of uneven pavers near the entrance to the house (Fig. 68, BCA report); second, a larger region at the eastern edge of the driveway spanning Entry and Service Drives (Fig. 69, BCA report). It was suggested that the latter location may be due to wear from tour shuttles and subsurface conditions. Additionally, concrete curbing separating and edging areas of service drive are deteriorated.

Fig. 7.10.1 Pavers on Entry Drive (showing newer, darker replacements pavers. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.10.2 Service Drive, south end (note damage to paving and depression at metal planter edge.) Date: 2021. Photo credit: PennPraxis/RM.

GATES

Design and Construction History

Modern iron gates were fabricated and installed by the IMA in 2011 to control the Entry and Service Drives. These were designed by Louis Joyner, and inspired by Girard. The Millers did not have gates on the drives.[37]

Ornamental wrought-iron gates, designed by Girard, are present on two sides of the pool area (Fig. 70, BCA report). They control openings in the arborvitae hedges bordering the Pool. (The Swimming Pool was an original part of the landscape design, but not realized until 1963.[38])

Prior Treatments

None known.

Existing Conditions

All gates appear to be in good repair and operational. The paint on the pool gates is beginning to fail, resulting in corrosion of the substrate (Fig. 71, BCA report). This condition is much more extreme on the gate at the Entry Drive on Highland Way. Corrosion at this gate has advanced to the point of total loss at several locations, which seem to be primarily welding points (Fig. 72, BCA report).

Fig. 7.10.3 Gate separating Children's Garden from pool, looking north to House. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.10.4 Adult Garden Fountain,. Date: 2021. Photo credit: PennPraxis/RM.

ADULT GARDEN FOUNTAIN

Design and Construction History

The simple, elegant fountain in the Adult Garden is situated between the two crabapple/redbud grids at the northern edge of this complex outdoor room. The nested circles of the fountain play beautifully off of the gridded bosques of trees to both sides, and the fountain's center-point marks an axis centered on the dining room and its terrace and parallel to the edges of the tree grids and a concrete walk. A bowl approximately 2-3 feet in diameter sits atop a decorative pedestal at a height of approximately 3 feet. The pedestal and bowl sit within a larger, circular light stone curb of about 10' diameter and 10" height. The curb forms a pool, the surface of which is covered with darker river cobbles.

The alabaster bowl was purchased by the Millers in Rome in 1957, as JIM reported to Girard in a 1957 letter: "While in Rome we purchased a Second Century Roman alabaster bowl for which we think you could design a base so that the bowl might be used as a fountain in the pool at the south end of the Locust Allee [sic][38]." This appears not to have been implemented; the bowl, it appears, was instead later integrated into the Adult Garden fountain.

The extant fountain was not part of the original Kiley design. The current version appears to have been created in 1977-78. Girard was commissioned to design a circular base of the fountain in 1978; the extant base is similar in dimensions and materials, though differs in design. However, a hand sketch on the working drawing greatly resembles the extant fountain.[39] The pedestal was apparently purchased by the Millers in Rome in 1978.[40]

Prior Treatments

A new pump was proposed to "eliminate rust color of the fountain and messy condition of fountain pool" in 1977.[41]

Existing Conditions

The fountain appears to be in good repair.

GLASS SCREENS / ESPALIER FRAMES

Design and Construction History

Two glazed steel, approximately six-foot-tall espalier screens were located in the Gardens. A screen of nine staggered panels is located east of the House, perpendicular to the Entry Drive and screening access to the Service Drive. Another screen, of five staggered panels, is located near the eastern edge of the Adult Garden. It functioned to screen drying laundry and kitchen garden beds from view.

According to drawings produced by Kiley, the walls were intended to support espaliered pear trees (see Fig. 63, BCA report).[42] The glass is dimpled and the panels are set in two staggered rows (Fig. 62, BCA Report). Galvanized wire was hung across the panels to control the branches; some of this wire is still present at the north set.

Prior Treatments

Espaliered pear trees were removed from Entry Drive screen at some unknown date. Otherwise no prior treatments are known.

Existing Conditions

The most common condition noted was failure of paint and sealant, sometimes accompanied by corrosion of the substrate (Fig. 64). One glazing unit is missing in the Adult Garden screen, reportedly due to the glass's shattering on impact with an object thrown from a lawnmower (Fig. 65, BCA report). There is also significant organic growth on both the metal and glass.

The screen in the service yard is missing one glass panel.

STEPS CONNECTING HONEY LOCUST ALLÉE TO MEADOW

Design and Construction History

A long run of shallow, concrete steps was included in the original design to connect the southern plaza of the Honey Locust Allée to the lower level of the Meadow.

Prior Treatments

None known.

Existing Conditions

The roots of the first (eastern-most) maple in the Allée along the Meadow's southern margin have compromised the accessibility and integrity of the adjacent steps leading up to the South Plaza and Honey Locust Allée. The roots present a tripping hazard immediately next to the lowest step and are beginning to encroach on the concrete steps themselves.

Fig. 7.10.5 Glass and metal espalier screens between Entry Drive and Service Drive. Date: 2021. Photo credit: PennPraxis/RM.

PLAZAS/PLINTHS OF THE HONEY LOCUST ALLÉE

Design and Construction History

Kiley's completed design indicated no plaza on the north end of the Honey Locust Allée; some planting plans indicate a flat, finely gridded square.[43] The plaza he designed on the southern end featured a small pool and fountain, located slightly off-center, and a grid of paving and flowers/ferns.[44] Later elaborations of plazas at both ends of the Honey Locust Allée departed from the original plan while reinforcing the powerful—soon to be iconic—presence of the Honey Locust Allée in the whole design. The central place of the Honey Locust Allée was reinforced by later decisions by the Millers to feature outdoor sculptures by well-known artists in these spaces.

The two large sculptures by prominent artists Moore and Lipchitz placed on the north and southern plazas were not original to the landscape design. The Henry Moore sculpture, placed in 1971, became an iconic element, exemplifying another dimension of the MH&G landscape's evolution and resilience.

Prior Treatments

On the north, a stone platform was built consisting of thick (approximately two inches) Indiana limestone pavers, curbs, and built-in benches. A travertine slab was designed by Kevin Roche to hold Henry Moore's sculpture, *Draped Reclining Woman* (nicknamed "Henrietta"). Moore's figure was the focal point on axis with the Allée path. The Moore work, added in 1971, was "peripheral to Kiley's intent," and removed in 2008 to be sold at auction by the Miller family.[45] The current stone bench on the North Plaza was the one used here pre-Henrietta.[46]

To the south, a somewhat larger plaza centers a square pool with bubblers on the Allée's axis; a freestanding concrete wall terminating the view south on the Allée once held Jacques Lipchitz's bas relief sculpture *Man With Guitar*. Fasteners and differential staining of the concrete wall present evidence of the missing sculpture. Closely associated with XSM, and of very different character than the plaza at the northern end, the South Plaza is varied, practical, and tactile. This area has extensive hosta groundcover with an alternating grid of begonia, mosses, and concrete pavers, accented with many stone sculptures of animal figures collected by XSM.

The Moore and Lipchitz sculptures were sold by the Miller family, so both plazas were missing their iconic (and often-photographed) sculptures when IMA took ownership and management responsibility for the Garden in 2009. This has been one of the most visible changes to the MH&G.

Existing Conditions

The North Plaza has settling and stone cracking failures; root growth of nearby honey locusts continue to cause heave problems with the stone plaza.

There is widespread displacement of units (Figure 74, BCA report), most evident at the curb along the edge of the platform (Figure 75, BCA report). These units were typically rotated away from the main platform, particularly at the west side. All joints between stone units are open, possibly due to soil subsidence and/or the action of roots from nearby trees. It is likely that water and other material is washing into the openings and jacking the units even farther apart. In addition to displacement, small cracks and losses were noted in isolated locations (Figure 76, BCA report). The rubber handicap access mat under the crushed stone on the east margin is displaced and needs re-setting. One large crack was noted in the bench (Figure 77, BCA report). Other conditions are limited to general soiling and organic growth.

The South Plaza wall bears damage from removal of the Lipchitz sculpture. Very few cracks and repairs in concrete pavers and curbs were also evident (see BCA report).

Fig. 7.10.6 Henry Moore's sculpture Draped Reclining Woman at the north end of the Honey Locust Allée. Date: n.d. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00410

Fig. 7.10.7 Jacques Lipchitz' Man With Guitar at the south end of the Honey Locust Allée. Date: n.d. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-0040

Fig. 7.10.8 North plaza of Honey Locust Allée, former site of Henry Moore sculpture. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.10.9 North plaza of Honey Locust Allée, former site of Henry Moore sculpture. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.10.10 South plaza of Honey Locust Allée, former site of Jacques Lipchitz sculpture. Date: 2021. Photo credit: PennPraxis/RM.

Fig. 7.10.11 South plaza of Honey Locust Allée, looking west toward maple allée. Date: 2021. Photo credit: PennPraxis/RM.

7.11 ENDNOTES

[1] The term "rooms" is applied to Kiley's design in the NHL nomination, 2000 (pp 6, 10, 12). Landscape historian Marc Trieb described Kiley "creating outdoor units" in "Dan Kiley and Classical Modernism: Mies in Leaf," *Landscape Journal*, Vol. 24, No. 1 (2005), 5.
[2] Kiley and Amidon, 1999, p.12.
[3] Joseph Disponzio, "Introduction: A New England Yankee in an Internationalist Court," in *Daniel Urban Kiley: The Early Gardens: Landscape Views 2*, ed. William S. Saunders (New York: Princeton Architectural Press, 1999), 7-16; Gary R. Hilderbrand, "Dan Kiley's Miller Garden: Coming to Light," in *Daniel Urban Kiley: The Early Gardens: Landscape Views 2,* ed. William S. Saunders (New York: Princeton Architectural Press, 1999), 65-77.
[4] Korab's photographs of the landscape and buildings are accessible through the Library of Congress; see Balthazar Korab Collection, Library of Congress Prints and Photographs Division, Washington, D.C., https://www.loc.gov/item/2011645089/. Stoller's photographs can be sampled in the ESTO archive and a small portfolio is presented in Hilderbrand's book *The Miller Garden: Icon of Modernism*); see Ezra Stoller, Esto Photographics archive, Esto Stock, https://www.estostock.com/; and Gary R. Hilderbrand, *The Miller Garden: Icon of Modernism*, Landmarks 09 (Washington, D.C.: Spacemaker Press, 1999), 5-11. Alan Ward's photographs of the landscape are also featured in The Miller Garden: Icon of Modernism; see Hilderbrand, *The Miller Garden,* 39-64.
[5] Kiley's first letter to the Millers, on June 18, 1955, noted his plan to make a "Blooming Chart" aligned to the Millers' planned annual absences; see Dan Kiley to J. Irwin Miller, letter, June 18, 1955, MHG Ia B001 f002 014, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields. For references to Ontario and Florida houses, see Nancy Kriplen, *J. Irwin Miller: The Shaping of an American Town* (Bloomington, IN: Indiana University Press, 2019).
[6] For instance, the 1963 letter from Henry Arnold of Kiley's office to XSM addressing dying ivy and hedges; see May 7, 1963 letter from Henry F. Arnold to Xenia S. Miller, MHG_Ia_B003_f019_001-002, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields. Or more recently, the February 17, 2009 correspondence between Michael Van Valkenburgh Associates and Irwin Management discussing replacement of magnolias; see Sheila Behrman, Michael Van Valkenburgh Associates, and Engledow, email exchange, February 17, 2009, MHG Ib B020 f219 028-030, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[7] Correspondence in Newfields Archives confirms details of the 1985-86 replacement of redbuds and other trees. For instance, see Owen Hungerford, Jack Curtis, Xenia S. Miller, and J. Irwin Miller, correspondence, March 13-14, 1986, MHG Ib B022 F234 014-016, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[8] The core plan, Fig 7.1.1, shows 42 in the north and 34 in the south.
[9] Hilderbrand, *The Miller Garden*, 33.
[10] Beverly McDermott to the Millers, MHG_IB_B023_F242_003, Newfields archives.
[11] Sept 28, 1978 note on purchase of fountain in Rome, MHG_Ib_B006_f050_012 ; JIM to Girard, Box 6 Folder 50, Miller House and Garden Collection (M003), Newfields Archives.
[12] Alluded to in letter from Michael Brown to J. Irwin Miller, August 5, 1958, MHG Ia B002 f010 074-076, Miller House and Garden Collection (M003), Newfields Archives.
[13] See Timeline, Section 3.9, and letter cited in note 12.
[14] Jack Curis & Associates, 4.10.86, MHG_IIIb_FF058_021, Miller House and Garden Collection (M003), Newfields Archives; Gregg Bleam, "Dan Kiley: Planting the Grid," in *Preserving Modern Landscape Architecture II: Making Postwar Landscapes Visible*, ed. Charles A. Birnbaum with Jane Brown Gillette and Nancy Slade (Washington, D.C.: Spacemaker Press, 2004), 74.
[15] Hilderbrand, *The Miller Garden*, 33; Bleam, "Planting the Grid," 74.
[16] See note 12.
[17] Hilderbrand, *The Miller Garden*, 33.
[18] Kiley and Amidon, *Dan Kiley: The Complete Works*, 20-27.
[19] Dan Kiley to J. Irwin Miller, letter, September 2, 1956, MHG Ia B001 f003 015, Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[20] Newfields, Historic Preservation Policy, September 18, 2017, Newfields.
[21] Hilderbrand, 33.
[22] Kiley and Amidon, *Dan Kiley: The Complete Works*, 24.
[23] See Timeline, 3.9.
[24] See Jack Curtis-related correspondence and reports Newfields Archives, including (for instance) March 18, 1986, Observation Report, MHG Ib B022 F234 003-004, in Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.
[25] Kiley to Miller, 18 June 1955, Newfields Archives.
[26] Dan Kiley, "Lecture," in *Dan Kiley Landscapes: The Poetry of Space,* eds. Reuben M. Rainey and Marc Treib (Richmond, CA: William Stout Publishers, 2009), 26.
[27] See 1953 pre-construction topographical survey, included as Figure 3L1 MH003 (unprocessed), Miller House and Garden Collection, Newfields Archives.
[28] Kiley to Hungerford, August 14, 1981, Miller House and Garden Collection, Newfields Archives.
[29] See Timeline, Section 3.9.
[30] Jonathan Wright, personal communication, June 3, 2021. The architecture firm SO-IL created the Exhibit Columbus project that donated the arborvitaes: http://so-il.org/projects/into-the-hedge.
[31] See Timeline, Section 3.9.
[32] Jean-Luc Howell, personal communication, June 17, 2022.
[33] Jonathan Wright, personal communication, June 3, 2021; Jean-Luc Howell, personal communication, June 17, 2022.
[34] Hilderbrand, *The Miller Garden*, 18-19.
[35] Jonathan Wright, personal communication, June 3, 2021.
[36] See Timeline, Section 3.9.
[37] Ben Wever, personal communication, June 1, 2021.
[38] Emails from Shelley Selim, May 17 and June 1, 2022.
[39] JIM to Girard, November 8, 1957, MHG Ia B001 f007 093, Newfields Archives.
[40] Girard, Jully 5, 1978, MHG IIIb FF058 007-008, Newfields Archives.
[41] A September 28, 1978, handwritten note remarks on purchase of the fountain pedestal in Rome, MHG Ib B006 f050 012, Newfields Archives.
[42] Hungerford to XSM and JIM, August 9, 1977, MHG Ia B003 f020 062, Newfields Archives
[43] Miller House Planting Plan, 1957-08-16, MHG_IIIb_FF056_003-004.
[44] Miller House Planting Plan, 1957-09-06, MHG_IIIb_FF056_017
[45] See Timeline, Section 3.9; Kiley in Rainey & Treib 2009
[46] Per Ben Wever, the bench was found in the Barn and re-placed, personal communication, June 1, 2021.

8
Understanding the Interiors and Collections

8 UNDERSTANDING THE INTERIORS AND COLLECTIONS

8.1 METHODOLOGY AND INTRODUCTION

Methodology

The Miller House and Garden (MH&G) represents a continuum of design, encompassing landscape, architecture, and remarkable interiors. Typically, architecture is the focus of Conservation Management Plans (CMPs), Historic Structure Reports, and other planning documents associated with historic sites. That encompasses only the components that are fixed in place—on the interior, that would include flooring, paneling, fireplaces, etc. It rarely includes elements that are moveable, such as carpets, chairs, window treatments, and artwork, since they are easily removed. In museums, and at the MH&G, these objects are also typically considered part of the collection.

At the Miller House, the furnishings are essential to the way that the site is understood and experienced, not to mention the way that it was designed. The Miller family and Newfields have recognized this importance, preserving most of the furnishings in their original locations and with original fabrics or reproductions of them. Therefore, the MH&G CMP has characterized the interior and collections as integral with the significance of the site. This section outlines the history, significance and evolution of the interiors and furnishings, and identifies the following as character-defining elements (CDEs):

- Key furniture and demountable lighting fixtures
- Window treatments
- Carpets and moveable floor treatments
- Fine and decorative artworks
- Color scheme

Section 6 identified portions of the building—including the Storage Wall and Conversation Pit—that could technically be classified as "interiors." As a distinction, this section covers all interior elements that are *moveable*. The Miller House contains thousands of objects sourced by Girard, and while all are relevant to the overall experience of the home, an exhaustive list is beyond the scope of this study, as is a detailed assessment of their conditions. For the Collections CDEs, this CMP emphasizes customized, one-of-a-kind artworks and furniture, particularly those designed and/or adapted by Alexander Girard, Saarinen, and Giancarlo "Tunsi" Girard. Pieces that appear prominently and repeatedly in historic photography of the home are also included.

Introduction

Girard and Saarinen were hired at the same time to design the Miller House and worked together much like they did at Llanrwst—closely, and with sometimes blurred boundaries between architect and interior designer. *House and Garden's* 1959 feature on the MH&G credits the architecture to both Saarinen and Girard. The Conversation Pit has been attributed to Girard, but both designers incorporated sunken lounge spaces in previously designed residences (Entenza House, Saarinen and Charles Eames, 1949; Rieveschl Residence, Girard, 1951).[1] The built-in storage wall, as noted earlier, was the brainchild of Girard, while the custom Dining Room Table was designed by Saarinen.

Overall, however, Saarinen concerned himself with the structure of the home, believing buildings had become "'completely anonymous shells. And thank God this is so!'"[2] He considered some interior elements, particularly those that defined spaces, to build the "structure" of the interior. Of the relationship between architecture and interiors, he stated:

> Most people want to create for themselves not only an orderly 20th-century environment but they want also to make an environment which is an expression of their personal identities. I would like to state very strongly that I do not see any conflict between these desires—on the one hand, for a truly 20th-century environment which accepts in full the impersonality of both setting and furnishing and, on the other, the desire for a truly personal expression in the interior. I believe there can be a very beautiful result when the interior reflects both desires without compromising one or the other. The virtually mass-produced walls, spaces, and furniture must never lose their impersonal character: they are to the interior as structure is to architecture. But playing against them are what we can call ornamental or non-structural elements.

> These are such objects as paintings and sculptures, flowers, vases, heirlooms, books, legitimately handicraft objects from travel or exotic parts of the world or the past, and so on. They may be small in volume and small in number, but they assume significance and strength in the impersonal, noncommittal setting. They stand out like oases in the desert. They express the personality and establish the identity of the owners.[3]

In a later interview, J. Irwin Miller (JIM) recalled a conversation with Saarinen that echoed that sentiment: "[Xenia Simons Miller (XSM)] once said to Eero, 'I don't want to live in the same house for the rest of my life—what are you going to do about that?' He said, 'I'm going to build a structure of neutral color, and all the color is going to go into the drapes and furnishings. Any time you want a new house you can throw them away and start all over again.'"[4] Girard, who JIM called a "master of color," was enlisted to work with XSM on the color scheme of the home, and sourced or made all its most beloved furnishings, objects, and artworks.[5]

Girard welcomed a holistic approach to architecture and interiors, in contrast to the more typical separation of responsibilities. In a 1962 interview for *Progressive Architecture* addressing the state of the field of interior design, he opined,

> Since it is impossible to conceive of an architecture (a space-enclosing structure) as existing without an interior space, one cannot then think of 'interior design' or interior space as a separate activity disconnected from architecture. No arbitrary dividing line may be drawn between the structure and its component parts. The nature and design of each, however diverse in material or use, small or large, contribute their proportionate share to the nature and design of the whole.[6]

When asked later in the issue why he practiced interior design while identifying as an architect, he responded simply, "Because it is my job."[7] Yet interiors were, arguably, where Girard demonstrated his greatest talents. Along with his textile designs, his gifts for inspired color schemes, collecting folk art objects, and devising masterful systems for their display are the most abiding aspects of his legacy. Folk art was a lifelong source of passion and inspiration for Girard, as evidenced by his personal collection which ultimately grew to over 100,000 objects.[8] He wrote of its personal significance in an exhibition catalogue for *The Magic of a People*, a display of his collection at the 1968 HemisFair World's Fair in San Antonio, Texas:

> We can, and I firmly believe we should, preserve evidence of the past, not as a pattern for sentimental imitation, but as nourishment for the creative spirit of the present, so that we too may evolve customs and shape objects of equivalent value in our own way, in our own time, taking advantage of the many new methods and materials at our disposal. In this way we will neither ignore nor forget the spirit of individuals who have died, the spirit of a people. We will remember them by their unique voices, which echo still out of their creations, and we will be inspired by them.[9]

Before he was hired by the Millers, Girard had incorporated folk art displays in his own home and the Rieveschl House (1952) in Grosse Pointe, Michigan. The Rieveschls were also collectors and made many purchases of folk art while traveling with Girard and his wife.[10] The presentation of these collections—often in rectangular modules or grids—was integral to Girard's interiors, providing key points of visual interest that contributed to the carefully composed layers of color, pattern, and texture in the home. A critic for *House & Home* observed:

> Girard is tremendously interested in details—the smaller the better—so that the fleeting glances ...are points of interest along your way, small enough for the human eye to take in, and placed by a designer who knows better than most how to keep the observer interested and amused.... [T]he plethora of wonderful, small-scale 'junk' with which Girard litters (and lets his clients litter) the interiors of his houses gives them that special atmosphere that makes people want to spend relaxed hours browsing around in antique shops all over the world.[11]

For his clients, Girard operated as a kind of twentieth-century *marchand-mercier,* sourcing *objects d'art* but also adapting existing pieces into entirely new and unique compositions.[12] He worked with the Millers—particularly XSM—to amass an impressive collection of furniture, textiles, and international folk art which is of integral importance to the aesthetic experience of the MH&G. These items were

carefully arranged within a series of defined modules—discussed in Section 3.1—which delineated the interior spaces and built upon the grid established by Saarinen. Rugs and furniture were placed to define distinct spaces and infuse the beige floors and white marble walls with controlled flourishes of analogous and complementary colors that, as Saarinen noted, "stand out like oases in the desert" and "express the personality and establish the identity of the owners."[14]

Many of the custom pieces Girard designed for the home—including the *Den Rug*, *Dining Room Seat Cushions*, and the *Cross*—reflect the family identity and Girard's personal friendship with the Millers. The *Dining Room Table*, *Centerpieces*, *Dining Room* and *Den Divider Curtains*, and *Dollhouse* are testaments to the designer's penchant for theatricality, while the careful selection of objects for the Storage Wall, illuminated or placed against paper and fabric backdrops, recall his expertise in exhibition design. The MH&G is undoubtedly the greatest extant example of Girard's unique ability to imbue Modernist interiors with humanity, personality, charm, and sentimentality; to send the message that, as curator Charlene Cerny posited:

> [Z]est, informality, spontaneity, and celebration may all be elements of a well-integrated interior. His designs somehow affirm that people, their lives, and their emotions count. Girard's lively, personal, and expressive style represents a radical departure from the cool and often over-intellectualized one that often prevails in modern architecture.[15]

Of Girard's indelible contributions to the MH&G, Kevin Roche recalled, "He had great sensitivity to the art of living in a house with a family, and he expressed it by bringing all of his stuff along and implanting it. But it was very livable stuff. He made [the Miller House] a home."[16]

8.2 COLOR SCHEME

8.2.1 FLOOR PLAN WITH MATERIAL SAMPLES, ALEXANDER GIRARD, 1954–1955
(MHG IIIa FF045 001)

Alexander Girard's floor plan with textile samples (Fig. 8.2.1.1) provides valuable insight into his overall color scheme for the home and how it evolved over time. It also illustrates his methodology for infusing vibrant color into carefully contained sectors. Seasonal rotation of the Conversation Pit pillows was planned early on, emphasizing deep red, violet, and orange hues for winter, and lighter, striped fabrics for the spring and summer months. The cooler shade of the Kitchen color scheme is present, although the swatch for the curtains is lost, and the addition of the *Eden* curtains in 1969 unified the blue/green tonalities in the room significantly. Overall, Girard chose bolder colors for the Living Room and the family's bedrooms, while the Den, Guest Room, and Maid's Room were more subdued.

8.3 DINING ROOM

8.3.1 DINING ROOM DIVIDER CURTAIN, INDIAN, 1979
(MH2010.298)

The *Dining Room Divider Curtain* functions as an important spatial boundary between the Living and Dining Rooms, providing privacy to staff when preparing the table during special events. It is motor operated, revealing the Dining Room to dramatic effect for guests convened in the Living Room before a meal.

The original curtain fabric was a sheer gold and brown printed Indian muslin, sourced by Girard from Bombay.[17] It was replaced with similar or possibly identical fabric in 1968.[18] In 1978, a new sheer floral fabric was sourced in Bombay, India, by the wife of a colleague based there who had visited the Millers at their home earlier that year.[19] The curtain was fabricated in 1979 by LoNano.[20] The motor is currently operational but is rarely used.

Fig. 8.2.1.1 Miller House Floor Plan on Board with Attached Material Samples of Fabrics, Rugs by Alexander Girard (annotated). Date: 1954/1955. Photo credit: Newfields.

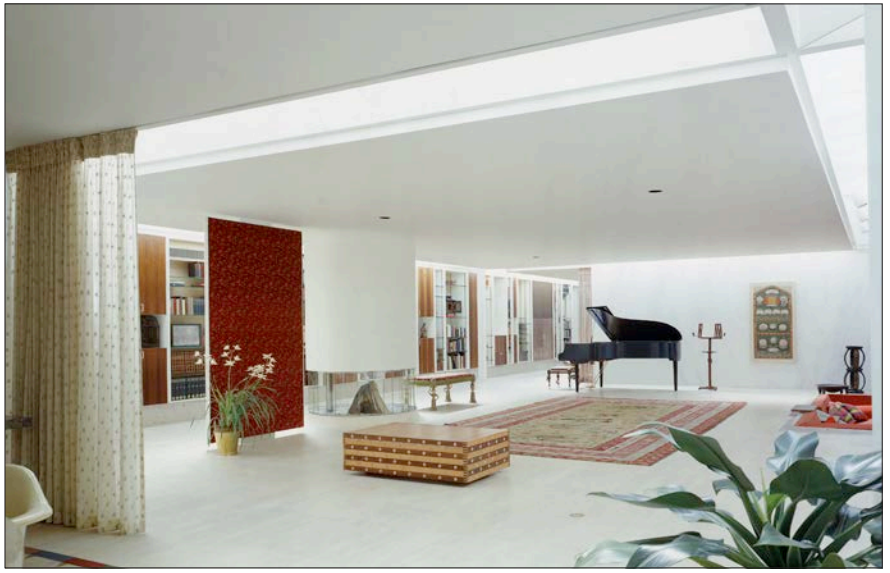


Fig. 8.3.1.2 Dining and Living Rooms featuring original Dining Room Divider Curtain. Date: 1958. Photo credit: © Ezra Stoller / Esto, 27T.013C

Fig. 8.3.1.1 Dining Room Divider Curtain. Date: c. 2010. Photo credit: Newfields.

8.3.2 DINING ROOM TABLE, EERO SAARINEN, 1957 (MH2010.55)

The *Dining Room Table* (Fig. 8.3.2.1) features a marble top and terrazzo base and is mounted directly to the floor. A fountain mechanism in the base filled the central bowl with water, which is protected by a removable glass cover that sits flush with table surface. Historic images indicate the Millers would fill the bowl with water and float flowers on its surface (Fig. 8.3.2.4). The base illuminates and a call button under XSM's seat (no longer operational) paged the kitchen staff.

The table resembles Saarinen's "Tulip" Pedestal furniture series, which was released by Knoll in 1958. It also appears to draw inspiration from the dining table designed by Saarinen's father, Eliel, for Saarinen House in Bloomfield Hills, Michigan. It was one of the earliest furnishings designed for the home, with initial sketches being sent to the Millers in 1955 (Fig. 8.3.2.2). The marble top and terrazzo for the base arrived at the house in 1956.[21] The fountain experienced leakage over the years and is no longer operational.

Fig. 8.3.2.1 Eero Saarinen, Dining Room Table, 1957, marble, terrazzo, steel, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.55, © Eero Saarinen. Date: 2012. Photo credit: Newfields.

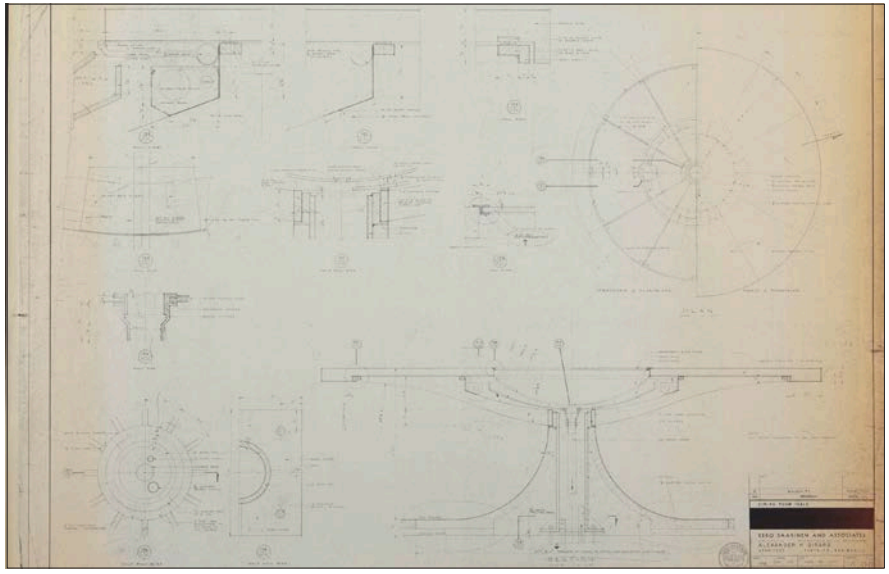


Fig. 8.3.2.2 Miller House Dining Room Table (A-11), blueline from Eero Saarinen & Assoc. and Alexander Girard. Date: July 8, 1955. Photo credit: MHG IIIa FF042 004, Miller House and Garden Collection (M003), Newfields Archives

Fig. 8.3.2.3 Dining Room featuring Eero Saarinen's Dining Room Table. Date: 1958 Photo credit: © Ezra Stoller / Esto, 27T.007C

Fig. 8.3.2.4 Dining Room featuring Eero Saarinen's Dining Room Table. Date: after 1969[22] . Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00378

8.3.3 POLIEDRI CHANDELIER, VENINI, C. 1958
(MH2010.205)

The *Poliedri Chandelier* was originally purchased by the Millers during a trip to Venice in 1960. While often attributed to Carlo Scarpa, according to Roberto Gasparotto, Venini's Art Director, the *Poliedri Chandelier* was designed collaboratively within Venini; that is, there is no single designer to whom the chandelier may be attributed.[23]

8.3.4 DINING ROOM CHAIRS, EERO SAARINEN, DESIGNED 1957
(MH2010.53.1A-.6A, MH2010.54.1A-.6A)

Girard originally ordered ten DAR-1 chairs and four DSR-1 chairs designed by Charles and Ray Eames with beige leather upholstery and Eiffel Tower bases for the Dining Room (Fig. 8.3.2.3).[24] They were replaced in 1961 with six armchairs and six side chairs from Saarinen's Pedestal line for Knoll Furniture Company, which harmonized much more successfully with the base of the *Dining Room Table*.[25] Saarinen famously said of the Pedestal series, "The undercarriage of chairs and tables in a typical interior makes an ugly, confusing, unrestful world. I wanted to clear up the slum of legs. I wanted to make the chair all one thing again."[26] JIM later recalled of the switch, "First we had the Eames chairs with wire bases and it was forest of legs. So Eero at that time went to the pedestal, which is where this design came from. It's because we complained so much—we were good at complaining."[27] Saarinen designed the Pedestal series from 1954–1957, so this timeline makes JIM's claim unlikely.[28]

The chairs were most recently replaced in 1973, and in the early 1980s a representative from Irwin Management Company wrote to Knoll to request replacement bolts, washers, lock washers, and plastic rings for some of the chairs, which by then had been out of production for some time. Knoll sent the parts they still had remaining in storage.[29]

Fig. 8.3.3.1 Venini, Poliedri Chandelier, c. 1958, glass and metal, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.205, © Paolo Venini. Date: 2012. Photo credit: Newfields.

Fig. 8.3.3.2 Dining Room featuring the Venini Poliedri Chandelier. Date: after 1969. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00379

Fig. 8.3.4.1 Eero Saarinen Pedestal Armchair, designed 1958, fiberglass and aluminum, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.53.1A, © Eero Saarinen. Date: c. 2010. Photo credit: Newfields.

Fig. 8.3.4.2 Eero Saarinen Pedestal Side Chair, designed 1958, fiberglass and aluminum, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.54.1A, © Eero Saarinen.Date: c. 2010. Photo credit: Newfields.

8.3.5 DINING ROOM SEAT CUSHIONS, ALEXANDER GIRARD, 1974–76 (MH2010.53.1B-.6B, MH2010.54.1B-.6B)

At XSM's request, Girard designed twelve custom seat cushions for the Saarinen pedestal chairs around the dining table—the original design drawings are in Newfields Archives.[30] (Fig. 8.3.5.3) Originally, Girard sent fabric samples to the Millers for their approval, but XSM responded, "None looks well in there.... I would like seats which are colorful—with many colors—so that they would go with many different colors of table mats—not like an office, for which these samples would be ideal."[31] In minutes from a meeting with Girard in September 1973, William Chambers wrote:

> Saarinen Chairs - XSM has a magazine clipping that shows what she wants.
> a. Neutral fabric for seat cushions (see number 14 below)
> Then
> b. Get needlepoint "slip covers" maybe through Treganowan (Hong Kong). AHG will design.[32]

Based on this feedback, Girard sent XSM the same design for six armchairs and six side chairs in March of 1974, accompanied by fifteen color samples for the wool needlework—seven neutrals and eight bright colors. He emphasized that each cushion having the same overall "scrambled" pattern would lower production costs, and noted that he would begin to reach out to fabricators for estimates.[33] By the following month, Girard had issued an invoice to Irwin Management Company for "Design for 8 Needlepoint Cushions with Individual Monograms," indicating that XSM likely approved his initial design for the guest chairs but requested personalized cushions for the family members.[34] To save production costs, XSM and her bridge club executed the needlework. The cushions were fabricated by Knoll and sent to the Millers in early 1976, and Custom Shop in Columbus created covers from the homemade needlework.[35] Four cushions were designed for the side chairs which adhere to Girard's multicolor grid pattern. Eight cushions (six for armchairs and two for side chairs) bear the initials of the following Miller family members:[36]

XSM: Xenia Simons Miller
JIM: J. Irwin Miller
ECM: Elizabeth Ann Garr Miller
WIM: William Irwin Miller
HTMII: Hugh Thomas Miller II
MIM: Margaret Irwin Miller
CGM: Catherine Gibbs Miller
LAM: Linda Anderson Miller (HTMII's first wife)

Fig. 8.3.5.1 Girard Seat Cushion, c. 1974, textile, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.53.1B, © Alexander Hayden Girard. Date: c. 2008. Photo credit: Newfields.

Fig. 8.3.5.2 Alexander Girard, Seat Cushion, designed 1974 Date: After 1975. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00381

Fig. 8.3.5.3 Needlepoint chair cushion pattern #1 Xenia S. Miller by Alexander Girard, Date: 1974. Photo credit: MHG_IIIc_FF061_002, Miller House and Garden Collection (M003), Newfields Archives

Fig. 8.3.5.4 XSM with the "JIM" Seat Cushion needlepoint project. Date: c. 1974. Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

8.3.6 DINING ROOM RUG, ALEXANDER GIRARD, DESIGNED 1957; PRODUCED 1986
(MH2010.401)

The first version of the *Dining Room Rug* was a flat-weave rug and was replaced three times over the years (see figs. 8.3.2.3 and 8.3.2.4).[37] This version was produced in 1986 by Treganowan and is a looped-pile type. The colorful, geometric designs around the table edge are denser than the outer areas to disguise food stains—a request of JIM.[38] The pattern also reflects some of the design elements of the House, particularly the cruciform shape of the columns and the gates leading to the Adult Garden.

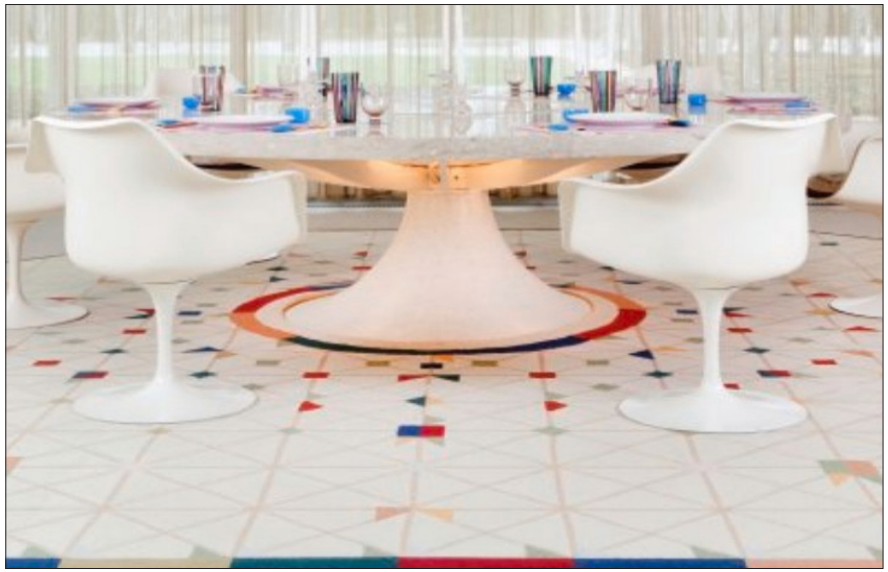


Fig. 8.3.6.1 Alexander Girard, Dining Room Rug, designed 1957 (rewoven 1986), wool, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.401© Alexander Hayden Girard. Date: 2012 Photo credit: Newfields.

8.4 ENTRYWAY

8.4.1 "ONE TO FORTY-NINE," ALEXANDER GIRARD, 1968
(MH2010.3)

An original artwork by Alexander Girard, this shadowbox display features seeds, feathers, beans, and wood encased within 49 compartments. It takes its name from the number of elements in each compartment—one shell in the upper left corner, 49 seeds in the lower right. Its concept likely derives from Girard's early plan for furnishing the house, which divided the main floor into 49 spaces (see Fig. 8.2.1.1). A document in Newfields Archives indicates that "weevils" were removed in summer 1972.[39]

Fig. 8.4.1.1 Alexander Girard, One to Forty-Nine, 1968, beans, shells, feather, wood, glass, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.3 © Alexander Hayden Girard. Date: c. 2010 Photo credit: Newfields.

8.4.2 ENTRANCE HALL RUG, ALEXANDER GIRARD, DESIGNED 1956, RE-WOVEN 2014
(NON_ART_319)

The *Entrance Hall Rug* (Fig. 8.4.2.2) was designed in 1956 by Girard and originally was flat-woven in France in the Aubusson style. It was rewoven as a looped-pile rug in 1971 by Ernest Treganowan, Inc.[40] The current rug was rewoven by Edward Fields in 2014.

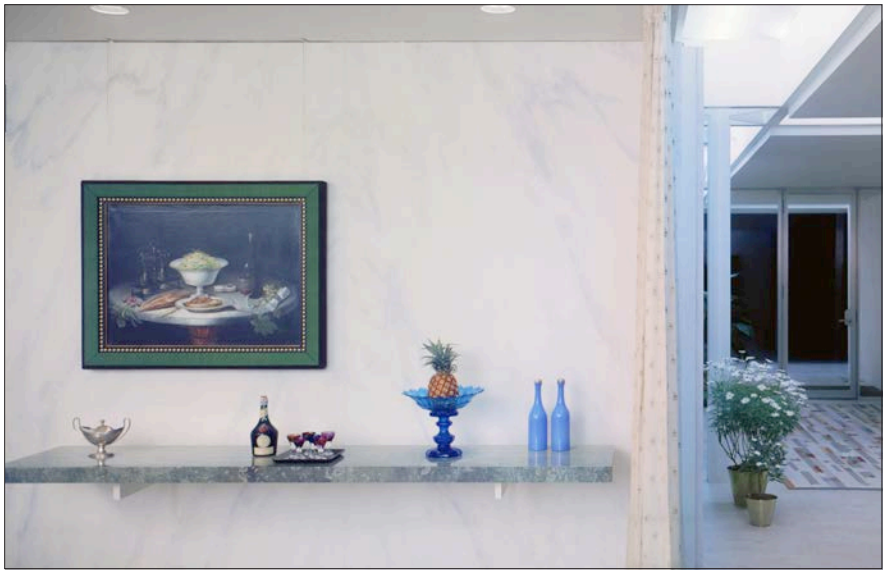


Fig. 8.4.2.1 Dining Room and Entryway featuring the Entrance Hall Rug. Date: 1958 Photo credit: © Ezra Stoller / Esto, 27T.009C

Fig. 8.4.2.2 Alexander Girard, Entrance Hall Rug, designed 1956, rewoven 2013, wool, Indianapolis Museum of Art at Newfields, NON_ART_318 © Alexander Hayden Girard. Date: c. 2013. Photo credit: Library of Congress, Prints & Photographs Division, photograph by Carol M.Highsmith, LC-DIG-highsm-41035.

8.5.1 BESSARABIAN RUG, 1900-1925
(MH2010.11)

This wool rug was likely woven in present-day Romania or Moldova. Shortly before travelling to New York to meet with the Millers, Girard wrote to JIM about the furnishing plan, noting, "As I mentioned to you earlier, my chief concern is to have a good foundation on which to start building your interior furnishings schemes. They best way of achieving this is to try and make decisions on rugs, so I think we probably should concentrate our attention in that direction."[45] This *Bessarabian Rug* was Girard's first acquisition for the home—purchased in 1955—and it guided the color scheme for much of the Living Room.[46]

8.5.2 CHEST, RICHARD RUSSELL, ABOUT 1957
(MH2010.5)

Writing to Alexander Girard in November 1957, JIM noted that he and XSM had visited Dick Russell at his home and had paid for the log box.[48] Although no information has been found to detail Girard's contact with Russell, they probably did correspond with one another since Girard billed the Millers for Russell's design fee.[49] It is therefore likely that this *Chest* was designed especially for the Millers' new home. The *Chest* was refinished in 1987 by Hubert Schuwey of Bittner's in Louisville.[50] There are two samples of wood in Newfields Archives. While it is situated several feet northwest of the Fireplace in the Ezra Stoller photographs (Fig. 8.3.1.2), it usually remained flush with the room screen, as exhibited in Balthazar Korab's photographs (Fig. 8.3.3.2).

8.5.3 LOW TABLE, ALEXANDER GIRARD, BASE IS FROM C. 1963; TABLETOP IS A GIRARD FAMILY HEIRLOOM, PROBABLY EARLY 20TH CENTURY
(MH2010.8)

Brass table bases are a unifying design element throughout the House, and Girard designed most, if not all, of them. In June 1963, XSM and Girard corresponded about the bases for this table and the rectangular table in the Living Room. The first inquiry was about refinishing the brass bases, but XSM eventually decided to have new bases designed.[51] n the 1975 Bittners Appraisal, a hand-written note after item "#517 Brass triangular table with inlaid Italian circular mosaic top" states: "Belonged once to Girard family."[52]

Fig. 8.5.1.1 Living Room featuring the Bessarabian Rug, Romanian or Moldovan, early 20th century, wool, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.11. Date: 2009. Photo credit: Newfields.

Fig. 8.5.1.3 Living Room featuring the Bessarabian Rug. Date: After 1979[47]. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00355

Fig. 8.5.1.2 Living Room featuring the Bessarabian Rug. Date: 1958. Photo credit: © Ezra Stoller / Esto, 27T.002C

Fig. 8.5.2.1 Richard Drew Russell, Chest, c. 1957, fruitwood, rosewood, stainless steel, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.5. Date: c. 2010. Photo credit: Newfields.

Fig. 8.5.3.1 Alexander Girard, Low Table, 1900–1965, marble, brass, various inlaid hardstones, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.8 © Alexander Hayden Girard. Date: c. 2010. Photo credit: Newfields.

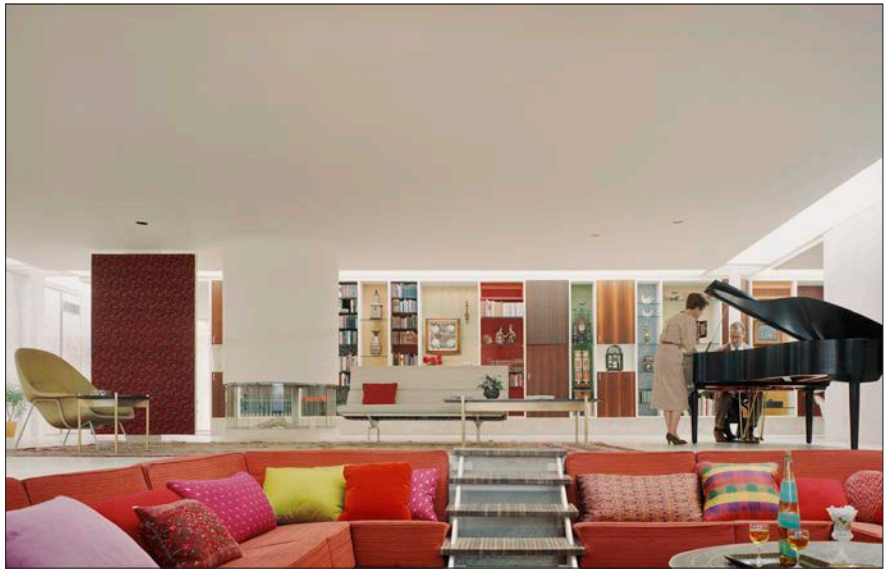


Fig. 8.5.3.2 Living Room featuring Alexander Girard's Low Table, center left. Date: 1958. Photo credit: © Ezra Stoller / Esto, 27T.005C

Fig. 8.5.4.1 Alexander Girard, Bench with Rajasthani-style Figures, c. 1957, wood, velvet upholstery, paint, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, © Alexander Hayden Girard. Date: C. 2010. Photo credit: Newfields.

Fig. 8.5.4.2 View of the Den and Living Room featuring Alexander Girard's Bench with Rajasthani-style Figures with original upholstery, center right. Date: 1958. Photo credit: © Ezra Stoller / Esto, 27T.006C

8.5.4 BENCH WITH RAJASTHANI-STYLE FIGURES, ALEXANDER GIRARD, C. 1957
(MH2010.10)

This bench was present in 1957 when construction of the House was completed. The legs were purchased first from the New York dealer George M. Juergens, and the bench was then designed and built.[54] The fabric originally used to cover the cushion was of Pakistani design. The current fabric is modern European flame stitch that imitates embroidery.[55] The bench has been recovered at least twice since it was made.[56]

8.5.5 STEINWAY AND SONS SKETCH 1111 MUSIC ROOM MODEL (MODEL B) PIANO, WALTER DORWIN TEAGUE, 1953-1957
(MH2010.13)

The size of this Steinway and Sons *Sketch 1111 Music Room Model* (Model B) piano (Fig. 8.5.6.1) was not standard when the Millers purchased it. As JIM had hoped, at seven feet in length it was smaller than a concert grand piano. In a letter to Girard in March of 1956, JIM wrote:

> I should like to have the first size just below the concert grand... . We have a large living room and I should like to take advantage of this to have a bigger tone piano than a fellow usually feels he can have in his private home. I think the concert grand at 8 [feet] 11 [inches] is too large and is out of proportion in the size of tone and physical dimensions to the room. However, the simplest model is their one known as "Contemporary" which, apparently, only comes in a 5 [feet] 7 [inches] length. It seems to me it would be best to have an ebonized piano, rather than any of the colored woods.[58]

In May of that year, he speculated that Steinway was considering production of a 7-foot piano in their "'Contemporary' style" and thus would be willing to make this piano for a regular price.[59] The brass lyre coordinates with the brass bases for the rest of the furniture in the home, and the underside was painted red to create a more pleasing view from the Conversation Pit.

8.5.6 PICHWAI WALL HANGING, INDIAN, 19TH CENTURY
(MH2010.31)

Pichwais are religious paintings that are typically hung behinds images of Krishna. This piece (Fig. 8.5.6.1) is comprised of several individual sections which are joined together into one larger piece—uncommon of most *pichwai*. It likely depicts the summer season due to the appearance of pink lotus on the ponds.[60]

Purchased by the Millers by 1955, it is an important early art acquisition in the home. This textile along with another from the Miller's collection was included in the 1955 exhibition *Textiles and Ornaments of India* at the Museum of Modern Art in New York, directed by Monroe Wheeler and designed by Alexander Girard.[61] It first hung in the Living Room next to the piano, was hanging in the Den in 1975, and was returned to the Living Room when the IMA acquired the MH&G.

8.5.7 DOLLHOUSE, ALEXANDER GIRARD AND GIANCARLO "TUNSI" GIRARD, 1955-1959
(MH2010.101A-SS)

The *Dollhouse* (Fig. 8.5.7.1, sometimes referred to as the "tower" in correspondence) was probably completed in early 1959.[62] The house was designed by Alexander Girard, and the ceramic figures and furniture for the interior were made by his brother, Giancarlo "Tunsi" Girard, a ceramicist and sculptor based in Florence, Italy. Most of the *Dollhouse's* construction was completed in Alexander Girard's office, and he came to Columbus to install it.[63] He visited Columbus in 1974 to refurbish it.[64] It is electrified, and the interior rooms illuminate.

Fig. 8.5.4.3 Living Room featuring Alexander Girard's Bench with Rajasthani-style Figures, lower left. Date: After 1987[57] Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00352

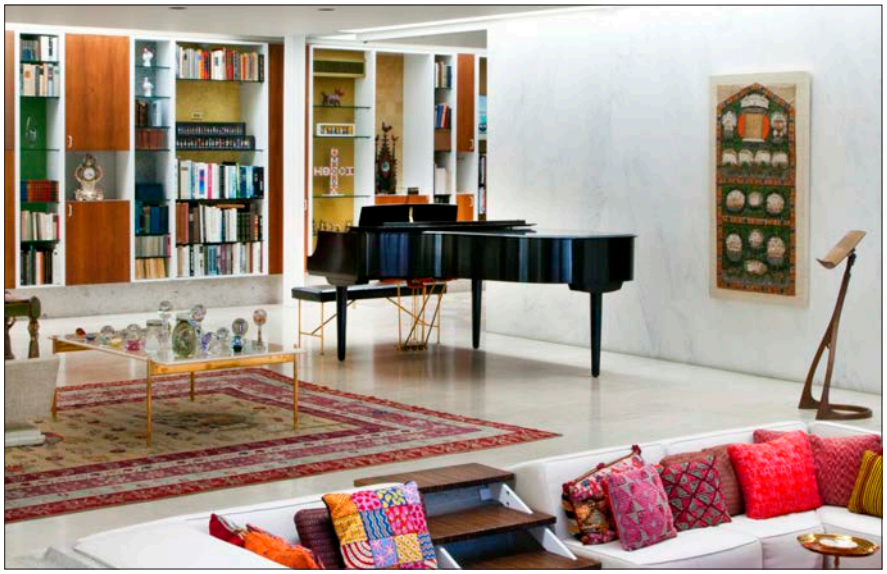


Fig. 8.5.5.2 Living Room featuring the Steinway and Sons Sketch 1111 Music Room Model (Model B) Piano. Date: 2010. Photo credit: Newfields.

Fig. 8.5.5.1 Walter Dorwin Teague for Steinway and Sons, Sketch 1111 Music Room Model (Model B) Piano, 1957, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.13. Date: c. 2010. Photo credit: Newfields.

Fig. 8.5.6.1 Pichwai Wall Hanging, Rajasthani, late nineteenth century, cotton, paint, and wood, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.31. Date: c. 2010. Photo credit: Newfields.

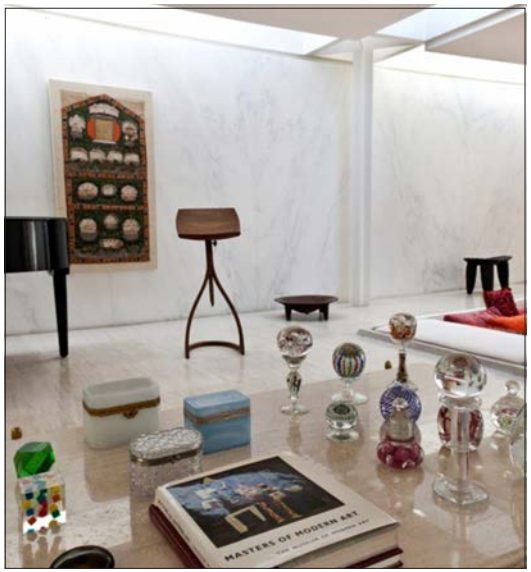


Fig. 8.5.6.2 Living Room featuring the Pichwai Wall Hanging, right of the piano. Date: 2009. Photo credit: Newfields.

Fig. 8.5.6.4 Den featuring the Pichwai Wall Hanging behind the sofa, slightly obscured from view. Date: c. 1975. Photo credit: Balthazar Korab Collection, Library of Congress Prints and Photographs Division, LC-DIG-krb-00384

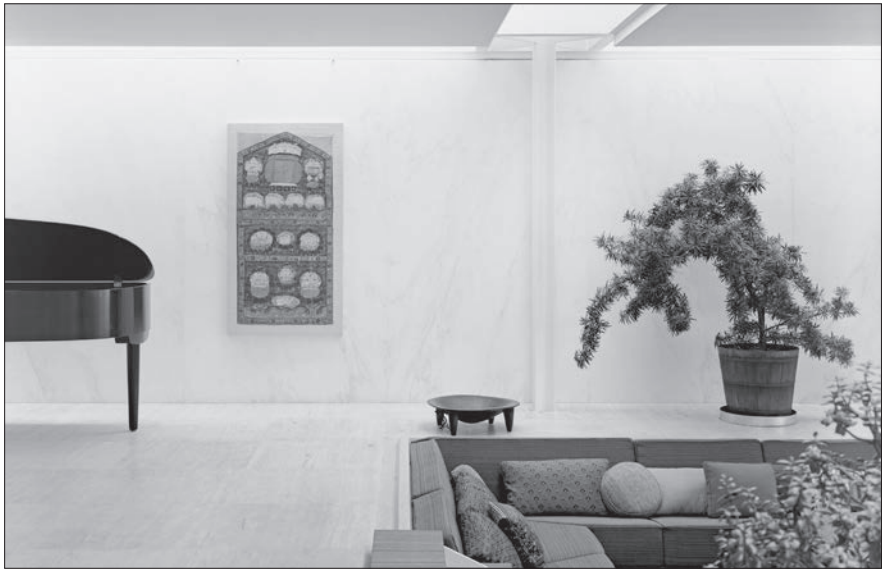


Fig. 8.5.6.3 Living Room featuring the Pichwai Wall Hanging, right of the piano. Date: 1958. Photo credit: © Ezra Stoller / Esto, 27T.004

Fig. 8.5.7.1 Alexander Girard and Giancarlo "Tunsi" Girard, Dollhouse, 1955–1959, wood, glass, earthenware, paper, paint, brass, Indianapolis Museum of Art at Newfields, MH2010.101A-SS © Alexander Hayden Girard and Giancarlo Girard. Date: 2009. Photo credit: Newfields.

Fig. 8.5.7.2 Living Room featuring the Alexander and Giancarlo "Tunsi" Girard Dollhouse, upper right. Date: After 1979[65]. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00355

Fig. 8.5.8.1 Alexander Girard, Charles Eames, and Ray Kaiser Eames, Custom Sofa Compact, 1961, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.7 © Alexander Hayden Girard and Charles and Ray Eames. Date: c. 2010. Photo credit: Newfields.

8.5.8 CUSTOM SOFA COMPACT, CHARLES AND RAY EAMES, ALEXANDER GIRARD, C. 1961 (COMPACT SOFA ORIGINALLY DESIGNED BY CHARLES AND RAY EAMES IN 1954)
(MH2010.7)

Alexander Girard wanted an Eames Compact Sofa in the Living Room, and indeed one was originally placed there when the house was first built. JIM and XSM, however, had reservations about it very early on. In December 1955, JIM wrote to Girard:

> We still are not genuinely sold and enthusiastic about the Eames sofa and our objections arise entirely from the appearance that it will present when viewed from the area of the pit. These objections are two in number:
>
> a. All the trigger work behind this sofa is not particularly attractive.
>
> b. The sofa is too high
>
> We agree that the sofa is most comfortable and is most handsome when viewed from the front, but it appears to us that it is at the best advantage when located near a wall, rather than when it stands free in the middle of the room.[66]

Girard responded the next week:

> The Eames sofa has been ordered. All the "trigger work" consisting of frame, normally black, and legs, normally chrome plated, has been ordered and changed to a light off-white for frame, and a darker beige shade for legs. See enclosed samples. The handwoven fabric that you approved at our last meeting (sample enclosed) is now in work, and to be used for covering the sofa. I do not know to what degree all these orders have progressed at this writing. Before stopping everything, I would like you and Xenia to reconsider your present conclusions on the sofa. I feel that when it is "doctored," as described above, it is going to look very different from the stiff Naugahyde upholstered black and chrome "trigger worked" jobs you have seen to date. Apart from the color changes, I have to fall back on my argument that (1) it would be better than anything else (that is, built closer to the floor type sofa) on the Bessarabian rug, not blotting out the rug where it sets; (2) it is a maximum contrast to,

and thereby not an offshoot of, or competing with, the very non-floating pit sofa; and (3) I really believe that the back height is not going to be a problem in the large space in which it is to be placed, and contrarily, with apologies, I feel the sofa is not necessarily better looking when backed up against a wall.[67]

Ultimately, the Millers relented. In January 1956, JIM responded, "With respect to the Eames Sofa, we give up. Let it come upholstered and painted as planned, with Girard wholly responsible for the consequences."[68] Later that month Girard replied, "Eames sofa makes me tremble in my boots."[69]

The custom sofa Girard ordered was originally placed in the Living Room, but ultimately JIM and XSM could not get past its obstruction of the view to the storage wall, and it was moved to the Entryway. This Custom Sofa Compact with a lower back height replaced it and was completed around 1961. It is difficult to establish who is responsible for the design and construction of this sofa, but it was likely Girard. From documents in Newfields Archives, it is clear that Eames supplied a sample sofa and Girard had the brass frame made and billed the Millers.[70] It was reupholstered in 1973.[71]

Fig. 8.5.8.2 Living Room featuring the Custom Sofa Compact, center left. Date: 2009 Photo credit: Newfields.

Fig. 8.5.8.3 Living Room featuring the Custom Sofa Compact, center. Date: After 1961. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00361

8.5.9 SHADOWBOX WITH FIGURES, ALEXANDER GIRARD, 19TH CENTURY (FIGURES); 1958 (BOX) (MH2010.87A-M)

The Millers purchased these Rajput figures (Fig. 8.5.9.1) in April 1958, and Girard built the box in August 1958.[72] In photographs taken for a 1961 issue of *LIFE Magazine*, the box is located on the floor just north of the Conversation Pit. It now lives on the Baker's Table next to the Dining Room (Fig. 8.5.9.2).

Fig. 8.5.9.1 Alexander Girard, Shadowbox with Rajput Figures, 1958, glass, paint, wood and brass, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.87A–M © Alexander Hayden Girard. Date: c. 2010. Photo credit: Newfields.

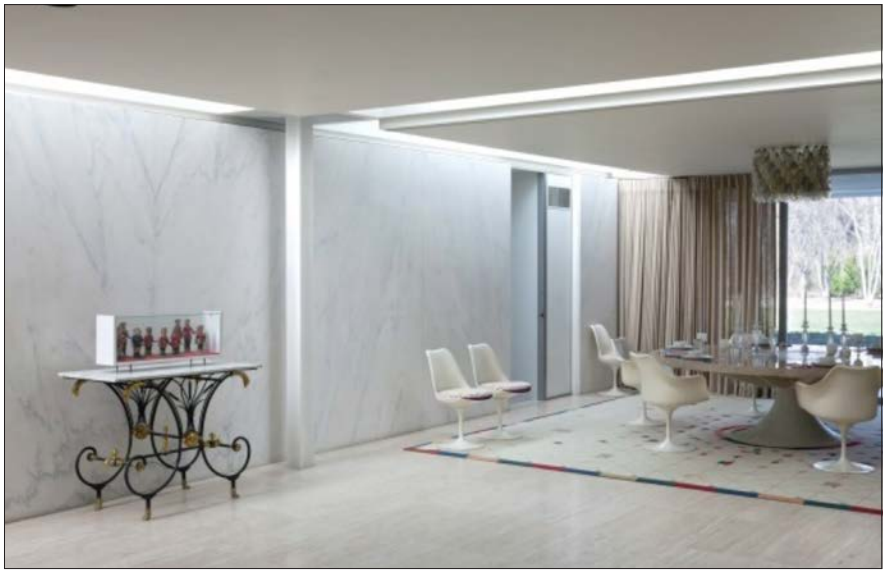


Fig. 8.5.9.2 View of the Living and Dining Rooms featuring Alexander Girard's Shadowbox with Rajput Figures. Date: 2010. Photo credit: Newfields.

8.6 CONVERSATION PIT

8.6.1 CONVERSATION PIT CUSHIONS, RUGS, AND PILLOWS (MH2010.300–.354, .546–.580)

Girard designed the Conversion Pit in two colorways—one for spring/summer and one for fall/winter. The cushion slipcovers, pillows, and rug were switched out during the seasonal transition that occurred twice annually. Girard began sourcing fabrics for the pillows in 1955, and the Newfields Archives contain textile samples that illustrate a wide variety of sources: striped and checked fabrics in red, yellow, and neutral shades for spring/summer; and a variety of ikat, brocade, embroidered, and plaid fabrics in deep red, orange, and violet shades for fall/winter.[73] The fabrics were sourced from Spain, Panama, Indonesia, Mexico, Thailand, Persia, Myanmar, India, China, and the United States, and Girard's own "Diamond" fabric from his 1954 textile line for Herman Miller was also used.[74] The original fall/winter cushion slipcovers were constructed from a red handwoven fabric designed by Jack Lenor Larsen, while the spring/summer cushions were covered in a beige silk from Scalamandre Silks, Inc.[75] Both the beige and tan diamond-patterned spring/summer rug (see Fig. 8.5.8.3) and the red fall/winter rug were woven by Treganowan.[76]

In 1973, new spring/summer pillows were made from Girard-designed *Rayamex*, *Mexicotton*, and *Mexicotton Stripe* fabrics.[77] The spring/summer rug was also replaced that year, and seasonal slipcovers for both fall/winter and spring/summer were remade with fabrics similar to the originals.[78] At some point before 1991 the foam cushions were remade.[79] The Conversation Pit was remodeled in 1994–1995, at which time cushions of different dimensions—most notably with thicker seat backs (Fig. 8.6.1.2)—were fabricated.[80] While new slipcovers in both the red and beige colorways were discussed,

Fig. 8.6.1.1 Conversation Pit with fall/winter cushions, carpet, and pillows. Date: 1958 Photo credit: © Ezra Stoller / Esto, 27T.003C

Fig. 8.6.1.3 Conversation Pit with fall/winter pillows and rug. Date: 2010. Photo credit: Newfields.

Fig. 8.6.1.2 Mock-up of new, thicker cushions in the Conversation Pit during the 1994–1995 remodel. Date: 1995. Photo credit: Miller House and Garden Collection (M003), Newfields Archives

Fig. 8.6.1.4 Conversation Pit with spring/summer pillows and rug. Date: 2016. Photo credit: Library of Congress, Prints & Photographs Division, photograph by Carol M. Highsmith, LC-DIG-highsm-41027

ultimately only the beige was made.[81] Two new pillows were also purchased.[82] While there are no records indicating replacement of the fall/winter rug, it has likely been replaced at some point since the original was made in 1955, and both rugs were altered to fit the remodeled Conversation Pit in 1995.[83] Similarly, a number of pillows are unaccounted for in the Newfields Archives records, so their date of purchase and place of origin are unknown. Newfields staff continues to rotate the pillows and rugs twice a year to coincide with the fall and spring seasons.

8.6.2 Brass Low Table, Alexander Girard, 1958 (base); 1979 (top) (MH2010.17A-B)

The base for this table was designed by Alexander Girard and was in the Millers' home by 1958. The original tabletop had been Persian with inlay (see Fig. 8.5.3.3) but it was damaged and replaced in 1979.[84] Girard initially sent XSM a Mexican marble sample for the new tabletop in 1976 but she felt it would "look dull in the winter."[85] Instead, she wrote:

> What I would really like is a brass tabletop which I feel would look well all year round and which could be used with the base I have which you designed. I have looked at brass tabletops from India at various places. I don't like any of them as well as your handsome scalloped one which you had in front of your fire in your old house. Is there a possibility that I could get one of similar design?[86]

Girard replied that their tabletop was purchased in New York some time ago and was probably Moroccan, but they could have something similar fabricated in Los Angeles.[87] The new tabletop was shipped to the Millers in June of 1979.[88]

Fig. 8.6.2.1 Alexander Girard, Brass Low Table, 1958–1977, brass, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.17A–B © Alexander Hayden Girard. Date: 2010. Photo credit: Newfields.

Fig. 8.6.2.2 Conversation Pit featuring the Brass Low Table with brass tabletop. Date: 2010. Photo credit: Newfields.

8.7 STORAGE WALL

8.7.1 “HIGHTOWN VILLAGE,” GIANCARLO “TUNSI” GIRARD, 1967 (MH2010.267)

An invoice from Alexander Girard indicates the Millers purchased this item in the summer of 1967.[89]

8.7.2 ADORATION OF THE MAGI, GIANCARLO “TUNSI” GIRARD, 1957 (MH2010.599)

Alexander Girard invoiced the Millers for this “Nativity Ceramic” by Tunsi Girard in December 1957.[90] It was displayed annually during the Christmas season as part of XSM’s holiday creche display in her home. Newfields displays XSM’s crèche collection every winter holiday season, during which time this piece replaces *Hightown Village* on the storage wall.

8.7.3 CHEST, ATTRIBUTED TO ALEXANDER GIRARD, ABOUT 1957 (MH2010.594)

This small wooden chest was probably designed by Girard, who invoiced the Millers for this item on July 27, 1957.[91] The box was sent to the Millers via Jeremy Lepard’s Sight and Sound Shop in Santa Fe, New Mexico, which Girard was known to employ for custom wood pieces and wood repair.[92] This object appears on the storage wall in photos published in *House and Garden*, February 1959 (Fig. 8.7.3.2). The squares are a variety of exotic hardwoods.

8.7.4 CROSS, ALEXANDER GIRARD, 1975 (MH2010.278)

The cross was a gift to the Millers from Girard. According to Will Miller, the date on the object (January 2, 1975) commemorates the date of a visit by Girard to the Miller family. The letters that are on the side opposite of the date are the initials of the Miller family members.

8.7.5 CLOCK, ALEXANDER GIRARD, EARLY 20TH C. (CLOCK); 1961 (CLOCK FACE) (MH2010.284)

The wooden clock case was purchased from New York art dealer George

Fig. 8.7.1.1 Giancarlo “Tunsi” Girard, Hightown Village, 1967, earthenware, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.267 © Giancarlo Girard. Date: c. 2010. Photo credit: Newfields.

Fig. 8.7.1.2 Living Room featuring Hightown Village on display in the Storage Wall. Date: After 1967. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00360

Fig. 8.7.2.1 Giancarlo "Tunsi" Girard, Adoration of the Magi, 1957, earthenware, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.599 © Giancarlo Girard. Date: c. 2010. Photo credit: Newfields.

Fig. 8.7.3.2 Storage Wall featuring the Chest, left. Date: 1958. Photo credit: © Ezra Stoller / Esto, 27T.016C

Fig. 8.7.3.1 Attributed to Alexander Girard, Chest, c. 1957, wood and brass, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.594 © Alexander Hayden Girard.Date: c. 2010.Photo credit: Newfields.

Fig. 8.7.3.3 Living Room featuring the Chest and Clock on the Storage Wall. Date: After 1967. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00361

Fig. 8.7.4.1 Alexander Girard, Cross (recto), 1975, painted wood, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.278 © Alexander Hayden Girard. Date: c. 2010. Photo credit: Newfields.

Fig. 8.7.4.2 Alexander Girard, Cross (verso), 1975, painted wood, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.278 © Alexander Hayden Girard. Date: c. 2010. Photo credit: Newfields.

Fig. 8.7.5.1 Alexander Girard, Clock, 1955–1961, metal, glass, and painted wood, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.284 © Alexander Hayden Girard. Date: 2016. Photo credit: Newfields.

Fig. 8.8.1.1 Alexander Girard, Den Rug, designed 1962, rewoven 2013, wool, Indianapolis Museum of Art at Newfields , NON_ART_318 © Alexander Hayden Girard. Date: c. 2013. Photo credit: Newfields.

M. Juergens in 1955 for the storage wall.[93] Girard designed and made and installed the clock face in 1956 and the piece can be seen in Stoller's photographs of the Storage Wall for *House and Garden* (see Fig. 8.7.3.2).[94] The face and clock mechanism were replaced by Girard in 1961 (see Fig. 8.7.3.3).[95]

8.8 DEN

8.8.1 DEN RUG, ALEXANDER GIRARD, DESIGNED 1962, REWOVEN 2013 (NON_ART_318)

Girard designed this rug for the Den in 1962. It features 89 symbols in individual lozenges (some repeated), most of which relate directly to the family and the home.[96]

In 2006, before the IMA acquired the gift of the Miller House and Garden property, a project had been initiated through Irwin Management for Edward Fields, Inc. to create replacements for the rugs in the Den, Entry and Dining Room. Irwin Management paid a 50% deposit for all three rugs to be recreated, however all the funds ended up going towards the recreation of the Den rug only. Textiles conservator Kathleen Kiefer worked with Ed Goldberg of Edward Fields, Inc. to match thread samples and images as accurately as possible for this replacement rug, which was finalized and installed in the Den in spring 2013.[97]

8.8.2 DEN DIVIDER CURTAIN, JACK LENOR LARSEN, C. 1974

The *Den Divider Curtain* created an important spatial divide between the Living Room and the Den, allowing a less formal area of the house to be concealed from view when the family was entertaining.

The original *Den Divider Curtain* was made from a red and gold striped Khari printed muslin (Fig. 8.8.2.2), imported from India.[98] It was replaced in 1963.[17] The current fabric dates from the mid-1970s and Jack Lenor Larsen identified it as one of his designs when he visited the home in 2009.[99]

8.9 MASTER BEDROOM

8.9.1 PIETRA DURA LOW TABLE, ATTRIBUTED TO RICHARD BLOW AND ALEXANDER GIRARD; 1955 (TOP); 1963 (BASE) (MH2010.49)
Girard designed all of the brass bases for the tables throughout the house. The top originally resided in the Living Room with a different table base (Fig. 8.9.1.2). While none of the Newfields Archives records attribute this table to Richard Blow, it is almost certainly his work.

8.9.2. MASTER BEDROOM CURTAINS IN "CUTOUT" PATTERN, ALEXANDER GIRARD, C. 1993, ORIGINALLY DESIGNED 1954 (MH2010.396.1)

The "Cutout" pattern was designed by Alexander Girard in 1954 as part of his debut textile line for Herman Miller Furniture Company. The Millers ordered this fabric for the Master Bedroom in 1955 and had the curtains periodically replaced several times, the last known occurrence being 1992/1993.[100]

Fig. 8.8.1.2 Den Rug. Date: After 1962. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00384

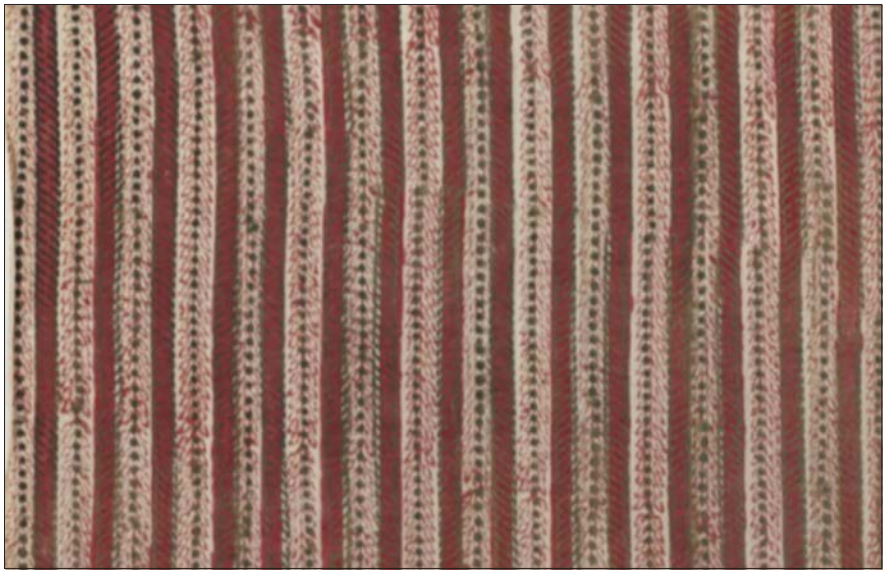


Fig. 8.8.2.2 Swatch of original Khari printed muslin fabric for Den Divider Curtain. Date: 1955/1957. Photo credit: Miller House and Garden Collection (M003), Newfields Archives

Fig. 8.8.2.1 Jack Lenor Larsen, Den Divider Curtain, c. 1974, textile, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.356 © Jack Lenor Larsen. Date: c. 2010. Photo credit: Newfields.

Fig. 8.9.1.1 Alexander Girard and Richard Blow, Pietra Dura Low Table, 1955 (top), 1963 (base) Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.49 © Alexander Hayden Girard. Date: c. 2010. Photo credit: Newfields.

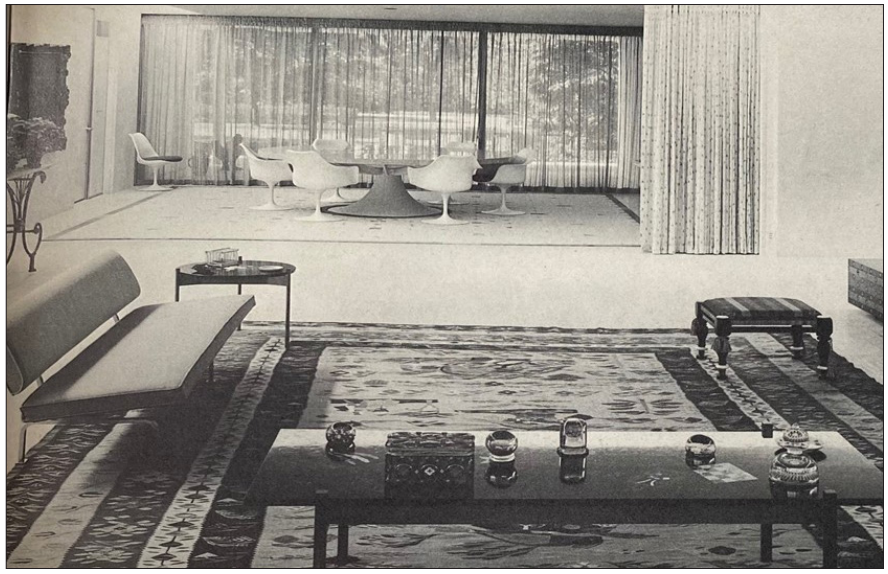


Fig. 8.9.1.2 Living Room featuring the Pietra Dura Low Table with different base. Date: 1962. Photo credit: Balthazar Korab, published in L'Oeil, October 1962

Fig. 8.9.2.1 Alexander Girard, Master Bedroom Curtains in "Cutout" Pattern, designed 1954, replaced c. 1993, textile, Indianapolis Museum of Art at Newfields, MH2010.396.1 © Alexander Hayden Girard. Date: c. 2010. Photo credit: Newfields.

Fig. 8.9.1.3 Master Bedroom featuring the Pietra Dura Low Table. Date: After 1963 Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00385

Fig. 8.9.2.2 Master Bedroom featuring Master Bedroom Curtains in "Cutout" Pattern. Date: 1958. Photo credit: © Ezra Stoller / Esto, 27T.021

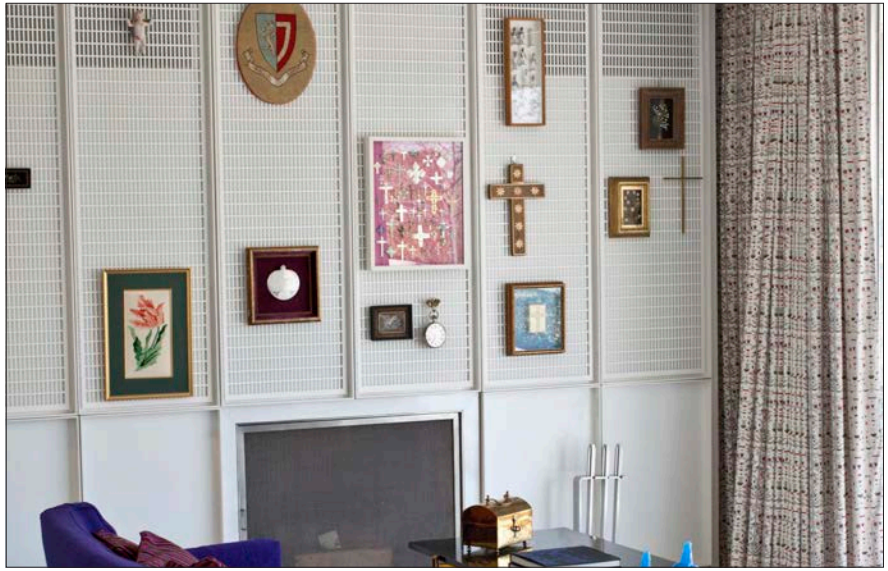


Fig. 8.9.2.3 Master Bedroom featuring Master Bedroom Curtains in "Cutout" Pattern. Date: 2010. Photo credit: Newfields.

Fig. 8.10.1.1 Alexander Girard, Kitchen Rug, designed 1964, replaced 1992, wool, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.403 © Alexander Hayden Girard. Date: c. 2008. Photo credit: Newfields.

8.10 KITCHEN AND LAUNDRY

8.10.1 KITCHEN RUG, ALEXANDER GIRARD; DESIGNED 1964; PRODUCED 1992
(MH2010.403)

The original rug was designed in 1964, and the present one dates from 1992. The original 1964 rug was 113 inches wide x 124 inches long.[101] In 1973, Girard designed a new rug which was rejected by XSM.[102] When new cabinets were added to the west wall of the kitchen in 1974, it was determined that a new rug would need to be woven.[103] In October of 1974, XSM wrote to Girard:

> In regard to the kitchen rug, I am afraid I really like the old pattern better than your new design. Can you find the design for the old one? As soon as the new cabinets come and are installed I want to look at the space anew in order to determine what rug size I really want; then we can proceed with the rug and new curtains of the same colors that are in the old rug and the runners. I love this color scheme in there and I am reluctant to introduce any new colors such as those in your new design into the kitchen. I would like to keep it in the blue, light gray, charcoal gray and olive green.[104]

The old rug was sent to Girard for reference as he had not saved the templates for it.[105] New rugs were woven by Treganowan in 1975 and again in 1992.[106]

8.10.2 KITCHEN CURTAINS IN "EDEN" PATTERN, ALEXANDER GIRARD, ORIGINALLY DESIGNED 1966
(MH2010.402.1A-B)

The Kitchen curtains in Ezra Stoller's 1958 photographs of the home are an orange and white striped pattern, likely a Georg Jensen linen fabric.[107] A 1969 invoice for 36.75 yards of "Eden" fabric indicates this was probably the first year the Millers installed this textile in the Kitchen.[108] In correspondence between Girard and Owen Hungerford dated December 6, 1974, Girard discussed that the current Kitchen drapes were in the "Eden" pattern, but the fabric had been discontinued and XSM would need to select a different pattern to replace her existing curtains.[109] The last date of replacement for the curtains noted in the archive is 1987, although the pattern is not specified.[110]

Fig. 8.10.1.2 Kitchen featuring the Kitchen Rug. Date: Between 1969 and 1974[27]. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00386

Fig. 8.10.1.3 Kitchen featuring the Kitchen Rug. Date: c. 2008. Photo credit: Newfields.

Fig. 8.10.2.1 Alexander Girard, Kitchen Curtains in "Eden" Pattern, designed 1966, textile, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.402.1A-B © Alexander Hayden Girard. Date: c. 2008 Photo credit: Newfields.

Fig. 8.10.2.2 Kitchen featuring the original curtains. Date: 1958. Photo credit: © Ezra Stoller / Esto, 27T.023C

Fig. 8.10.2.3 Kitchen featuring Kitchen Curtains in "Eden" Pattern. Date: Between 1969 and 1974. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00386

Fig. 8.10.3.1 Giancarlo "Tunsi" Girard, Acrobatic Figures, 1969, wood and paint, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.61 © Giancarlo Girard. Date: c. 2010. Photo credit: Newfields.

8.10.3 "ACROBATIC FIGURES," GIANCARLO "TUNSI" GIRARD, 1969 (MH2010.61)

This piece was purchased from Alexander Girard on March 31, 1971. A memo from Owen Hungerford to JIM and XSM dated September 8, 1977 indicated the artwork was repainted by H. Hatter and S. Embry.[111] The object was cracked and damaged from humidity and was transferred to the IMA conservation department for treatment in 2015. The painting was conserved in 2021 and reinstalled in a microclimate Plexiglas case in 2022.

8.11 CHILDREN'S PLAYROOM AND BEDROOMS

8.11.1 PLAYROOM RUG, ALEXANDER GIRARD, DESIGNED 1955, RE-WOVEN 1992 (MH2010.370)

Girard designed the original Children's Playroom Rug in 1955 and described it as a "special Girard design" that was "Haitian, hand-tufted."[112] *House and Garden* noted, "The carpet designed by Alexander Girard from every color in the sample book is especially practical because individual squares can be easily replaced when worn."[113] When the Playroom was converted into XSM's office in 1972, Girard designed a new rug and hallway runners by gluing color sample tiles directly to a floor layout for the room (Fig. 8.11.1.1).[114] A new cut and loop pile rug based on Girard's 1972 design was woven by Ernest Treganowan, Inc. in 1992, and the hallway runners were no longer used.[115]

8.11.2 "TOWN STREET SCENE," GIANCARLO "TUNSI" GIRARD, 1972 (MH2010.122)

The Millers visited Tunsi Girard in Florence probably in early 1972 and ordered this painted ceramic wall panel and several other ceramic objects.[116] Although they had a few other artworks by Tunsi Girard, they had acquired those works through Alexander Girard. It is unclear where this artwork originally hung in the house, but it is now located in the Children's Playroom.

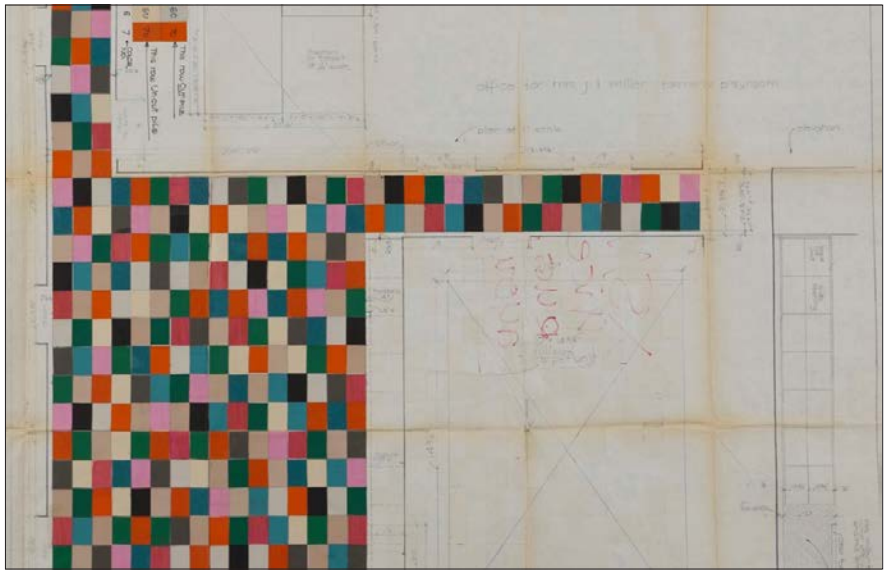


Fig. 8.11.1.1 Colored design for Xenia S. Miller Office Rug by Alexander Girard (annotated). Date: 1972. Photo credit: Miller House and Garden Collection (M003), Newfields Archives

Fig. 8.11.2.1 Giancarlo "Tunsi" Girard, Town Street Scene, 1972, earthenware and wood, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.122 © Giancarlo Girard. Date: c. 2010. Photo credit: Newfields.

Fig. 8.11.1.2 Children's Playroom Rug. Date: c. 1970s. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00382

Fig. 8.11.3.1 Alexander Girard, Children's Playroom Curtains in "Multiform" Pattern, designed 1954, textile, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.375.1 © Alexander Hayden Girard. Date: 2010. Photo credit: Newfields.

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Fig. 8.11.3.2 Herman Miller "Multiform" (#648) by Alexander Girard, sample (Item No. 61) for Playroom curtains. Date: 1955/1957. Photo credit: Miller House and Garden Collection (M003), Newfields Archives

Fig. 8.11.3.4 Children's Playroom featuring Curtains in "Multiform" Pattern. Date: 2010. Photo credit: Newfields.

Fig. 8.11.3.3 Children's Playroom featuring Curtains in "Multiform" Pattern. Date: c. 1970s. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00382

Fig. 8.11.4.1 Alexander Girard, Margaret's Bedroom Curtains in Orange "Quatrefoil" Pattern, designed 1954, silk, Indianapolis Museum of Art at Newfields, MH2010.377.1 © Alexander Hayden Girard. Date: 2010. Photo credit: Newfields.

the Children's Playroom.

8.11.3 CHILDREN'S PLAYROOM CURTAIN IN "MULTIFORM" PATTERN, ALEXANDER GIRARD, DESIGNED 1954 (MH2010.375.1)

The "Multiform" pattern was designed by Alexander Girard in 1954 as part of his debut textile line for Herman Miller Furniture Company.[117] The curtains were most recently replaced in 1972/1973.[118]

8.11.4 MARGARET'S BEDROOM CURTAINS IN "QUATREFOIL" PATTERN, ALEXANDER GIRARD, DESIGNED 1954 (MH2010.377.1)

All of the children's bedrooms featured curtains in the "Quatrefoil" pattern, designed in 1954 by Alexander Girard for his debut textile line for Herman Miller Furniture Company.[119] The boys' shared bedroom was east of the Playroom, and its original "Quatrefoil" curtains in ecru linen were eventually replaced with plain beige curtains, possibly in 1984.[120] The girls' bedrooms flank the west side of the Playroom and were designed with their own distinct color schemes, which were ultimately altered when they were remodeled in 1972/1973.[121] Margaret's bedroom was the southernmost of the girl's bedrooms and originally had green "Quatrefoil" curtains (Fig. 8.11.4.2) with a bright green rug.[122] An orange rug was selected for the remodel, with "Quatrefoil" curtains in an orange colorway to match.[123]

8.11.5 ELIZABETH'S BEDROOM CURTAINS IN "QUATREFOIL" PATTERN, ALEXANDER GIRARD, DESIGNED 1954 (MH2010.378.1)

Elizabeth's bedroom was the middle girl's bedroom and originally had multicolor "Quatrefoil" curtains[124] (Fig. 8.11.5.3) with a turquoise rug.[125] A blue rug was selected for the remodel, with "Quatrefoil" curtains in a blue colorway to match.[126]

8.11.6 CATHERINE'S BEDROOM CURTAINS IN "QUATREFOIL" PATTERN, ALEXANDER GIRARD, DESIGNED 1954 (MH2010.382.1)

Catherine's bedroom was the northernmost of the girl's bedrooms and originally had "Quatrefoil" curtains in an orange colorway (Fig. 8.11.6.3) with a rose pink rug.[128] A green rug was selected for the remodel, with "Quatrefoil"

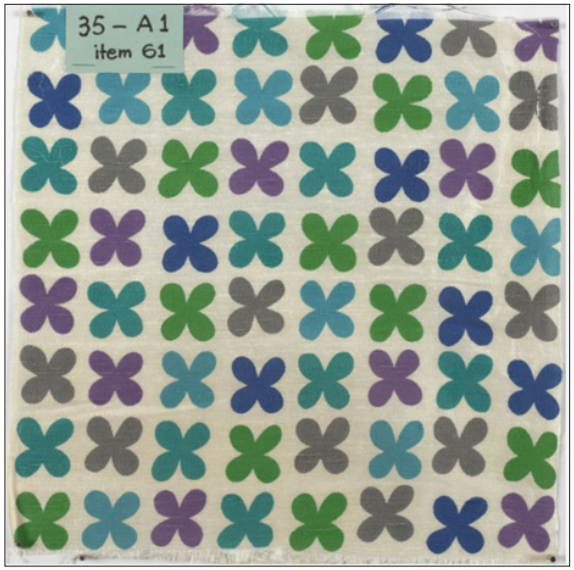

Fig. 8.11.4.2 Herman Miller "Quatrefoil" (#628) by Alexander Girard, sample (Item No. 61) for Girl's Bedroom #3 curtains. Date: 1955/1957. Photo credit: MHG_IVe_B093_F083_005-006, Miller House and Garden Collection (M003), Newfields Archives

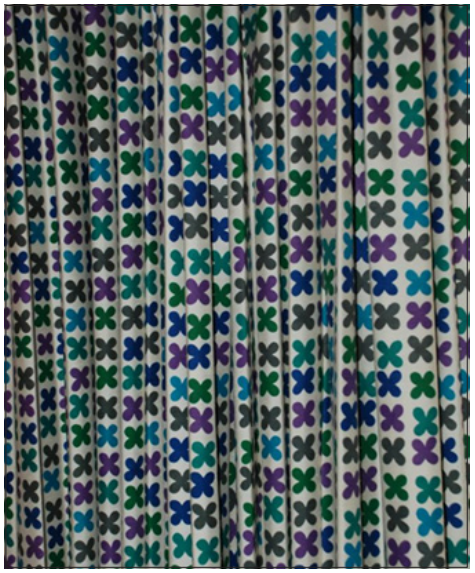

Fig. 8.11.5.1 Alexander Girard, Elizabeth's Bedroom Curtains in Blue "Quatrefoil" Pattern, designed 1954, silk, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.378.1 © Alexander Hayden Girard. Date: 2010. Photo credit: Newfields.

Fig. 8.11.5.2 Elizabeth's Bedroom featuring Curtains in Blue "Quatrefoil" Pattern. Date: 2010. Photo credit: Newfields.

Fig. 8.11.6.1 Alexander Girard, Catherine's Bedroom Curtains in Green "Quatrefoil" Pattern, designed 1954, silk, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.382.1 © Alexander Hayden Girard. Date: 2010. Photo credit: Newfields.

Fig. 8.11.5.3 Herman Miller "Quatrefoil" (#627) by Alexander Girard, sample (Item No. 61) for Girl's Bedroom #2 curtains. Date: 1955/1957. Photo credit: MHG_IVe_B091_f051_002, Miller House and Garden Collection (M003), Newfields Archives

Fig. 8.11.6.2 Catherine's Bedroom featuring Curtains in Green "Quatrefoil" Pattern. Date: 2010. Photo credit: Newfields.

Fig. 8.11.6.3 Herman Miller "Quatrefoil" (#629) by Alexander Girard, sample (Item No. 61) for Girl's Bedroom #1 curtains. Date: 1955/1957. Photo credit: MHG_IVe_B091_f051_001, Miller House and Garden Collection (M003), Newfields Archives

Fig. 8.12.1.1 Alexander Girard, North Pool Gate, 1963, metal, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.40 © Alexander Hayden Girard. Date: c. 2010. Photo credit: Newfields.

curtains in a green colorway to match.[129]

8.12 GARDEN

8.12.1 POOL GATES, ALEXANDER GIRARD, 1963 (MH2010.440; MHG2010.441)

The iron *Pool Gates* were designed by Girard and installed in 1963 at the north and west entries to the Swimming Pool area. They are similar to those at Girard's house in Santa Fe. The West Pool Gate is missing a bell.

8.13 STORAGE

8.13.1 CENTERPIECE WITH INDIAN FIGURES, ALEXANDER GIRARD, C. 1957 (TR10962/1396A-C)

This elaborate centerpiece features Indian carved and painted wooden angels playing musical instruments. Girard owned similar figures in his personal collection which are now on display at the Museum of International Folk Art (MOIFA) in Santa Fe. This *Centerpiece* can be seen in Stoller's 1958 photographs of the home (Fig. 8.13.1.1).

8.13.2 CENTERPIECE, ALEXANDER GIRARD, 1961 (TR10962/1481A-III)[130]

This elaborate centerpiece of arches, flags, mirrors, balustrades, flowers, and urns was designed by Girard for the Millers and was used for holiday meals. It is an excellent example of Girard's theatricality and is evocative of the many "sets" he would design in the early 1980s for his folk art collection at MOIFA.

8.13.3 HAND AND FLOWER ON POST, ALEXANDER GIRARD, C. 1968 (MH2010.475A-B)[131]

This sculpture presages Girard's 1971 *Hand and Dove* Environmental Enrichment panel for Herman Miller. It is currently damaged and being stored in the Newfields Conservation department.

Fig. 8.12.1.2 Alexander Girard, West Pool Gate, 1963, metal, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.41 © Alexander Hayden Girard. Date: c. 2010. Photo credit: Newfields.

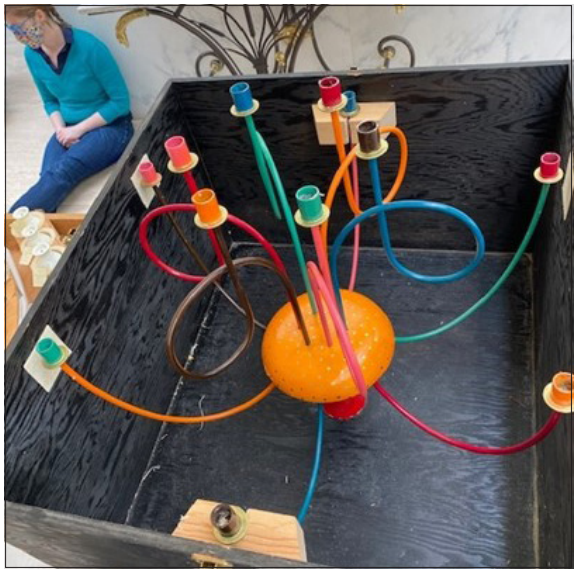

Fig. 8.13.1.2 Alexander Girard, Centerpiece with Indian Figures (central candelabrum), c. 1957, wood and metal, dimensions variable, Indianapolis Museum of Art at Newfields, TR10962/1396A-C © Alexander Hayden Girard. Date: 2022 Photo credit: Newfields.

Fig. 8.13.1.1 Alexander Girard, Centerpiece with Indian Figures. Date: 1958. Photo credit: © Ezra Stoller / Esto, 27T.008C

Fig. 8.13.1.3 Alexander Girard, Centerpiece with Indian Figures (one of three base segments and Indian figures), c. 1957, wood and metal, Gift of Margaret, Catherine, Elizabeth, and Will Miller, TR10962/1396A-C © Alexander Hayden Girard. Date: 2022. Photo credit: Newfields.

Fig. 8.13.1.4 Alexander Girard, Centerpiece with Indian Figures (two of three base segments), c. 1957, wood and metal, Gift of Margaret, Catherine, Elizabeth, and Will Miller, TR10962/1396A-C © Alexander Hayden Girard.Date: 2022. Photo credit: Newfields.

Fig. 8.13.2.2 Miller family members including JIM, Will, and Hugh, at the Dining Room Table with the Girard Centerpiece. Date: c. 1970. Photo credit: PAC 36, Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

Fig. 8.13.2.1 XSM, Will Miller, and his wife Lynn Maguire at the Dining Room Table with the Girard Centerpiece. Date: 1984. Photo credit: Irwin-Sweeney-Miller Family Collection, Indiana Historical Society

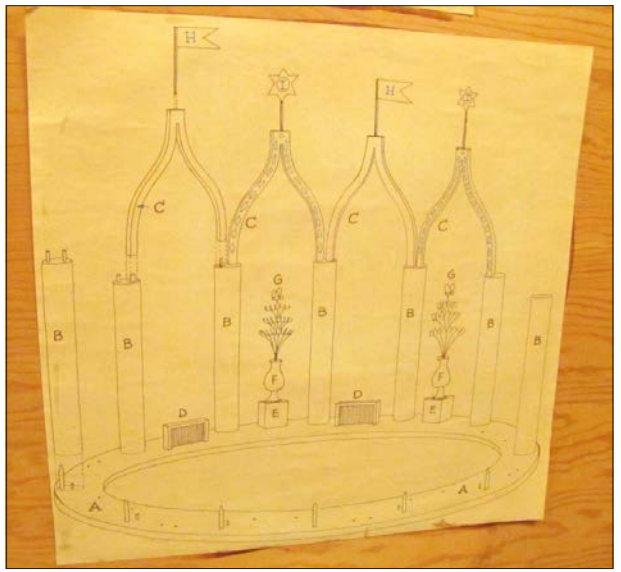

Fig. 8.13.2.3 Alexander Girard, Centerpiece (assembly instructions), 1961, wood, metal and glass,Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, TR10962/1481A-III © Alexander Hayden Girard. Date: 2022 Photo credit: Newfields.

Fig. 8.13.2.4 Alexander Girard, Centerpiece (base, arches, urns, and boxes with seashell detail), 1961, wood, metal and glass, Gift of Margaret, Catherine, Elizabeth, and Will Miller, TR10962/1481A-III © Alexander Hayden Girard. Date: 2022 Photo credit: Newfields.

Fig. 8.13.2.5 Alexander Girard, Centerpiece (floral elements), 1961, wood, metal and glass, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, TR10962/1481A-III © Alexander Hayden Girard. Date: 2022. Photo credit: Newfields.

Fig. 8.13.2.6 Alexander Girard, Centerpiece (flags, mirrors, and balustrades), 1961, wood, metal and glass, Gift of Margaret, Catherine, Elizabeth, and Will Miller, TR10962/1481A-III © Alexander Hayden Girard. Date: 2022.Photo credit: Newfields.

Fig. 8.13.3.1 Alexander Girard, Hand and Flower on Post, c. 1968, hardstones, brass, metal, ivory, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, MH2010.17A–B © Alexander Hayden Girard. Date: c. 2010 Photo credit: Newfields.

Fig. 8.13.3.2 View of Conversation Pit featuring Hand and Flower on Post, upper left Date: After 1979. Photo credit: Library of Congress, Prints & Photographs Division, Balthazar Korab Collection, LC-DIG-krb-00354

Fig. 8.13.4.2 Ceramic Tabletop shown at what is likely the Herman Miller Showroom launch for the Girard Group exhibition. Date: c. 1967. Photo credit: Herman Miller Archives

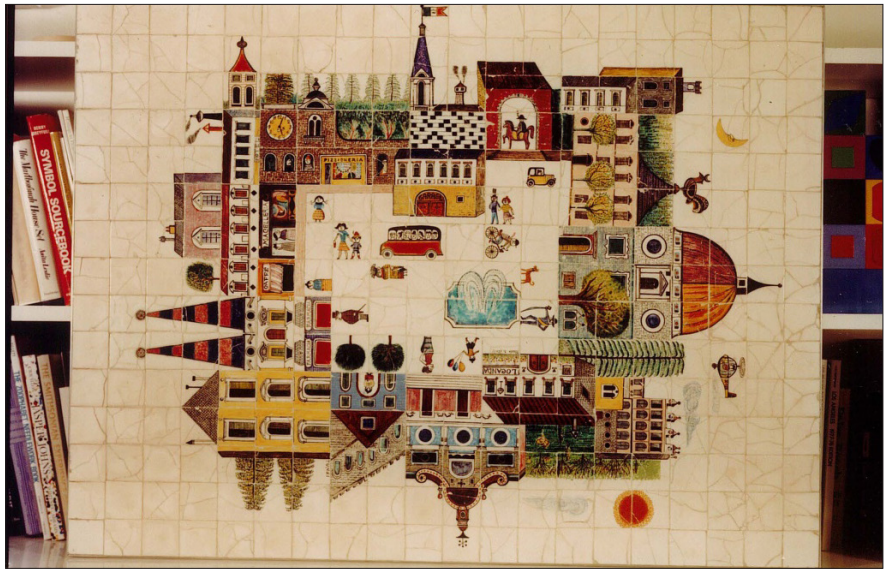

Fig. 8.13.4.1 Giancarlo "Tunsi" Girardand Alexander Girard, Ceramic Tabletop, 1967–1968, earthenware and metal,Gift of Margaret, Catherine, Elizabeth, and Will Miller, TR10962/1688A-B © Giancarlo Girard © Alexander Girard. Date: unknown Photo credit: Newfields.

Fig. 8.13.5.1 Giancarlo "Tunsi" Girard, Italian Village (Citta di Casteltauro) Outdoor Sculpture, 1973, earthenware, wood, and paint, Indianapolis Museum of Art at Newfields, Gift of Margaret, Catherine, Elizabeth, and Will Miller, TR10962/1269A-PPP © Giancarlo Girard. Date: Unknown. Photo credit: Newfields.

8.13.4 CERAMIC TABLE AND BASE, GIANCARLO "TUNSI" GIRARD AND ALEXANDER GIRARD, C. 1967–1968
(TR10962/1688A-B)[130]

This ceramic tabletop was designed by Tunsi Girard in 1967 and was likely displayed at the Herman Miller Showroom in New York City for the launch of the Girard Group furniture line that year (Fig. 8.13.4.2). The Millers ordered the tabletop and a custom base in 1968.[131] It is unknown where it was placed in the House; it may have been used outside. The ceramic tiles on the tabletop are heavily cracked and in need of conservation.

8.13.5 ITALIAN VILLAGE (CITTA DI CASTELTAURO) OUTDOOR SCULPTURE, GIANCARLO "TUNSI" GIRARD, 1973
(TR10962/1269A-PPP)

In early 1972, JIM and XSM visited Tunsi Girard in Florence and ordered several ceramic artworks, including the *Italian Village*. Tunsi informed them that the piece would take at least three months to complete due to its complexity.[132] Ultimately the project took him nearly a year, and the town in its many separate parts were sent to the Millers in March of 1973.[133] Tunsi sent the numerous small human figures that populated the town separately in September 1974.[134]

In addition to the artwork itself, he enclosed elaborately illustrated instructions on how to assemble and display the artwork. The "buildings" on the lowest level double as planters, and the ceramic figures can be placed throughout the artwork.

The Millers assembled the artwork on their patio during the warmer seasons. In 1975, XSM wrote to Tunsi Girard, informing him about how much the family was enjoying their "Italian Hill Town" and noting that it was loaned to the Indianapolis Museum of Art over the summer, where it was popular with children. She indicated that the bride and groom were missing upon its return to the family, and requested a new pair.[135] For the following thirteen years—until 1988—the Millers lent the Italian Village to the Indianapolis Museum of Art every winter for display in their "Italian Pavilion," likely referring to the Clowes Pavilion.[136] XSM again noted that several of the "little people" had disappeared, and asked Tunsi Girard to send replacement figures.[137] The piece is currently in storage and in need of extensive cleaning before it can be displayed.

8.14 ENDNOTES

[1] Nancy Kriplen, *J. Irwin Miller: The Shaping of an American Town* (Bloomington, IN: Indiana University Press, 2019), 76.
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[3] Saarinen, speech given at Schöner Wohnen Congress, 11-12.
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[5] JIM, quoted in JIM and XSM, interview by Webb, June 13, 2000.
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[31] Xenia Miller to William Chambers, note, July 1973, MHG Ib B005 f043 052, Newfields Archives.
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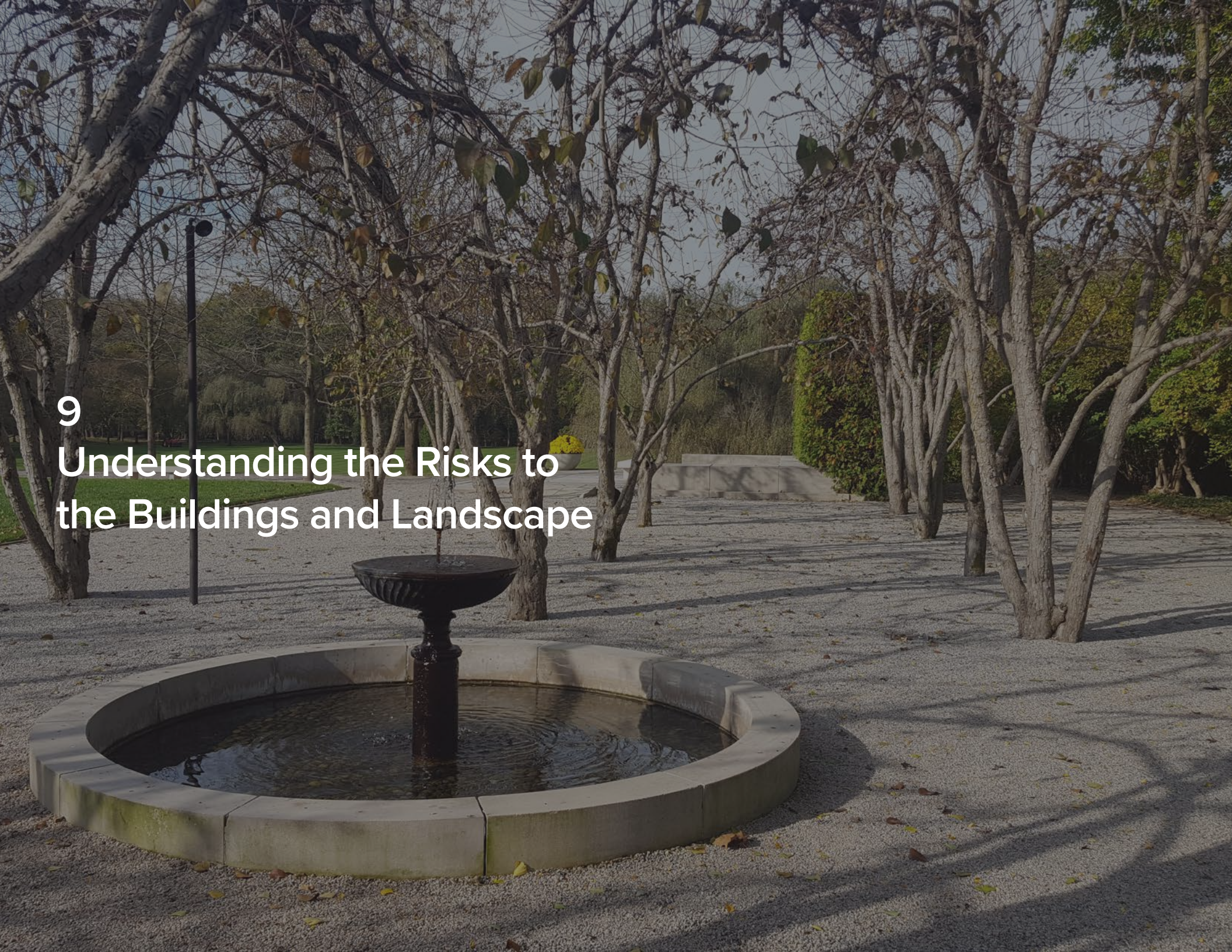

9
Understanding the Risks to the Buildings and Landscape

9 UNDERSTANDING THE RISKS TO THE BUILDINGS AND LANDSCAPE

9.1 METHODOLOGY AND INTRODUCTION

This chapter of the Conservation Management Plan (CMP) addresses issues related to the context of the Miller House and Garden (MH&G) and the potential external and internal risks to the building, its contents and the landscape. The following topics are addressed:

9.1 Methodology
9.2 Situation
9.3 Climate, Climate Change and Storms
9.4 Site Soils, Groundwater and Seismicity
9.5 Flooding and the Flatrock River
9.6 Roof Drainage Risks
9.7 Fire Risks
9.8 Mechanical, Plumbing, and Electrical Building Systems Risks
9.9 Pest Risks
9.10 Use and Visitation Risks
9.11 Site Management Risks

This section is based on observation of the buildings, site, and environs of MH&G during site visit of February 12, 2019, and subsequent site visits and remote observations on June 1-4, 2021. This section has also been informed by the publications and reports cited in the endnotes.

An analysis to determine the relative risk level or frequency for each topic is beyond the scope of this CMP. Therefore, the topics are not necessarily presented in the order of risk.

9.2 SITUATION

The MH&G is located in Columbus, Bartholomew County, Indiana (39.22745N, 85.924046W), approximately 50 miles south-southeast of Newfields in Indianapolis and 72 miles north of Louisville, Kentucky.

The City of Columbus has an estimated population of 50,474 residents and a land area of about 24.81 square miles with the downtown commercial district in the southwest corner of the municipal limits.[1] The Flatrock River flows north to south along the eastern edge of the developed portion of the city and is joined by the Driftwood River just west of the downtown area. The two rivers form the East Fork of the White River, a tributary of the Mississippi.

The MH&G is located on the west side of Washington Street, a north-south arterial street originating downtown. The House and Garden overlook a broad meadow, part of the floodplain of the east bank of the Flatrock River. The east third of the site, roughly 450 feet by 450 feet is generally level at elevation 633 feet (1955 C&GS Datum) with ±1-foot variation in finish grade. The center portion of the site, roughly 450 feet by 450 feet is generally level at elevation 620 feet with ±1-foot variation in finish grade. The transition from the east to center portions of the site takes place in a 100-foot-wide slope west of the house. The western portion of the site, a roughly 250-foot by 450-foot wooded area along the Flatrock River is lower than the central portion, but elevation data are not available.[2]

There are two points of vehicular access to the upper portion of the site. The 20-foot-wide paved main driveway enters the site from the south property line at the terminus of Highland Drive and ends at a paved parking area east of the Carport and main entrance to the House. The 18-foot-wide Service Drive enters the north end of the property from Washington Street and ends at a paved service court east of the entrance to the Kitchen. The parking area and the service area abut and are separated by a set of obscure glass fence panels. Both driveways have metal gates at the property line. A small building containing an office and restroom, originally a greenhouse, is located along the south side of the Service Drive.

The site is within the area covered by the 2013 *Columbus, Indiana: Flood Risk Management Plan*, updated in 2020, administered by the Columbus Indiana-Bartholomew County Planning Department.[3] The *Plan* does not specifically identify any cultural, architectural or heritage sites, including the Miller House and Garden.[4]

The MH&G is addressed in Newfields' *Emergency Response Plan* which is discussed in Section 10.6 of this CMP.

9.3 CLIMATE, CLIMATE CHANGE, AND STORMS

Climate

Historic climate data can indicate the typical thermal and moisture loads on a building due to sunlight, air temperature, atmospheric moisture, precipitation, and wind.

Table 9.1 characterizes the exterior climate of the MH&Gbased on data for the Indianapolis International Airport from the National Climatic Data Center (NCDC) (1973-1996 data set) and from Chapter 14: "Climatic Design Information" of the 2017 *ASHRAE Handbook—Fundamentals* (1990-2014 data set).[5]

Table 9.1 Climate Data Source Location[6]

Monitoring Station	WMO*	Latitude	Longitude	Elevation	Distance	Direction from site
Indianapolis Intl	724380	39.725	– 86.282	791 feet	50 miles	NNW

**WMO refers to World Meteorological Organization station number*

Key points of the Indianapolis International Airport data can be summarized as follows:

- Summer median extreme high temperature: 94F (dry bulb), 114 grains water/lb. dry air[7]
- Summer 1.0% occurrence, high temperature: 89F (dry bulb), 111 grains water/lb. dry air
- Winter median extreme low temperature: -8F (dry bulb), 3 grains water/lb. dry air
- Winter 99.0% occurrence, low temperature: 3F (dry bulb), 5 grains water/lb. dry air
- Summer median extreme high humidity ratio: 86F (dry bulb), 151 grains water/lb. dry air
- Summer 1.0% occurrence, high humidity ratio: 82F (dry bulb), 131 grains water/lb. dry air
- Mean daily dry bulb temperature range: 13.3F (December) to 19.4F (June)
- Mean monthly precipitation:
  - ≥4.0 and <4.5 inches: May, July
  - ≥3.5 and <4.0 inches: March, April, June, August
  - ≥3.0 and <3.5 inches: November, December
  - ≥2.5 and <3.0 inches: February, September, October
  - ≥2.0 and <2.5 inches: January

  The highest monthly precipitation of 11.10 inches occurred in July.
- Average monthly wind speed:
  - ≥11.0 and <12.0 miles per hour: January, March, April
  - ≥10.0 and <11.0 miles per hour: February, November, December
  - ≥9.0 and <10.0 miles per hour: May, October
  - ≥8.0 and <9.0 miles per hour: June
  - ≥7.0 and <8.0 miles per hour: July, August, September

The exterior climate is classified as International Climate Zone 4A, Mixed-Humid. Seasonally, the climate may be characterized as having warm-humid summers with episodes of high dew point temperature combined with high dry bulb temperature and cold winters with periods of low relative humidity.

Heating loads dominate from October through April, and cooling loads dominate from May through September. The annual heating load is 5,249 heating degree days (HDDs at 65F base) compared to an annual cooling load of 1,106 cooling degree days (CDDs at 65F base).

With respect to heating loads (68F, 30% RH) and cooling loads (75F, 60% RH) for make-up air and air infiltration, the sensible heating loads are more than six times greater than sensible cooling loads, and the dehumidification or latent cooling loads are 1.13 times greater than the sensible cooling loads.

Solar radiation plays a critical role in thermal stress and deterioration of building materials, as well as drying and moisture transport in soils and in porous building materials. Interior finishes and collections are damaged by visible light and ultraviolet radiation. The mean daily solar

radiation received by a building depends on the orientation of the surface, the time of year and shading from adjacent landscape and buildings.

Table 9.2 provides the National Climatic Data Center data for the average daily solar radiation received by horizontal and vertical surfaces by month:

Table 9.2 Average Incident Clear Day Global Solar Radiation on Horizontal and Unshaded Vertical Surfaces (BTU/Foot²/Day)[8]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Horiz.	900	1250	1730	2200	2510	2620	2540	2260	1850	1350	950	790
South	1890	1940	1790	1410	1080	930	980	1240	1600	1830	1830	1800
East	680	880	1130	1330	1420	1460	1430	1330	1160	910	690	610
West	680	880	1130	1330	1420	1460	1430	1330	1160	910	690	610
North	190	250	330	430	580	680	630	480	360	270	200	170

Climate Change

The ASHRAE and NCDC data do not address projected changes in climate. *The Fourth National Climate Assessment* addresses climate change impacts in the Midwest region of the United States, which includes Indiana.[9] A more detailed description of climate change impacts on the state can be found in the National Oceanic and Atmospheric Administration's (NOAA) *State Summary for Indiana* and in Purdue University's *Indiana's Past & Future Climate: A Report from the Indiana Climate Change Impacts Assessment*.[10] It is prudent to consider the following future climatic conditions identified in Purdue University's report when addressing risks at the MH&G:

- Temperatures are projected to rise about 5°F to 6°F by mid-century, with significantly more warming by century's end.

  Why it matters: A rising average temperature increases the chance of extreme heat and reduces the chance of extreme cold, and it also changes the timing and length of the frost-free season when plants grow. These shifts will impact air quality, extend the growing season and the allergy season, and create more favorable conditions for some pests and invasive species.

- The number of extremely hot days will rise significantly in all areas of the state. In the past, southern Indiana averaged about seven of these days per year, but by mid-century this region is projected to experience 38 to 51 extremely hot days per year.

  Why it matters: Extreme heat raises the likelihood of heat-related illnesses, such as heat exhaustion and heat stroke, which can lead to increased hospitalizations and medical costs. Children and the elderly are especially vulnerable. Extreme heat also reduces crop yields, counteracting the benefits of a longer growing season.

- Extreme cold events are declining.

  Why it matters: Cold temperatures control populations of disease-carrying insects such as mosquitoes and ticks, as well as forest pests. Warmer winters would allow some of these species to remain active for longer periods or to expand their ranges into Indiana.

- Average annual precipitation has increased 5.6 inches since 1895, and more rain is falling in heavy downpours. Winters and springs are likely to be much wetter (rain) by mid-century, while expected changes in summer and fall precipitation are less certain.

  Why it matters: Increased precipitation, especially in the form of heavy rain events, will increase flooding risks and pollute water as combined sewer systems overflow and fertilizers run off of farm fields. Warmer summers with the same or less rain would increase stress on agricultural crops and drinking water supplies.

- The frost-free season has lengthened by nine days per year statewide since 1895. This trend is projected to continue and intensify. By mid-century, central Indiana's frost-free season is projected to increase by 3.5 to 4.5 weeks compared to the past.

  Why it matters: Longer growing seasons can increase the productivity of food crops and forests, and could expand crop-production opportunities in northern latitudes or the possibility of double-cropping further south. But they also increase growth of

less desirable plants like ragweed and create favorable conditions for some invasive species.[11]

Wind

NOAA's National Centers for Environmental Information reports the following wind-related events for Bartholomew County, Indiana:

Table 9.3 Wind Events for Bartholomew County, Indiana[12]

Event Type	Date Range	Incidents	Severity
High wind	January 1996 to April 2016	13	56 to 73 miles per hour (49 to 63 knots)
Tornado	April 1997 to November 2005	18	F1 to F4
Thunderstorm with high wind	April 1957 to June 2019	161	47 to 81 miles per hour (41 to 70 knots)

The *ASCE 7 Hazards Report* for the MH&G, published by the American Society of Civil Engineers, (Appendix H) provides the following design wind loads for the Miller House as a Class II Risk:

- Wind Speed: 106 miles per hour (mph);
- 10-year Mean Recurrence Interval (MRI) 74 mph;
- 25-year MRI 81 mph;
- 50-year MRI 85 mph; and
- 100-year MRI 93 mph.[13]

Wind speed is a critical design factor in roofing systems, skylights, cantilevered overhangs and wall panels. Wind loads may be positive (pressure) or negative (suction). For example, a roof membrane may normally experience gravity force (its weight) but under strong wind conditions it may experience uplift forces because of negative pressure.

Hail

NOAA's National Centers for Environmental Data reports the following hail events for Bartholomew County, Indiana:

Table 9.4 Hail Events for Bartholomew County, Indiana[14]

Event Type	Date Range	Incidents	Severity
Hail	March 1963 to July 2018	59	0.75 to 1.75 inches diameter

Hail can damage exposed roofing membranes and skylights, as well as outdoor sculpture and vegetation.

Ice

The *ASCE 7 Hazards Report* for the MH&G, published by the American Society of Civil Engineers, (Appendix H) provides the following design ice loads for the House as a Class II risk building:

- Ice Thickness: 1.50 inches
- Concurrent Temperature: 5F
- Gust Speed: 40 mph 15

Civil Engineers, (Appendix H) provides the following design ice loads for the House as a Class II risk building:

The ice thickness value is for equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds. Exposed overhead cables and unheated structural frames and elements are subject to icing, as well as trees.

Lightning

In 2019, Vaisala's National Lightning Detection Network reported an average annual cloud-to-ground lightning strike frequency of 11.3 lightning flashes per square mile in Indiana and 10.36 to 12.95 lightning flashes per square mile in Bartholomew County.[16] This is relatively high frequency and the elevation of the MH&G relative to the open meadow may increase the potential frequency of lightning strikes above the local average. Lighting can strike not only buildings, but also nearby trees, underground power cables and conduits, and outdoor electric generators.

The simplified lightning risk calculator in *NFPA 780 (2020): Standard for the Installation of Lightning Protection Systems*, published by the

National Fire Protection Association, takes into account several factors including: lightning flash density; building size, height, and configuration; materials of the building structure and cladding; occupancy; and value of contents.[17] For the MH&G, the *NFPA 780* simplified risk calculator indicates that a lightning protection system is needed.

Risks Associated with Climate, Climate Change, and Storms

The available historical data and climate change projections for Bartholomew County, Indiana indicate the following risks to the MH&G and collections:

- High relative humidity on summer, low relative humidity in winter;
- Seasonally concentrated rain events; and
- Strong solar radiation.

The potential future impacts of climate change on the MH&G include:

- Increased demands on overall energy infrastructure, especially electric utilities, and possible interruptions if capacity is not increased; and
- Increased loads on storm-water management systems, including roofs, if the intensity of rain events increases.

A severe wind event can present the following risks of damage to the MH&G:

- Uplift forces acting on roofing membranes;
- Uplift forces acting on skylight covers and skylight glazing;
- High wind loads on sliding doors and window glazing;
- Projectile damage to skylight, door and window glazing;
- Increased soil particulates entering the house; and
- Damage to vegetation, detached limbs and uprooted trees, especially if soils are saturated.

A severe hail event presents the following risks of damage to the MH&G:

- Impact damage to skylights and window glazing;
- Impact and abrasion damage to the roofing membrane;
- Blockage or clogging of roof drains; and
- Damage to vegetation.

Lightning strikes present the following risks to the MH&G:

- Loss of electrical power to the site;
- Loss of the back-up power generation system;
- Damage to, or loss of, vital intrusion detection, fire detection, and information technology systems;
- Initiation of a building fire; and
- Loss of trees

9.4 SITE SOILS, GROUNDWATER, AND SEISMICITY

The soils in the vicinity of a building can exacerbate risks to the building and/or its contents. Soils can be an important source of airborne reactive and abrasive particulates as well as moisture in liquid and vapor states.

Web Soil Survey

The Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture provides a broad assessment of the soils at the MH&G, identifying the major soils as (from east to west):

- UenA Urban land-Fox complex
- RqaG Rodman sandy loam
- SldAH Shoals silt loam
- RtxAH Rossburg silt loam
- GccAH Genesee loam
- EcyAH Eel loam
- SuoAH Stonelick fine sandy loam[18]

The soil properties for the Urban land—Fox complex around the House and the Rodman sandy loam, exposed on the slope west of the House, are representative of the soils underlying the MH&G. Table 9.5 provides pertinent soil properties for these two soils.

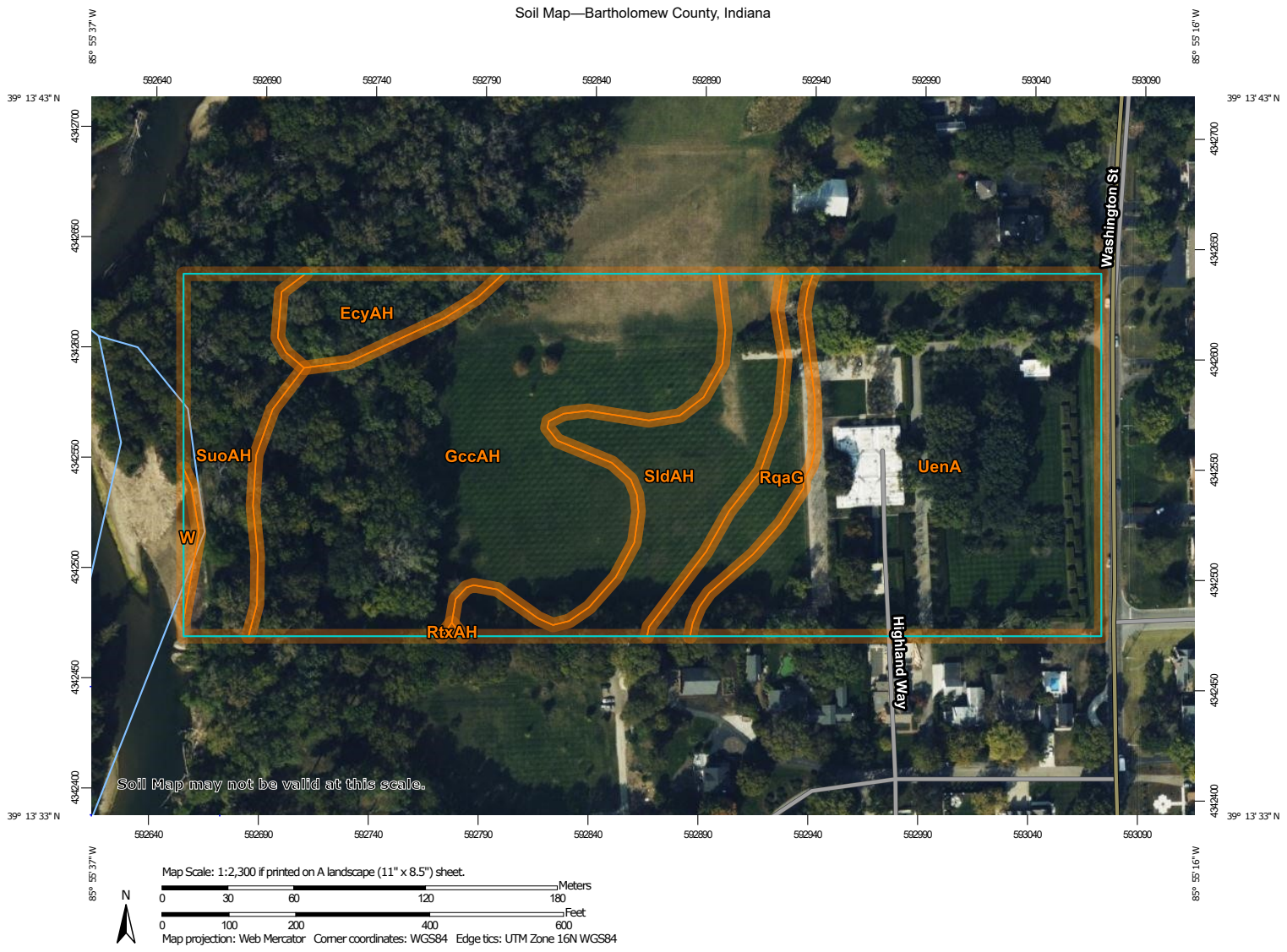

Fig. 9.1 Soil Map of Miller House and Garden. Credit: Web Soil Survey by NRCS, https://websoilsurvey.sc.egov.usda.gov

Table 9.5 Representative Soil Properties at east end of Miller House Site[19]

Property	Urban land-Fox complex (House)	Rodman sandy loam (slope)
Typical profile	0 to 8 inches: loam 8 to 22 inches: clay loam 22 to 33 inches: gravelly clay loam 33 to 60 inches: stratified coarse sand to very gravelly sand	0 to 10 inches: sandy loam 0 to 18 inches: very gravelly coarse sandy loam 18 to 80 inches: stratified very gravelly loamy coarse sand to extremely gravelly loamy coarse sand to verygravelly sand
% Clay—sand—silt(0 to 96 inches deep)	Not reported	5.1%—80.6%—14.3%
Natural drainage class	Well drained	Excessively drained
Capacity to transmit water (Ksat) at 0 to 96 in. deep	Moderately high to high 0.60 to 2.00 inches/hour	High 2.0 to 6.00 inches/hour
Corrosion risk to concrete	Not reported	Low
Corrosion risk to steel	High	High
Frost heave risk	Not reported	Low
Shrink/swell risk	Not reported	Low 1.5% linear extensibility
Soil slippage risk	Not reported	Medium
Wind erodibility	Not reported	High, 86 tons/acre/year

Geotechnical Investigation
Records of pre-construction soil investigations for the MH&G have not been located. Construction testing of soils and compaction have not been found.

Groundwater
The Web Soil Survey does not report the potential for groundwater problems in the eastern (elevated) third of the site. However, the subsoils of the slope from the House precinct to the Meadow and below the House can easily transmit large volumes of water.

The water transmissivity of the slope soils becomes a potential issue if the Meadow west of the slope is flooded, resulting in seepage into the soils through the face of the slope. During a sustained flood event, water may saturate the soils below and around the House Basement, resulting in leaks, and possibly damage to equipment or materials stored in the Basement.

Seismicity
The Indiana Geological and Water Survey at Indiana University reports that large magnitude seismic events at two major faults—the New Madrid fault in southeastern Missouri and the Wabash fault along the Illinois/Indiana border—can result in ground movement and building damage in parts of southern Indiana.[20] Figure 9.2 contains a map published by the Indiana Geological Survey in 2015 showing 42 earthquakes magnitude 3.0 or greater with epicenters in Indiana between 1817 and 2012, including a 4.9 earthquake in Columbus on August 19, 1891.[21]

The *ASCE 7 Hazards Design Tool* (Appendix H) identifies the appropriate seismic design factors for this location.[22]

Risks from Site Soils, Groundwater and Seismicity
Based on the Web Soil Survey, the site soils present the following risks to the MH&G:

- Low risk of shrink/swell damage.
- Risk of erosion or loss of soil support at edges of the terrazzo terrace surrounding the House when the soil is not confined.
- Efficient transmission of flood water through the slope at the edge of the House precinct into the soils under and surrounding the Basement, leading to Basement leaks or flooding.
- High risk of corrosion of underground piping or buried metals.
- Indeterminate risk of cracking, displacement or detachment of window and door glazing or interior and exterior stone wall panels due to lateral motion in a seismic event.

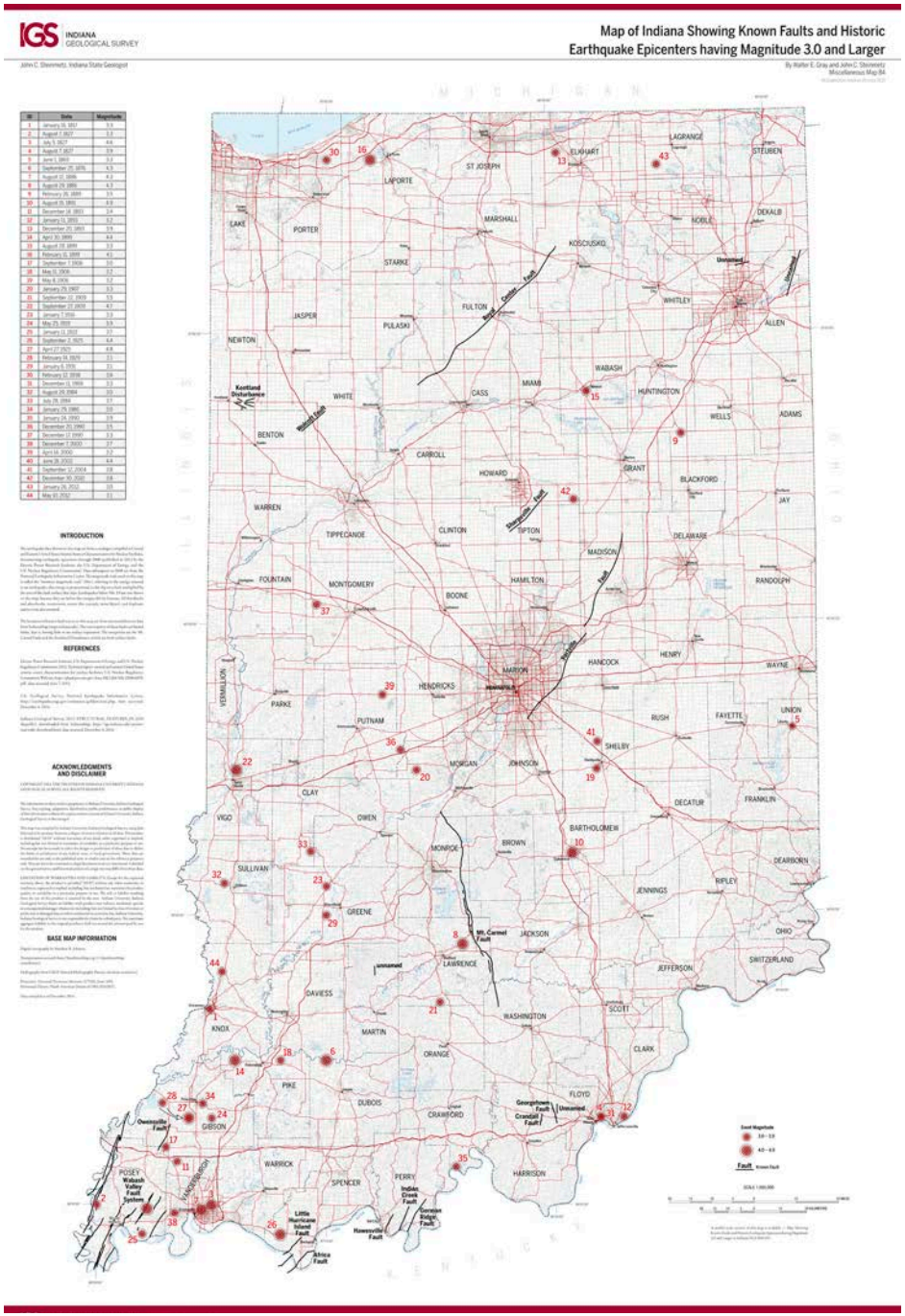

Fig. 9.2 Earthquakes with Epicenters in Indiana 1817–2012. Credit: Indiana Geological and Water Survey (Appendix I) https://igws.indiana.edu/bookstore/details.cfm?Pub_Num=MM84

9.5 FLOODING AND THE FLATROCK RIVER

The site is within the area covered by the 2013 *Columbus Flood Risk Management Plan*, updated in 2020, administered by the Columbus Indiana-Bartholomew County Planning Department.[23] According to the website for the *Plan*:

> With one-third of the City of Columbus planning jurisdiction located in a floodplain, flooding is the primary natural threat to the community. The Columbus Flood Risk Management Plan is intended to address all aspects of that flood risk. The Plan assess [sic] the threat from local streams, provides the background information for the companion Flood Response & Evacuation Plan, evaluates opportunities to mitigate flooding risks for specific streets and neighborhoods, and identifies regulatory actions that could prevent the flood risk from becoming worse.[24]

Exhibit 40 of the *Plan* indicates that a portion of Washington Street south of the MH&G and Garden is susceptible to flooding from the river.[25] Since Columbus Fire Station #1 is south of that flood zone, a flood could impact rapid fire department access to the Miller House.

The Federal Emergency Management Administration (FEMA) *Flood Insurance FIRMette* (Figure 9.3 and Appendix J) locates the eastern third of the MH&G site in Zone X (unshaded), which FEMA defines as an "area of minimal flood hazard," usually depicted on Flood Insurance Rate Maps [FIRMs] as above the 500-year flood level.[26] However, the westernmost portion of the site is located in a regulated floodway and the slope between the Meadow and the House is in a Special Flood Hazard Area.

The *FEMA Flood Insurance FIRMette* locates the condenser for the air conditioning system for the MH&Gin the Special Flood Hazard Area Zone AE near the line of the Floodway Area. The *FIRMette* locates the emergency generator in the Special Flood Hazard Area Zone AE near the Zone X line. Two fuel tanks are located in the Special Flood Hazard Area Zone AE and do not appear to be anchored or protected from flooding.

It should be noted that FEMA *Flood Insurance Map Panel* 18005C0131E was last issued in 2014. Several panels covering the City of Columbus have preliminary updates as of 2021, but the panel containing the MH&G has not been updated.[27] FEMA Flood Insurance Maps do not necessarily address the potential of higher flood elevations due to climate change and more intense rainfall, failure of water control structures or increased surface water runoff from upstream development.

The *Columbus Flood Risk Management Plan* and the 2018 Annual Progress Report do not identify any cultural, architectural or heritage sites, including the MH&G. The omission of the MH&G, as well as other historic architectural resources in the city, is a serious oversight, because these properties are potentially vulnerable community assets, regardless of ownership status. FEMA publication 386-6 *Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning* specifically addresses the need and methodology to address historic buildings in a State, County or Local Hazard Mitigation Plan.[28]

Risks Associated with Flood

Although the Miller House and Garden is not located in a flood hazard zone, the close proximity to the edge of the 500-year flood limit is sobering. Identifiable risks to the MH&G from flooding of the Flatrock River are:

- Failure of the air conditioning condenser which would result in the inability to control temperature and relative humidity in the House. This could result in rapid temperature and RH fluctuations and rapid germination of mold in a post storm/flood environment.
- Failure of the generator or generator cables.
- Fuel spill/leakage from the fuel storage tanks near the Barn.
- Saturation of soils surrounding the House Basement.
- Flooding of the Basement Mechanical Room and Basement Collections Storage if floodwaters reach the grade-level fresh air intake of the heating, ventilating and air conditioning system.
- Flooding of the basement if floodwaters reach the grade-level combustion air intake of the boiler.
- Delayed access to the site by law enforcement, rescue, or firefighting personnel stationed further south on Washington Street.
- Inadequate emergency response due to omission of the MH&G from the *Columbus Flood Risk Management Plan*.[29]

9.6 ROOF DRAINAGE RISKS

The roof is divided into 25-five individual zones, each of which is served by a single drain. Nine large roof areas are above interior spaces and the Carport and are completely impounded by skylights. Sixteen smaller roof areas are cantilevered above the perimeter plinth and are bounded on two or three sides by skylights and the parapet beam at the roof edge. Storm water for each roof zone is drained from each roof sump by lateral piping located in the under-roof cavities formed by the roof deck and the ceiling/soffit below. The lateral drainpipes discharge to interior downpipes, then to lateral cast iron drainpipes in the soil below the floor slab, discharging to a perimeter drain at the edge of the terrazzo-surfaced plinth.

Climate data indicate that the rainfall intensity of an individual event can be high. Climate change projections for the Columbus region indicate that rain event intensities will increase with time, compounding capacity issues with existing drainage systems. Because there are no provisions for secondary or overflow drainage of each of the twenty-five roof zones, overloaded drainage piping or debris obstructed sumps or piping can result in water leaking or flowing into the skylight cavities and the ceilings/soffits or spaces below.

High rainwater flows from the roof drainage might overload the buried drainpipes below the floor or at the plinth perimeter, saturating or displacing soils under the floor slab or floor slab extensions at the plinth.

9.7 FIRE RISKS

Fire Service and Water Supply

The MH&G are served by the City of Columbus Fire Department (CCFD), which has 95 uniformed firefighters and six active fire stations. The two stations closest to the House are Station #1 and Station #2 (Table 9.6).

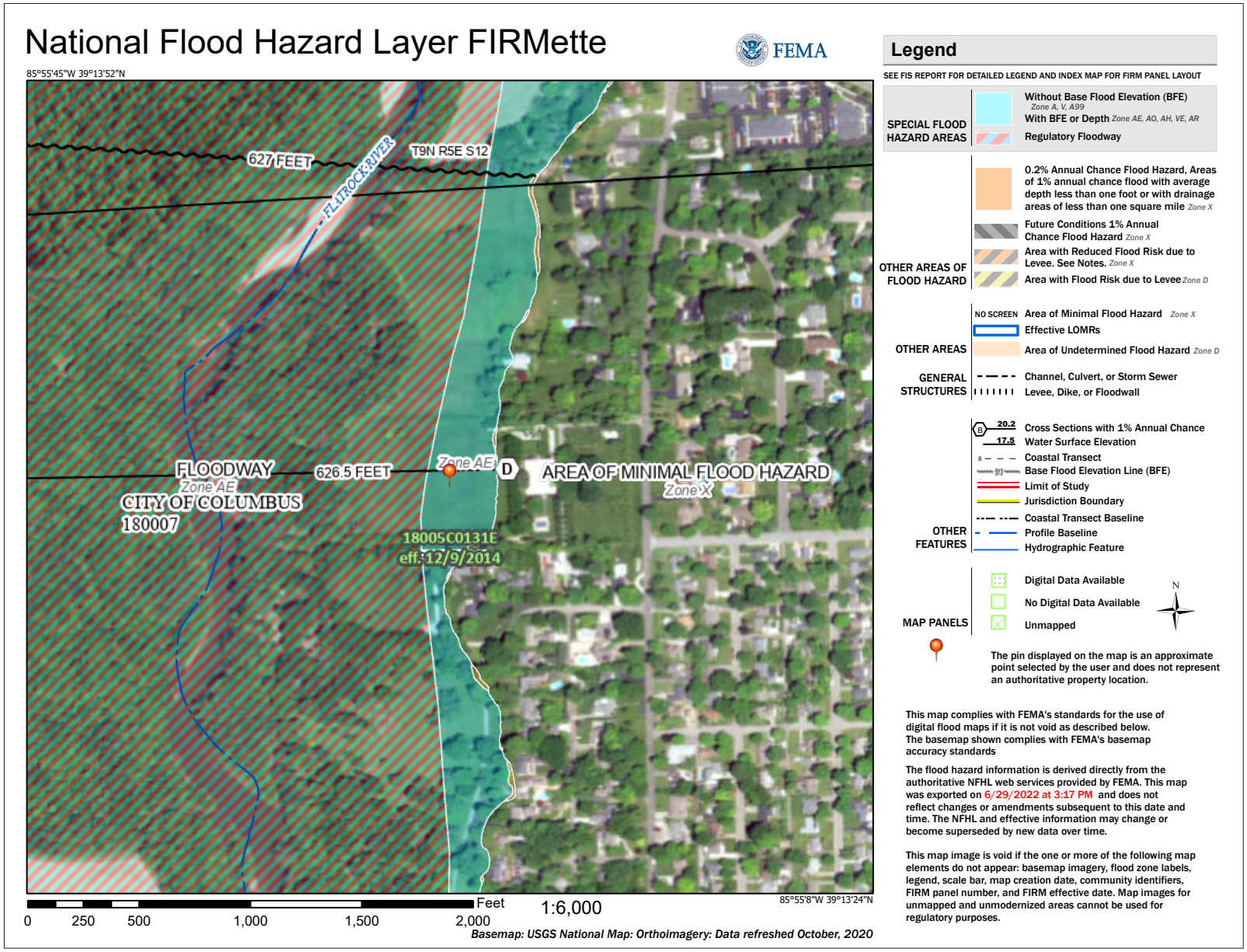

Fig. 9.3 National Flood Hazard FIRMette. Credit: FEMA

Table 9.6 Columbus Fire Department Stations serving Miller House and Garden[31]

Station Number	Address	Distance & Direction	Available Apparatus
1	11th & Jackson Streets	1.3 miles south	2014 1500 gpm pumper 2010 1500 gpm pump w. 100 ft tower 1997 Heavy rescue 2004 1500 gpm reserve pumper
2	2376 Arnold Street	3.5 miles northeast	2005 1500 gpm pumper 1998 1500 gpm pumper/1000-gal tanker 1989 1250 gpm pumper 1998 Heavy rescue

The Insurance Services Office (ISO) rating (1-highest to 10-lowest) for the CCFD was 3 as of December 2016.[32]

The 911 Dispatch Center in Columbus dispatches the fire department.

Fire hydrants for fire-fighting apparatus are located at:

- The northeast corner of Riverside Drive and Highland Way, approximately 390 feet from the Miller House via the south gate and driveway;
- The east side of Washington Street, approximately 50 feet north of the garden lane gate and a total of 450 feet from the MH&G via the garden lane; and,
- The northeast corner of Washington Street and 27th Street, approximately 260 feet from the House via the east lawn.

Access to the site by fire-fighting apparatus is limited to the two driveways. Access to the exterior or interior on the west and north sides of the House will require hose lays. Traffic congestion from sightseers or on-street residential parking on Highland Drive may impede access by the Fire Department.

The Columbus Fire Department does not have a site-specific fire-fighting plan for the structures and adjacent large trees of the MH&G.

Fire at the Miller House and Garden

The MH&G has the following provisions for fire prevention, detection, and protection:

- Smoke detection, consisting of an automatic, centrally-monitored fire detection and alarm system with five ceiling-mounted smoke detectors on the first floor;
- Five hand-held fire extinguishers deployed in concealed spaces on the first floor and one in the basement. The first floor fire extinguishers had current inspection tags, but the tag on the basement unit was dated 2008.

Based on the air flow schematics for the HVAC controls, the return air ducts do not have smoke detectors which would provide alarm notification and fan shutdown upon smoke detection. The supply and return air ductwork in the Basement does not have smoke dampers.

The Basement is not monitored for explosive gases.

The House is not equipped with an automatic fire suppression system.

MH&G is constructed with many non-combustible or fire-resistant materials, including concrete, structural steel, concrete unit masonry, and interior and exterior stone panels. Combustible materials consist of wood and laminate finishes, window treatments, floor coverings, furnishings and contents.

Although the MH&G has many characteristics that are beneficial with respect to fire, the House also has the following risks of damage from fire, smoke, or water used in firefighting:

- The interiors and furnishings that are character-defining elements (CDE) will be at risk of severe damage from fire-fighting operations. A site-specific fire-fighting plan with specific provisions for protection, recovery, and salvage can mitigate these risks to the collections.

- The natural gas piping to the boilers and hot water heater in the basement may leak, resulting in a fire or explosion.
- The functionality of the electrical circuit breakers in the event of an electrical overload is unknown.
- Smoke from the initial stages of a fire may migrate into the skylight cavities, delaying smoke accumulation at the ceiling level and detection by the ceiling-mounted smoke detectors.
- Smoke from a fire on the first floor may be recirculated by the HVAC system without detection.
- Smoke from a basement fire may migrate to first floor spaces through HVAC ductwork due to lack of smoke dampers in the ducts.

9.8 MECHANICAL, PLUMBING, AND ELECTRICAL BUILDING SYSTEMS RISKS

Based on observation of the exposed and accessible portions of the systems, the risks associated with the Mechanical, Plumbing, and Electrical building systems are as follows:

Mechanical Risks

There are two distinct methods of maintaining a comfortable interior environment in the MH&G: a system of ducts for delivering and recirculating conditioned air to the rooms, and a radiant heating system of hot water piping in the concrete floor slab.

The ducted air system includes humidifiers to prevent drying and embrittlement of the collections materials during winter. If the humidification level is too high, either due to incorrect set point or control system failure, there is a risk that condensation will occur in concealed cavities and/or exposed surfaces of the building during low winter temperatures.

Significant portions of the ducted air system are encased in “4-inch thick lightweight aggregate concrete” below the 6-inch think structural concrete floor slab.[33] The duct materials include vitreous tile and sheet metal. The sheet metal is used at elbows, transitions and to penetrate the structural and finish floor slabs at risers for overhead ducts and in-floor supply grilles. If the embedded sheet metal duct has corroded due to interior condensation or soil/concrete moisture, there is a risk that particulates from corrosion, concrete degradation or salts will be discharged into the interior spaces with the supply air. Abrasive or reactive particulates can damage surfaces and collections.

The radiant floor heating consists of rows of ¾ inch diameter wrought iron pipe in five banks of piping on 16- or 24-inch centers embedded in the 3-inch-thick concrete/terrazzo finished floor slab. The total length of pipe is approximately 2,354 feet according to the original drawings.[34] Dry concrete provides an alkaline environment that reduces the corrosion potential for iron and steel. However, if the concrete is moist, corrosion of the external surface of a pipe will accelerate and will crack the concrete due to expansive pressure from the corroded pipe. Internal corrosion of the pipe will occur if the pipe contains an air/water mixture without any anti-corrosion additives. If the piping has been drained, enough residual moisture will remain to create internal corrosion. Internal corrosion will ultimately penetrate the pipe wall, releasing water into the concrete, leading to external corrosion. The piping for the radiant floor heating system poses a risk of cracking to the finished concrete/terrazzo floor slab.

Plumbing Risks

The plumbing system in the MH&G provides hot and cold water to five full-size bathrooms, one half-bath, two laundry areas, the Kitchen and the Dining Room. According to the plumbing drawings, the supply piping is Type K soft copper. The sanitary waste piping is cast iron. Supply piping and waste piping are routed below the first-floor slab and are not accessible except where exposed in the Basement or at connections to plumbing fixtures.

The plumbing fixtures are supplied by three piping loops (cold water, hot water and well water). Originating and returning to the Basement, the supply piping loops are routed in the floor slab through the southeast, southwest and northwest room groups.

At present, only two bathrooms are in service, the bathroom for the Guest Bedroom and the Boys’ Bathroom, both on the south side of the House. Taking a plumbing fixture out of service by closing the fixture supply valve(s) does not reduce the risk of a leak in the piping loop below the slab, it only reduces the risk of a leak from the fixture or from the exposed fixture supply line.

The water supply and waste piping in or below the floor slab runs through a significant portion of the House, beyond the two bathrooms still in service on the south side of the house. Small slow leaks might arise from cracks caused by thermal expansion/contraction. Leaks due to corrosion in the copper supply do not have a high likelihood unless there are mixed metals (galvanic corrosion) or exceptionally aggressive concrete or site soils.[35] If a leak occurs in the concealed piping below the floor surface, it will not be noticed until the floor slab is saturated and can be observed as a damp stain in exposed flooring or mold under a floor covering.

A leak in the exposed piping in the basement could result in damage to the mechanical and electrical systems and the collections in the storage room if undetected.

Electrical Risks

Electrical system risks are discussed under risks associated with fire or flood.

9.9 PEST RISKS

The verdant landscape of the MH&G provides an inviting habitat for a wide range of avian and terrestrial pests that may pose risks to the house. Risks associated with these pests include:

- Insects and vermin may infest organic materials in the interiors and furnishings, especially if food or live plant materials are permitted in the House. The Newfields integrated pest management (IPM) program for museum collections can be effective in managing this risk.
- Birds may contribute nesting materials and carcasses to roof litter, clogging roof drains.
- Birds may collide with glass windows and doors, resulting in injury and upsetting visitors.
- Burrowing animals, such as groundhogs, may destabilize the slope between the House precinct and the Meadow, or at the edge of the terrazzo plinth.
- Birds and bats may deposit nesting materials or waste in gaps in the building envelope, such as the voids behind the slate panels.
- Insects and microorganisms may infest plants and trees. This risk will increase with species migration due to climate change.

9.10 USE AND VISITATION RISKS

The MH&G supports the following uses and activities:

- Supervised public tours of limited size and frequency, and special private tours.
- Infrequent private dinners.
- Security monitoring station and equipment in the Guest Bedroom, which is also used as work and meeting space by off-site staff.
- Maintenance and preventive conservation activities and storage of related equipment and materials.

It is fortunate that the Greenhouse/Office and the Barn at 2800 Riverside Drive provide office space and storage space for staff and materials that are essential to the day-to-day care and operation of the site without encroaching on the MH&G. It was beyond the scope of the CMP to assess the capacity and suitability of these spaces for current and future staff needs.

- The risks associated with use and visitation at the MH&G are:
- Wear and tear on floor materials and at door openings.
- Visitor contact with interior materials and furnishings which can result in scarring, abrasion, corrosion, tearing or fracture.
- Unobserved movement or theft of small objects by visitors.
- Code-required improvements or upgrades to the House or the site for universal access, life-safety, or sanitary facilities due to the use of the House as a museum (assembly or business use) rather than as a private residence. These requirements could potentially physically and/or visually impact the integrity and authenticity of the MH&G and its site.
- Site visitation which would conflict with the predominantly residential character of the area, perhaps due to the frequency or type of vehicular traffic, deliveries, number of people or noise from events.
- General antipathy due to the perceived encroachment of the use of the MH&G on the neighborhood or adjoining neighbors, resulting in negative news coverage or vandalism.

9.11 SITE MANAGEMENT RISKS

Staffing

Stewardship of built cultural heritage requires on-site human resources to handle known workflows for management, interpretation and preventive conservation of the building, landscape and collections. These human resources must be sufficiently trained about conservation philosophies and principles as well as maintenance standards and knowledgeable in the history of the site, including the history of stewardship.

At the time of this report's completion, Newfields provides the following staffing at the MH&G:

- One Site Manager residing in adjacent property and providing full-time 24/7 supervision of the site.
- One full-time Head Groundskeeper.
- Three seasonal, full-time employees for landscape maintenance.
- One full-time Security Guard performing housekeeping, collection maintenance and greeting/escorting tours.
- Two part-time Guards on weekends and vacations.

Newfields also provides off-site support in the following full-time positions with responsibilities for collections/properties in Indianapolis:

- Director of Historic Preservation
- Curator of Design & Decorative Arts

Collaborative support is provided by Newfields' Ruth Lilly Director of The Garden and Fairbanks Park and Tom and Nora Hiatt Director of Horticulture.

Institutional administration, finance and accounting, human resources administration, media, and development for the MH&G Garden are performed by Newfields in Indianapolis.

Ideally, the Site Manager's position at the MH&G should be the execution of supervisory/administrative responsibilities. Examples of the Site Manager's responsibilities include work planning and day-to-day direction for site staff; coordinating service personnel and contractors; and coordinating with Museum departments such as historic sites, human resources and finance. Currently, the MH&G is not fully staffed, and the Site Manager must perform work ranging from lawn care to supervisory and administrative duties.

Preventive Conservation and Work Planning

Newfields' 2017 Historic Preservation Policy states, "Preventive maintenance inspection checklists and walk-throughs are conducted on a regular basis by staff and external consultants to assess needs and priorities (Appendix F Annual Inspection Sheet for Historic Properties)."[36] A single building checklist has been developed for Newfields' various properties, which must serve a very diverse group of resources, from the French chateau style Lilly House to the Modernist Miller House. Developing a checklist or checklists tailored specifically to the MH&G and other properties there will provide better prompts for the staff carrying out the work, and capture more consistent information for planning, budgeting and analysis.

Currently, the building checklist is used to document observations of conditions at the House. The Director of Historic Properties notes that he typically only has time to fill out the checklist once a year for the properties at the Newfields campus. He indicates that surveys twice a year would ensure that summer and winter conditions are considered.

Incidents resulting in damage at the MH&G are reported by the Site Manager but Newfields does not have a formal procedure for documenting incidents of damage or loss to the building, landscape or collections which would address damage inspections to be performed and recommendations of measures to mitigate recurrence.

There is an "Annual Maintenance List" for the MH&G (Appendix K), but no day-to-day or week-by-week lists of activities for grounds or building staff. Some sense of seasonal grounds maintenance is provided in the 2019 interview with Ben Wever in *Landscape Architecture Magazine*.[37] The various workflows for which staff are responsible should be well documented, including when the work has been executed.

Documentation

Stewardship and conservation of a resource are informed by records of past work and events. The extensive records pertaining to design, construction and maintenance of the site during ownership by the Millers, now accessible in the Newfields Archives, have been invaluable in the research necessary for this CMP.

Currently, the Director of Historic Properties maintains files concerning work on the buildings and landscape, but these records are not catalogued and archived at Newfields.

Work undertaken on the buildings or landscape should be documented with information at a level of detail appropriate to the scale of the work or intervention, and the date, nature, scope, cost and firm responsible for the repairs should be documented, with “before” and “after” photos. The documentation should be digitized, catalogued, and archived by Newfields on a regular schedule.

Records of work should be stored digitally in a central location, so that they can be accessed by staff both at the Miller House and Newfields and so that records are backed up and not lost in the event of damage or fire. Records of past work will inform the development of appropriate preventive conservation measures.

Risks Associated with Management
Risks associated with management of the site include:

- Loss of key site personnel without a plan for development and training of a back-up or replacement.
- Persistent understaffing at the site will lead to failure to undertake and complete preventive conservation and maintenance activities, resulting in shortened service life of architecturally significant materials or assemblies.
- Persistent understaffing at the site will prevent planning for conservation projects, resulting in underestimating of the future project scope and cost, and inadequate capital for execution.
- Failure to document and archive records of work undertaken at the MH&G will result in voids in the historic record and will undermine the ability of future stewards to make informed decisions about appropriate and effective treatments, repairs, and replacements in the future.

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10
Conservation Policies and Recommendations

10 CONSERVATION PHILOSOPHY AND POLICIES

10.1 GOALS AND ASSUMPTIONS

A key goal of any Conservation Management Plan (CMP) is to articulate an overall conservation philosophy that will guide management decisions at every scale, in particular the decisions that relate to the Character-Defining Elements (CDEs) of the buildings, landscape, and collections. The Miller House and Garden's (MH&G) conservation philosophy is based on the overall values, design, experience, and interpretation of the place articulated in previous chapters of the CMP. It also recognizes the contexts of the property, especially the long history of careful stewardship first by the Millers and then by Newfields and the ongoing challenges of managing such a highly significant and refined site in a sustainable manner.

The philosophy is conceived to be fully consistent with the current mission of Newfields: "To enrich lives through exceptional experiences with art and nature."[1] Stewardship heads Newfields' statement of its mission as a public-serving institution, along with Inclusivity, Service, and Excellence: "We create a vibrant Newfields for current and future generations. We accomplish this with a sustainable financial model, a well-maintained campus, well stewarded collections, and environmentally-responsible business practices."[2] Sustainability is the operational heart of the CMP policies and also resonates clearly with Newfields' mission. Sustainability in this sense relates to all aspects of MH&G's care, operations, and public benefit—cultural and historical meanings, natural systems, educational functions, and financial resources.

From the outset, Newfields envisioned the CMP for the Miller House and Garden (MH&G) as an opportunity to position one of the most iconic examples of a domestic Modernist place not just as an historic property managed by the Museum, but as an example of stewardship for Modernist sites. The Getty Foundation recognized this potential in awarding a grant in the same round to North Christian Church. The understanding was that planning for both sites would provide insights to benefit the remarkable Modernist heritage of Columbus, a place of architectural pilgrimage that continually inspires film, research, and education.

The conservation philosophy and policies assume the site will continue to be used as a public, limited-visitation museum space under Newfields' ownership and management. While the CMP policies and recommendations are specific to the management context of Newfields, they would apply in principle to any future ownership structure. As Newfields continues to own and steward the site for the foreseeable future, partnerships with other organizations may help advance the MH&G's stewardship and implement other aspects of the CMP through joint programming, events, educational activities, or other partnerships. This important topic is addressed in a separate memorandum to Newfields, titled "Exploring Strategic Partnerships").

10.2 CONSERVATION PHILOSOPHY

The design and execution of the buildings, interiors, and landscapes at the MH&G were the result of an extraordinary vision and partnership which is at the core of its national and international significance. Since completion, the evolution and maintenance of the site has been remarkable on many levels.

The overall conservation philosophy for the MH&G is based on several fundamental, widely accepted management and decision-making approaches for historic sites. The philosophy acknowledges the unique, highly integrated original design philosophy of the site. It centers the deeply interwoven aspects of significance connecting the buildings, interiors, and landscapes with the Millers and their design team. It appreciates the integrity of the site, due to decades of careful conservation management.

Preventive conservation takes priority as an overarching principle of the philosophy. Conservation interventions—whether repairing, preventing or instigating change to the site physically, functionally, or managerially—are intended to complement it. Building on these core principles, more specific points of the conservation philosophy are presented as a series of complementary policies, not a hierarchical list of priorities.

10.2.1 Preserve significance while embracing adaptability of the kinds that improve performance or mitigate or reduce risk. Use a "tolerance for change" approach to guide conservation and adaptation.

This policy builds on the history of the site's continued evolution, first as a residence, then as a historic site/museum environment. Sustaining the cultural significance of MH&G will require active management of change. This will require not simply preventing change but actually introducing change in some instances. Instigating change to the place may be warranted, for example, in response to climate change, or addressing the service life of building assemblies or lifespan of plantings.

The conceptual heart of the conservation philosophy is the site's cultural significance and integrity—the ability of the place to convey its cultural significance materially and experientially through the Character-Defining Elements (and their relationships to each other). A "Tolerance for change" approach signals that some material changes should be expected to occur and can be designed without diminishing the significance and integrity of the site.

A tolerance-for-change approach accepts that there are many instances where change will not adversely impact cultural significance and integrity and can even strengthen them. This contrasts with a more typical, traditional preservation policy approach based on defined appropriate "levels of intervention" (preservation, rehabilitation, restoration, reconstruction) for spaces and elements. This is the type of philosophy and policy articulated in the current Historic Preservation Policy for Newfields.[3] The level of intervention approach is defensive. It assumes that material condition is always the most important index of significance (though significance might reside more strongly in use, function, or meaning) and it regards any departures from "original" material condition as a diminishment of significance. A tolerance-for-change approach departs from the accumulated or evolved state of the site, imagines change as a constructive force, and gives more weight to non-material expressions of cultural significance like uses or experiences.

It should be noted that there is not an either-or choice between tolerance for change and levels of intervention approaches. "Rehabilitation" (or "adaptive reuse") as a defined level of Federal preservation policy, for example, captures the idea of tolerance for change: embracing material changes to a building, within certain tolerances, required to accommodate a new use. Likewise, tolerance for change decisions often contemplate the benefits of "preservation" or "restoration" interventions very focused on preventing change to material integrity. But the different assumptions and attitudes of the two approaches present a philosophical choice.

Tolerance-for-change framing of conservation decisions is particularly well-aligned with cultural landscape theory, which holds that change is inherent to the nature of buildings and landscapes of all types. It accepts the realities of past change and welcomes opportunities for future change, whether imposed by humans or resulting from "natural" decay. Tolerance must, of course, be interpreted in the context of management by professionals, be rooted in all the site's documentary record, and stay faithful to the analyses of values-centered conservation – in particular, determinations of cultural significance and character-defining elements.

In reference to MH&G, the three design domains of the site—architecture, interiors, landscapes—each change at different rates, in different ways, according to different internal and external influences. Therefore, the tolerances for change in each domain will differ:

- Architecture: The House has a very low tolerance for change, given the careful and complex interplay of architectural elements, systems, and materials to produce particular spatial experiences (of light, of function, of the interplay of color and texture etc.; e.g., skylight assemblies; entry sequence, view axes). The extremely high significance of the original design would render it nearly impossible to contemplate, for example, a new type of roof system or any rearrangement of interior partitions. Modest tolerances could be afforded to less visible, more reversible changes implemented to accommodate its evolved function as a house museum, for instance adding protective films to large glass panels.
- Interiors: As noted by Shelley Selim and in Sections 3 and 8, "as the Millers acquired new artworks, old ones were shifted to other areas in the house or moved to storage (e.g. the *Pichwai*, which was moved into the den and replaced by the Monet in

the living room)...and, of course they also rotated things seasonally."[4] While interior finishes are part of the architectural treatment, and thus less tolerant of change, some change in the position of individual objects can be tolerated. Alterations would be acceptable as long as they: (1) reinforce the architectural relationships of the original design (i.e. character-defining features); (2) remain authentic to the Millers/ Girard's vision for the home (which shifted somewhat over time); (3) are necessary for long-term conservation of the character-defining features or objects; or (4) are essential to supporting the rehabilitation of the house into a museum space (examples of tolerable change would be historical ones, such as resetting the Dining Table or displaying holiday creches).

- Landscape: Individual plant and material elements are subject to change and even wholesale replacement; this has been the tradition at MH&G from the earliest years of the Millers' residence, responding to unanticipated biotic changes or site conditions. Replacement of plants or plantings (entire elements such as an orchard grid, ivy bed, or arborvitae hedge) is tolerable as long as the spatial arrangements and experiences of the original design are reinforced, and species are chosen to reinforce current knowledge of ecological performance.

These "tolerances for change" are based on research into the history, evolution and design thinking reflected in the place as the Millers inhabited it, and guided by the team's analysis of values, cultural significance, and current conditions, and how these qualities are expressed materially, spatially and experientially. The plan calls for positive conservation decisions and actions to be taken while also identifying opportunities to adopt, enact and design change that strengthens the conservation and interpretation of the site's cultural significance to future audiences while contributing to sustainable management.

10.2.2 Integrate preventive conservation across all decisions related to all aspects of the care, management and interpretation of MH&G.

Establishing an overarching policy of preventive conservation and maintenance is equally important to determining needed conservation interventions. A forward-looking, sustained policy of preventive conservation and maintenance should be continued and expanded across all aspects of MH&G and its management.

Preventive conservation is defined by the International Council of Museums Committee for Conservation as "all measures and actions aimed at avoiding and minimizing future deterioration or loss. They are carried out within the context or on the surroundings of an item, but more often a group of items, whatever their age and condition. These measures and actions are indirect—they do not interfere with the materials and structures of the items. They do not modify their appearance."[5]

Preventive conservation differs from what is traditionally considered building maintenance "as it recognizes that standard approaches and strategies to understand and maintain existing structures do not align with the specificities of heritage values, historic interventions and additions to a building, local building technologies and cultural context."[6] By identifying potential causes of deterioration and addressing them early, it seeks to avoid or minimize "reactive treatment patterns, unforeseen detrimental damage and additional resource investments."[7]

10.3 POLICIES RELATED TO THE BUILDINGS

Many of the conservation policies proposed for the architecture of the MH&G are closely inter-related. It is more useful to think of a circular, ecological set of relationships between the policies, as opposed to reading them as a linear list of distinct proposals.

10.3.1 Identify spaces with higher tolerances for change.

The remarkable transparency, visibility and interconnectedness of Character-Defining Elements related to the Miller House proper unfortunately means that there are relatively few spaces with high tolerance for change:

- Non-visible elements with slightly higher tolerances for change include: top-of-roof components of the roof system; sub-surface support and fastening systems, such as for terrazzo and slate slabs; and mechanical systems located in the basement.
- Most storage spaces themselves should not be altered, since they convey important stories about the precision with which

the Millers and the design team specified needs and organized them to support living in the House. However, the shelving and drawers within them could be appropriately adapted for collections storage, as many already have. Cold Storage should not be altered, but might be adapted for collections storage with only minor alteration for environmental management.

- Spaces associated with service, such as the Maid's Suite and its passage have relatively low tolerance for change, although these spaces have been altered. In the future, they may be important to interpreting the relationship of the family and the household staff. The hidden nature of this space, including the direct exterior access and concealed circulation—a horizontal "back stair"—are important design features that communicate ideas about class and service.

10.3.2 Develop a conservation strategy that balances environmental needs of the collections with preservation of the historic building.

The MH&G was designed to provide an interior environment suitable for human thermal comfort, though for decades it contained significant works of art. The House building envelope cannot maintain the same control of interior relative humidity as a modern purpose-built museum without risking damage to the historic building fabric, but it can maintain conditions that present a low risk of damage to many collections materials. See a detailed discussion of this dynamic in Section 6.14, Interior Environmental Management and Hygrothermal Performance of the Building Envelope.

In terms of the House, the careful integration of architectural design, interior architecture, and collections/decorative arts can be balanced through application of well-established philosophical and technical guidance in the conservation field.

The competing conservation needs of the building and the objects contained in the building are common to historic buildings and the philosophical approach for balancing these competing needs is found in the *New Orleans Charter for the Joint Preservation of Historic Structures and Artifacts*.[8] It is the product of two symposia held in the early 1990s: Museums in Historic Buildings held in Montreal, Quebec (1990) and New Orleans, Louisiana (1991), and co-sponsored by the American Institute for Conservation of Historic and Artistic Works (AIC) and The Association for Preservation Technology International (APT). This Charter has been officially adopted by the Board of Directors of both AIC and APT, and was subsequently adopted by the National Conference of State Historic Preservation Officers at its Annual Meeting in Washington, D.C. in March 1992. Included in full in this report's Appendices, the Charter states that "appropriate preservation strategies should be guided by the specific needs and characteristics of the historic structure and artifacts."[9]

In order to implement the philosophy of the New Orleans Charter, Newfields should follow the methodology set out in Chapter 24, "Museums, Galleries, Archives and Libraries," of the *2019 ASHRAE Applications Handbook*.[10] The 2019 version of the "Museums" chapter was written by a team of conservators, conservation scientists, architects and engineers, and museum professionals. It presents a step-by-step decision-making process for multi-disciplinary stakeholders to balance the multiple needs of environmental management in new and historic buildings containing collections. The chapter also includes technical guidance on environmental risks to both collections and buildings, as well as an ideal decision-making process is summarized in Figure 1 of the document (which is included in the Appendices, Section 11).

10.3.3 Monitor and document conditions and their rates of change on a regular basis.

As noted in *Preventive Conservation*, edited by Aziliz Vandesande, Els Verstrynge, and Koen van Balen, preventive conservation aims at implementing minimum interventions, the least destructive of all interventions which inevitably occur in built heritage conservation, through a continuous process of identifying, assessing, analyzing and monitoring expected damages, possible risks and the overall state of conservation of built heritage structures.[11]

Effective preventive conservation requires procedures for regular assessment and documentation of material condition and system functionality at a frequency that allows quantitative or qualitative detection of small change so that treatments may be taken to slow the rate of change or deterioration and to prevent damage. Periodic assessment

should include exposed and concealed materials and systems. The frequency of assessment will vary. For example, measurement of displacement of the top of selected slate panels might occur seasonally to account for solar exposure and movement, while observation of the roof, skylights, and drains would occur weekly and after storm events. Internal corrosion of a piping system or metal HVAC duct under the floor might be assessed on a five-year frequency.

Preventive conservation of a heritage building requires a plan, professional guidance in assessments, and availability of craft skills for undertaking maintenance and treatments.[12]

10.3.4 Address causes rather than results or symptoms, by preceding treatments with investigations of causal factors.

Reinforcing the CMP's understanding of the character-defining elements (CDEs) of the building as connected "systems" rather than disconnected collections of architectural "elements," conservation measures should be premised on an understanding of the performance and design of the systems, so that observed symptoms are related to underlying causes. All treatments, therefore, should be justified by an investigation of causal factors (which subsequently can be tested).

10.3.5 Ensure that conservation treatments recognize the systemic and interdependent nature of the House's character-defining elements.

The MH&G is comprised of assemblies of materials and elements that have separate functions or must act in concert to perform a single function or result. Many of these assemblies are CDEs. Accordingly, when one material or element requires treatment or replacement, the possibility of treatment or replacement of other materials and elements in the assembly should be assessed.

Specific examples of applying this systemic approach to understanding what conservation attention should be devoted to CDEs are:

- **Roof replacement, skylight restoration, roof drainage and energy efficiency.** The roofing membrane is past its functional service life and needs replacement. The roof drainage system is located in the cavity between the roof deck and the ceiling. Replacement of the roof membrane provides a once in 25-to-30-year opportunity to open the roof deck and repair/upgrade the drainage piping—as well as inspect the steel framing for corrosion and improve thermal insulation and vapor control in the cavity. The membrane must be terminated under flashing and counter-flashing that prevents water from entering the joints between the skylights and the roof and the roof and the perimeter parapets.
- **Terrazzo, bedding mortar, structural slab, soils, and drainage.** Cracking of the terrazzo may be the result of one causal factor or multiple factors, including lateral movement from thermal expansion contraction or rust jacking or from vertical movement of the underlying support, such as bedding mortar disintegration, slab deflection, soil subsidence, or drainage piping leaks. The following issues must be addressed:
  - What is the existing condition of the foundations and soil on which the terrazzo bars, including site utilities which run under the terrace? Cracking and displacement are worst at the southwest corner of the House, where subsurface drains exit the House.
  - What are the requirements and appropriate methods for isolating and accommodating movement among the elements that make up the flooring system—underlayment, terrazzo, columns, and wall systems?
  - Is it feasible to conserve the existing material in place? Or does the nature of problems make replacement the only viable alternative?
  - How will construction activities associated with replacement impact other CDEs of the site—landscape materials, site utilities, wall cladding systems, steel columns, interior terrazzo?
  - Eliminate use of de-icing salts if still in use.
- **Lateral separation of the slate cladding from the mortar bed and supporting concrete unit masonry wall**. At the top of

most of the slabs, the joint between the slab and the backup masonry is open between 3/8" and greater than 1 inch. As noted as early as 1956 , this may result from the natural warping of the stone slabs, but it raises a concern that the stone may have continued to move away from the wall for other reasons. Therefore, it is appropriate to confirm the original method for supporting the large slate slabs, as well as its capacity and condition and to consider the following questions as part of a study and monitoring:

- Is this the result of mortar shrinkage and lack of an appropriate backer rod or fill material to support the mortar across a wide gap?
- Is this the result of thermal warpage cycles of the slab from sunlight, and have they been sufficient to debond the mortar fill at the top edge?
- If warpage (thermal or stress relaxation) has continued, post installation, is the resultant force sufficient to overstress the shear bond of the upper anchor at either the slate end or the CMU end, leaving the slab with minimal lateral support?
- Is there possibility of slight rotation of the slab at the base due to weakness in the setting bed or bearing surface (we know the terrazzo setting bed has weakened at the edges)? If so, is the resultant force from rotation sufficient to overstress the shear bond of the upper anchor at either the slate end or the CMU end, leaving the slab with minimal lateral support?
- Use infrared thermal imaging or surface penetrating radar to locate the anchors and possibly detect bonding continuity.
- How can debris be removed so that cumulative wedging action does not occur?
- What is an appropriate method of closure of the existing gaps that will accommodate continued or cyclical lateral movement at the top of the slab?

While the study is underway, install a temporary filler (backer rod or ethafoam) at the top of the slab(s) and monitor the temperature, solar radiation, cyclical and cumulative lateral movement at the slab top.

- **Coatings failure and corrosion of exposed steel at low points or intersection with other assemblies.** (see Roofing discussion)
- **Replacement of integrated glazing units and ultraviolet filtering films in aluminum frames of windows and doors.**
  - Evaluate the condition of perimeter seals.
  - Plan for the eventual replacement of glazing systems. Maintain existing frames and sightlines, while attempting to improve thermal performance through thermal breaks, etc. Much research being done on conservation/repair/replacement of post-war glazing systems internationally.
  - Check annually the ultraviolet-filtering performance of the film applied to the glass in 2010. Plan to replace film as soon as its effectiveness wanes as part of a preventive conservation program and/or as part of glazing system replacement.
- **Finish repair and replacement (finishes analysis)**.
  - Standards for repainting should be different from those in place when the Millers occupied it, which recognizes that the institution is now conservators, not homeowners and author/designers.
  - Carry out an analysis of original finishes and colors. A policy of "matching existing colors" can eventually lead far away from the original appearance, as formulations change and materials alter through age.
  - Some materials may no longer be available for replacement.
  - Signs of use are part of patina. Don't repair chips, scratches, etc. that aren't structural or highly visible.
  - Housekeeping methods, personnel and equipment should be carefully reviewed to prevent damage to finishes.

10.3.6 Engage experienced conservation professionals.

Augment existing conservation and maintenance and management expertise on staff and among legacy contractors. Multiple factors inform

this recommendation: first, acknowledging the NHL status and surpassing significance of the MH&G as a complex work of design; second, given the advanced life-cycle stages of many of the building systems and assemblies, the bespoke nature of the design, the contributions of careful material choices to overall architectural effect, etc., the best national professional should be engaged to diagnose and design interventions for the House. This relates especially to the roof/skylight assemblies, terrazzo on the plinth, and slate panels.

10.3.7 Reduce the risk of fire at the Miller House.

Early detection and response to a fire during the incipient phase of fire development before the fire is self-sustaining can greatly limit the amount of damage from fire, smoke, and water. As noted in Section 9.7, there are only five smoke detectors in the House. The present smoke detection system is not likely to provide the earliest detection of a fire because accumulation of smoke sufficient to initiate the alarm will be delayed by smoke migration and dilution in the skylight recesses and cavities.

A very-early aspirating smoke detection system (VESDA), consisting of small air sampling ports and concealed tubes throughout the house and a central high resolution, small particulate smoke detector is needed for the Miller House.[14] Concealed aspirating smoke detection systems have been successfully installed in numerous NHL houses, including Monticello and Mount Vernon, and a system is being designed for the Charles and Ray Eames House. The skylight cavities at the House would make concealed installation of the system comparatively straightforward although some spaces without skylights may require access through a ceiling cavity for branch lines.

The basement should have a natural gas detector. Consideration should be given to eliminating the gas-fired domestic water heater and replacing it with small on-demand electric water heaters for the lavatory in the active bathroom and possibly the kitchen sink.

The basement mechanical room should be protected by an automatic fire protection sprinkler system; the design of the system should avoid water risks to the adjacent collections storeroom.

As with other work at the MH&G, design of the above improvements should be performed by specialist professionals with extensive experience with NHLs.

10.4 POLICIES RELATED TO THE LANDSCAPE

Landscape balances both static and living systems. While horticulture relates to the living systems (soils, arboriculture, etc), landscape also includes static systems, like paving and other structures. Change is inevitable and anticipated in horticulture. And horticulture is subject to change instigated by fashion (varietal changes) as well as science (global warming issues, etc).

While change over time is to be expected with any garden—shaped by the life-cycles of plants, weather events, climate change, and natural processes, as much as the artifice of gardening—the significance and function of the landscape can still be sustained. As long as "tolerances for change" in specific elements and spaces are respected, the landscape can become healthier while maintaining the cultural significance of the whole site. In general, landscape and garden elements possess greater tolerances for change than architectural elements regarding their materiality, as long as the spatial structures and functions of the landscape, and the character of garden elements, are retained.

There is no single approach to plantings replacement—sometimes in-kind replacement is the most suitable way to balance the factors noted above; sometimes replacement with different species achieves the best balance. Examples of both characterize the MH&G's maintenance history.

Selective change of plantings in keeping with Kiley's original design logic and the Millers' desires for the landscape has long been part of the maintenance and conservation of MH&G. For instance, replacement of the horse chestnuts with buckeyes along the Entry Allée in 2013; the arborvitae hedges interwoven with the Entry Allée trees were changed earlier to yews (taxus), as the Millers worked with Kiley to make adjustments to the original design. Such changes are examples of the resilience and adaptability of MH&G's landscape design,

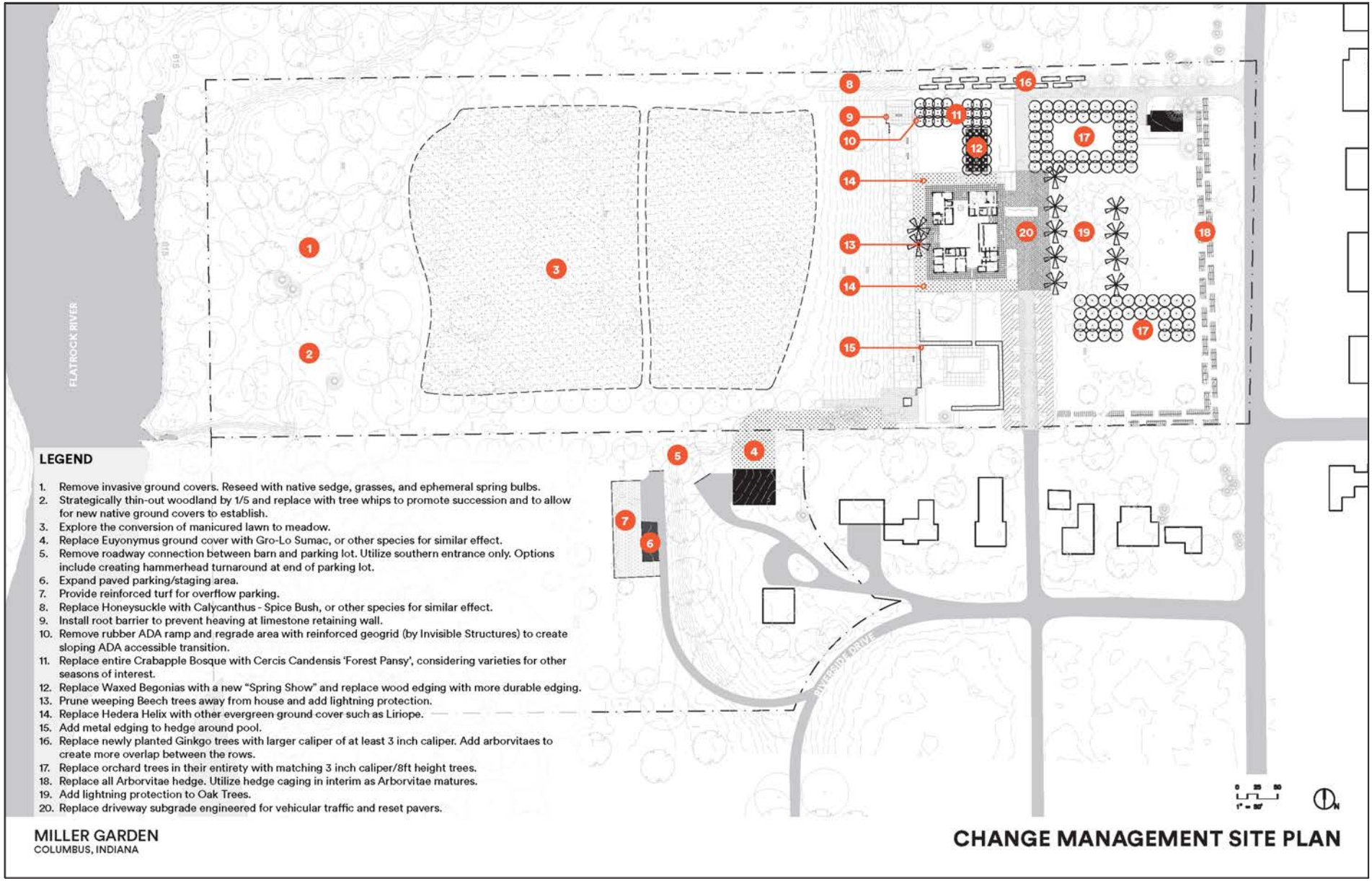

Fig. 10.4.1 Change Management Site Plan. Date: 2021. Photo credit: PennPraxis/DAVID RUBIN Land Collective

laudable efforts to maintain both aesthetic qualities and ecological fitness, and should not be interpreted simply as departures from the original planting plans.

The following landscape-related policies suggest varied types of change and adaptation, and generally continue the established practices of the Millers and Newfields in continually, gently conserving and strengthening the landscapes. Some of the adaptations and recommendations noted below are underway, stemming from Newfields' ongoing gardening/maintenance practices and continuing conservation of the landscape. Please refer to Figure 10.4.1 for a graphic summary of landscape recommendations.

10.4.1 Continue replacement of plantings

Plantings replacement need not be in-kind, though must be guided by spatial considerations/integrity of original design logic and by sustainable management practices. Sustainability in terms of landscape and garden conservation should balance three considerations: maintaining the cultural significance of the original design concepts; increasing biodiversity and ecological resilience of the plantings and the entire property; and allowing for operational efficiencies and programming innovation while reducing financial impacts of maintenance.

Generally, plantings should be replaced at the scale of whole spatial features or large portions (a grid, bosque, allée, bed), not piecemeal/individual plants.

- **Orchards wholesale replacement**: in keeping with the principles of the CMP, Newfields recently completed replacement of the two orchard plantings in the east lawn, maintaining the original grid configurations from Kiley's plan, using specimens of uniform caliper.15
- **Oaks**: the double allée of white oaks in the center of the east lawn present quite a challenge. These very large, mature trees are critical to the character of the east lawn. One oak has been removed (the northeastern-most, in 2020). It is not suggested to replace the single missing oak—despite its absence, the allée still reads as an allée. If other oaks are damaged or fail, the difficult choice will be single replacement or all-at-once replacement. Replacing one tree of similar size is not possible; adding a much smaller specimen will change the visual composition beyond tolerances. Consider future replacement of the entire allée at once; this may be the best option. If another large specimen is removed and is not immediately adjacent to the one that fell previously (on the end of the row), consider replanting all ten of them at once. If the one immediately adjacent to the one that is gone also went missing, it may still read as a compositional whole. But if tree loss begins looking like "missing teeth," then wholesale replacement may be warranted. In this case, the largest-caliper-possible specimen trees should be used. Meanwhile, continue to monitor the health of these oaks, as stated below, install lightning protection.
- **Arborvitae**: these extensive border hedges in distinctive staggered form, are reaching the end of their lives; some have already begun dying off, and most are supported by internal wire supports. Kiley suggested in 1981 to insert yews within the hedges to repair missing elements and maintain the shape of hedge blocks.16 This is not suggested. It is ideal to replace large runs at once, an entire interior or exterior boundary at a time, in order to maintain the hedges' function as privacy screens. The replacement of arborvitae around the pool have tested the limits of this replacement principle—the conical replacement plants were planted in long runs but will take years to acquire the same visual function as the tall rectangular hedge they replaced which provided thorough screening. This should not be a precedent for the replacement of arborvitae boundary hedges—where the screening function and double-row pattern is even more significant and has a lower "tolerance for change."
- **Adult Garden's crabapple groves**: these were originally redbuds and should be replanted with redbuds, both groves all at once. This rare instance of restoration (changing a plant back to its original) is warranted here—due to the availability of appropriate redbud cultivars and the clear preference for redbuds in Kiley's design. (The unavailability of redbud replacements led to the 1986 planting of crabapples at Jack Curtis' direction, which have themselves matured and will need replacement soon.) In the grid of varied ground cover under the eastern crabapple/redbud bosque in the adult garden, two conservation decisions are viable: preserve and repair the existing grid of ground-covering

plants and pavers resulting from the 1986 Curtis renovation, or restoring the original Kiley arrangement of the this bosque underlain by a few low ilex hedges arranged on selected edges of the redbud bosques. Further research would be needed to determined the original plantings and exact arrangements. Either decision would be acceptable under the policies recommended in the CMP.

10.4.2 Implement preventive conservation of key plants

Lightning protection of larger trees in House-adjacent landscape zones should be installed as soon as possible. These include each tree in the allée of oaks in the east lawn (the nine trees remaining of the original ten) and the weeping beeches overarching the House's roof on the east and west sides of the House. Other trees may be identified by a consulting arborist.

This does not apply to the forested riverside area.

10.4.3 Repair hardscape features

- **Service area pavement**: there is a considerable number of broken or sunken pavers in the service area, due to overuse by tour buses and subsidence/water pooling near the edges. Individual broken pavers should be replaced using the stock of originals that are being kept in storage. Replacements initially look different from weathered pavers (their finish coating wears away over time to reveal the textures aggregate). New pavers could be artificially weathered by scouring them, but this is not recommended, as a longer service life for the pavers outweighs the value of a totally uniform appearance. For damaged edge areas, repair will require removal of pavers, regrading, and re-placing old pavers (perhaps with some replacements). To address the underlying causes of the damage, other route options for tour buses should be explored (e.g., pulling straight in/out of the driveway to eliminate the damaging turns, dropping some tours down at the barn, requiring visitors to walk past the allée of maples and concrete stair at the south boundary of the site).
- **Concrete stair connecting south plaza of the honey locust allée to the maple allée along the south boundary**: remove the eastern-most maple of the allée that starts at the bottom of the stairs. Its roots are damaging the stair structure and creating a tripping hazard. Removing this maple at the end of the allée will not impact the spatial structure of landscape.
- **North plinth of honey locust allée**: jacking of stones due to root growth of nearby honey locusts has damaged the plinth/plaza. Open joints will continue to accelerate cracking of stone units. Stones comprising the plinth should be removed; install subsurface root guard to prevent honey locust roots from displacing the stones again; reset stones to square (original detail drawings have not been located). On the east edge of the plinth, replace the plastic ramp under the gravel.
- **Replace edging around pool arborvitae separating gravel from lawn.**

10.4.4 Adapt/rehabilitate landscape elements with higher tolerance for change where benefits to sustainable management can be gained without compromising integrity/significance.

- **Explore adaptation of the Meadow from its current condition and function as a monoculture lawn to a true meadow**: The large open space between the house plinth and the forested riverbank area has long been planted and managed as a monoculture lawn—despite being called the Meadow. The new meadow design could sustain the visual qualities of the wide-open, mostly flat expanse of land between the House plinth's western slope and the forest edge. Kiley's original planting plan and other documentation is ambiguous about the design intention and the Meadow terminology; the adaptation proposed here abides by Kiley's spatial logic if not his precise intent. The ecological and managerial benefits of the conversation potentially outweigh the departure from Kiley's intent. In other words, the potential benefits suggest a greater tolerance for change for this feature.

  While fulfilling a key function in the original landscape design—comprising a larger-scale landscape area, providing a distant view of the woods, admitting light from the west—the cost and carbon footprint of frequent mowing and foregone biodiversity benefits warrant rethinking the composition of this planting. A true meadow will increase biodiversity and ecological sustainability;

reduce maintenance costs substantially; and provide a helpful model for other historic sites to emulate. A Midwest-specific meadow mix should be researched, aiming for mostly grasses and few flowers, tapered from house toward river to balance plant diversity, aesthetic uniformity, ecological benefit, and maintenance efficiency. Mowing and watering would be much less frequent; pollinators would thrive; visitors can learn about Newfields creative and sustainable management philosophy (a further example of integrating the value of art and nature). Though the Meadow would continue to flood occasionally, this would not present overwhelming conservation or management problems.

Some similar applications of meadow planting are shown in Figure 10.4.2. These are suggestive precedents, not meant as literal models. Further study would be required to propose a plan of the adaptation. The meadow could be piloted in the barn-adjacent lawn south of the original site.

- **Strengthen the Riverbank**: The forested riverbank area requires more intensive maintenance to increase its ecological health and resilience and support greater biodiversity of the entire landscape. Suggested measures include forest thinning; reducing herbaceous invasives from the understory and from the frequently flooded riverbank zones, promoting sedges to withstand river inundation. Manage current woodland edge of the Meadow (retaining as long as possible the single arborvitae and willows that serve as notable visual reference points as viewed from the House). In the long-term, manage forest succession to enable a little more light internal to the woodland.
- **Reuse the sculpture platforms at both ends of the honey locust allée: reuse sculpture plinth and wall at north and south ends (respectively) of the honey locust allée** as display platforms for rotating exhibition of Newfields collections and/or new works of art. This would sustain or restore an historic function of these spaces and therefore advance the conservation of site's cultural significance. These spaces were adapted by the Millers in the 1970s, after completion of the original design, and are currently empty (the works having been sold in connection with the ownership transfer from the Millers to IMA). In terms of site management, reuse of these platforms would give visitors a reason to return; builds stronger linkages to Newfields' Indianapolis-based collections and curators; and create opportunity to engage with the local art community.
- **Strengthen northern boundary plantings to serve more effectively as a screen to the neighboring property**: this should include: introduction of larger, healthier ginkgoes to replace/augment the small existing specimens; new arborvitae hedge blocks; replacing the mass of honeysuckle at the western end of the northern boundary with sweetshrub (*calycanthus*), Heptacodium, or other option that would provide similar foliar features and be more environmentally sound.
- **Utilize the Barn property**: there is substantial "tolerance for change" in the 4-acre parcel the Millers added later, which includes the barn, small parking area, utility spaces, substantial lawn, and riverbank forest. This area is well-screened from the House and most Garden spaces. It could provide additional space to accommodate parking, tents, deliveries and other impacts of occasional events; it could also be used to pilot the introduction of meadow and forested area treatments mentioned above. In any event, the entire 14-acre parcel should be managed holistically, in terms of ecological values and its uses for back-of-house management functions.

10.5 POLICIES RELATED TO THE COLLECTIONS

Develop a collections care policy that is appropriate for the MH&G. While there may be practical limits for the interior relative humidity level that can be safely maintained in the Miller House during winter without damage to the historic building fabric, much can be done to mitigate risks to collections without compromising the building. (See 10.3.2, 10.3.3 and 10.3.7) However, this cannot be determined until existing conditions, such as temperature and moisture data for the cavities of the roof/ceiling assembly and the design intent and effect of the turbine vents, have been collected and assessed (see 6.14).

As noted in section 10.2.1, rotating collections objects on display is one appropriate option for finding the balance necessary for long-term conservation of the character-defining features or objects. Additionally, surveying the condition of the elements of the interior and the collec-

Meadow Intent for The Miller Garden

The team's recommendation is to convert the large expanse of manicured lawn, with a carefully selected mix of mostly warm season grasses and native legumes. Visually, the goal will strive for a mostly verdant planting with the occasional floriferous moments for seasonal interest. Mown paths can define a clean perimeter and pedestrian circulation path(s) as appropriate.

A meadow will preserve beautiful vistas between the Miller House and the forested riparian corridor. The grounds will benefit from reduced operations and maintenance, less fuel and labor compared to mowing, and mowing can be reduced to once a year. Meadows require low water usage to maintain, provide increased biodiversity, and provide an additional layer of resiliency from intermittent flooding.

Potential Nursery Sources

Plants should be regionally sourced from native seed and plant growers that specialize in Midwest native grass meadows. Two trusted sources include:

Applied Ecology Native Nursery
Brodhead, WI
https://www.appliedeco.com/native-seed-plants/

Ernst Seed
Meadville, PA
https://www.ernstseed.com/

Storm King Art Center
New Windsor, NY

Storm King Art Center was founded in 1960 and overtime has developed to include over 500 acres of property. The site is predominantly pastoral landscape with long vistas and dramatic views of the Schunnemunk Mountain range, part of New York State's Hudson River Valley. The site's hallmark are the 100 acres open fields of native grass meadows, bound my mown turf pedestrian circulation routes. The meadow's were installed around 1995, and comprised of warm season grasses: Switchgrass, Big Bluestem, Little Bluestem, Indiangrass, Purpletop Tridens, Canadian Wildrye, and Sideoats Grama Grass and Patridge Pea which served as an early successional species that phases out over time.

Text Sources: Stone King Art Center website, 2022, *About Landscape* Page; and Dorian Winslow, Horticulture Magazine, 2012, *Growing Meadow Grasses at Storm King Art Center*.

Parrish Art Museum
Water Mill, NY

Parrish Art Museum, located in Water Mill, NY, showcases contemporary art through a combination of interior gallery spaces and 14 acres of grounds that serve as an extension of the interior galleries. The landscape is dominated by three meadows, connected my paths, for large scale art installations: Entry Meadow to the north connects to the building's main entrance, Terrace Meadow to the west, and the Great Meadow to the south which hosts the majority of the sculptures. The meadows, installed around 2012, are mostly warm season grasses and wildflowers with some cool season planting for visual interest throughout different seasons. The meadow has taken time to establish due to soil compaction and soil composition, but the museum is taking the long view for its success.

Text Sources: Parrish Art Museum website, 2022, *About: Landscape*; and Alejandro Saralegui, Cottages & Gardens Magazine, 2016, *6 Questions for Doug Reed on the Parrish Art Museum's Landscape Design*.

MILLER GARDEN
COLUMBUS, INDIANA

MEADOW CONVERSION PRECEDENTS

Fig. 10.4.2 Meadow Conversion Precedents. Date: 2021. Photo credit: DAVID RUBIN Land Collective

10.6 POLICIES RELATED TO MANAGEMENT

10.6.1 Prepare a site-specific, stand-alone Emergency Preparedness and Response Plan for the Miller House and Garden.

Emergency preparedness and response are essential responsibilities and functions of cultural heritage stewardship. The *2015 IMA Disaster Stabilization and Recovery Plan* addresses the Miller House and Garden as part of its comprehensive overall plan for the Newfields campus. Instructions for the Miller House include appendices for staff contact procedure, floor plan, contractors contact list, and an emergency supplies list.[17]

The MH&G has site-specific risks that differ from those at the Newfields campus and is served by a different set of local emergency response agencies. Therefore, the Miller House warrants a stand-alone *Emergency Preparedness and Response Plan* that can be executed without need to refer to the Plan for the Newfield's campus. The Plan for the MH&G should include the essential elements of risk assessment, risk mitigation, and emergency response planning.

Risk Assessment is a method for prioritizing resources for preserving the building, landscape, and collection, based on vulnerabilities and value. *Mitigation* involves taking pro-active steps to limit the vulnerabilities identified in the risk assessment and includes measures performed prior to an emergency event. These measures include staff training and establishing working relationships with first responder agencies, contractors, and suppliers.

Emergency Response Planning establishes the organization and responsibilities that comprise an emergency response and sets out the overall strategy for minimizing the impact of an emergency. The response plan includes a contact list (including back-up personnel); identification of the prioritized elements of the building, landscape, and collections; materials lists; triage/transfer/storage areas; contractor/vendor list; procedures and training plans; and practice frequency.

The American Institute for Conservation and the Foundation for Advancement in Conservation (AIC and FAIC) developed recommendations for an emergency preparedness and response plan for collections; this can be the starting point for creating a site-specific plan for the MH&G and the collections.[18]

Emergency preparedness and response for cultural heritage sites should include training of staff and emergency response personnel. As part of its role as co-sponsor of the Heritage Emergency National Task Force, the Smithsonian Institution's Heritage Emergency and Response Training (HEART) program serves U.S.-based cultural and emergency professionals who want to improve their skills in responding to domestic disasters. Newfields could take a leadership position in bringing the HEART program to Columbus for Newfields staff, MH&G staff, other Columbus sites and Columbus/Bartholomew County emergency responders.[19]

Emergency preparedness and response planning also requires engagement with State, County or Local emergency response agencies so that they address the needs of the MH&G in their own emergency preparedness and response planning. FEMA publication 386-6 *Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning* specifically addresses the need and methodology to address historic buildings in a State, County or Local Hazard Mitigation Plan.[20]

10.6.2 Develop policies for documentation of existing conditions and conservation management/projects.

There is a great deal of documentation of MH&G, broadly speaking: Newfields' extensive archives; additional archival collections related to the designers and to the Millers; reporting in the general and professional press; and scholarship. However, some key additional needs specific to conservation and managing MH&G require additional action.

- **Prepare a comprehensive and up-to-date site survey**. There is no accurate, comprehensive site survey for the historic or adjunct properties (2860 and 2800 Riverside Drive, respectively) showing topography and locations of structures, paths, and key vegetation, such as tree size and species. This data is essential to documenting future maintenance and change for landscape

elements, assessing risks to buildings, systems and collections due to flooding, and implementing future initiatives. The CMP includes a general survey of existing conditions of the landscape, but this was based on field investigation and remote sensing data, not on a comprehensive or georeferenced survey.

- **Develop as-built drawings and photographs for existing buildings**. The Newfields Archives contain the complete construction drawings for the House, but limited information on the Greenhouse and structures at 2800 Riverside. Digital floor plans and elevations of the House were created from the construction documents to serve as base drawings for conditions documentation during the CMP, but field-verification was beyond the scope of the CMP. Given the significance of the property, comprehensive photographic documentation of the site is recommended, as well as accurate digital plans, elevations, etc. This will assist with ongoing maintenance and planning, as well as repairs in the case of severe damage by fire, flood, windstorm, etc. It could be carried out by architecture or preservation students (noting Newfields developing partnership with Ball State University's Historic Preservation Department for this purpose).
- **Carry out periodic survey of landscape plantings**. Regularize and archive seasonal surveys of existing conditions, including Garden spaces and the conditions of formal plantings as well as forested spaces and other areas susceptible to invasive plants, erosion or other ecological degradation.
- **Document concealed systems**. The location of concealed systems such as the roof drainage piping, the floor heating piping and electrical power circuits are shown on the construction drawings, but their as-constructed locations should be confirmed and documented. There are a variety of non-invasive techniques such as infrared thermography, fiberoptic borescopic inspection, magnetic detection and surface penetrating radar that can be used for location discovery, the selection of which will depend on the materials concealing the system and the system materials.
- **Research history and significance of Barn and Managers House**. The Barn, Manager's House, and associated site were excluded from the CMP. Their history, evolution, and existing conditions should be researched and surveyed, so that appropriate preservation guidelines and budgets can be developed. Digital plans, sections, and key elevations will also assist with future monitoring, planning, and maintenance.
- **Capture & archive documentation on existing conditions and past and future treatments.** Stewardship and conservation of a resource are informed by records of past work and events. The extensive records pertaining to design, construction, and maintenance of the site during ownership by the Millers, now accessible in the Newfields Archives, have been invaluable in the research necessary for this Conservation Management Plan.

  Currently, the Director of Historic Properties maintains files concerning work on the buildings and landscape, but these records are not catalogued and archived at Newfields.

  Work undertaken on the buildings or landscape should be documented with information at a level of detail appropriate to the scale of the work or intervention, including the date, nature, scope, contract, and cost and the firm responsible. The repairs should be documented, with "before" and "after" photos. The documentation should be digitized, catalogued, and archived by Newfields on a regular schedule—and integrated into the Newfields Archives. Retention of these records on site puts them at the same risk as the buildings they are in. Archived records must be accessible by MH&G staff so that the records of past work will inform the development of appropriate preventive conservation measures.

10.6.3 Reinforce Site Management and Construction Management Best Practices

Staffing, training, hiring consultants and contractors, and organizing on-site work are standard functions of site managers. This policy reinforces Newfields' existing policies and practices, particularly as concerns the provision of staff resources adequate to the tasks of conservation management and stringent safeguarding of significant features, spaces and character-defining elements during periods of on-site construction and maintenance work. More specifically, it is recommended to establish policies to:

- Assess the tasks and actions needed for effective stewardship of the MH&G, then investigate and establish the number and quali-

fications of on-site staff needed for efficient use of human resources in the execution of those tasks and actions. Evaluate the off-site support needed by on-site staff from Indianapolis based staff. Consider potential volunteer contributions carefully, as the level of training needed for on-site work should not be underestimated.

- Based on the above develop a budget for adequate on-site staffing (and possible contracting) and for necessary off-site support.
- Update and complete job descriptions for site staff and off-site supporting staff, including new positions.
- Develop more detailed checklists of daily, weekly, and seasonal tasks associated with housekeeping, collections care, site maintenance, and seasonal activities.
- Recruit additional staff consistent with stewardship needs and responsibilities.
- Identify opportunities for staff training and development in preventive conservation (site, building, and collections).
- Develop "back-up" personnel for critical staff positions
- Develop policies and procedures to qualify and select professional consultants and contractors for identified and budgeted projects. Note that professional consultants for this demanding and highly significant site should be drawn from the national market of preservation-experienced consultants (architects, conservators, engineers, designers, other consultants).
- Safeguard building, landscape and collections during maintenance, repairs, and larger interventions. The impacts of work on all site features, including the landscape, must be minimized.

10.6.4 Commission a Heritage Reinvestment Plan and Reserve Fund to ensure that endowments include appropriate levels of funding for ongoing operations and stewardship, culminating in development of a Reserve Fund.

As Newfields explained in its application to the Keeping It Modern program:

> The Miller House and Garden is supported through an endowed fund established by the Irwin-Sweeney-Miller Foundation. With an annual draw of $225,000, this fund is used to support all operations and capital needs of the property, including three full-time employees. Newfields must secure additional philanthropic support for projects beyond short-term maintenance based on the most immediate needs. A large portion of the annual endowment draw is consumed by landscape preservation and upkeep.[21]

At present, the endowment draw is insufficient to address both annual operating expenses and long-term capital needs of the MH&G. Newfields must increase the endowment to cover anticipated costs for capital improvements that are consistent with a philosophy of preventive conservation and maximizing functional service life. This will help Newfields avoid an uneven cycle of small ad-hoc repairs punctuated by episodes of fund-raising, major rehabilitation, and repair, and sometimes heroic interventions. Such a management approach is inherently more risky, as noted in Section 10.2. For historic buildings, heroic interventions do not result in maximum retention of historic materials or workmanship when compared to a sustained program of adequately funded preventive conservation.

The plan recommends carrying out a Heritage Reinvestment Plan and a Reserve Study to determine the appropriate size of the endowment. Public Works Agencies and Home Owners Associations have approached this planning using two methods:

- For government entities with fixed assets and infrastructure, the Government Accounting Standards Board (GASB) publication GASB-34 provides the accounting methods that emphasize long-term budgeting for capital projects. This planning and accounting method follows the *Asset Lifecycle Model for Total Cost of Ownership Management (Asset Lifecycle Model)* or a *Reserve Study*.[23]
- For Home Owners Associations (HOA), Condominium Boards and similar common interest property developments that have a fiduciary duty to budget and maintain cash reserves for replacement of capital improvements, the *Reserve Study Model* can be used. The *National Reserve Study Standards* issued by the Community Associations Institute address this fiduciary duty, and in some states, a *Reserve Study* may be a requirement of state law, such as California's 1985 Davis-Stirling Act.[24]

For stewards of cultural heritage, the methodologies of the *Reserve Study* and the *Asset Lifecycle Model* can be adapted to the special considerations of built heritage and stewardship for a budgeting method to maintain an historic building in a state of preservation. One adaptation is the *Heritage Building Reinvestment Plan* and the *Reserve Analysis*.

A *Heritage Building Reinvestment Plan* is prepared by a historic preservation professional and a contractor or construction manager with experience in historic buildings. Preparation of the Plan includes assessment of existing conditions, estimates of remaining service life, and estimates of replacement costs, similar to the *Asset Lifecycle Model* but with notable exceptions:

- The objective is to establish sufficient reserve funds to maximize the service life of the historic building materials, assemblies, and systems, rather than replace them.
- Within a given category of preservation work, all components, assemblies, and systems should be included, regardless of service life duration, even though many *Asset Lifecycle Models* will exclude components and assemblies with service lives greater than 100 years.
- If it is necessary to replace materials or assemblies, "replacement in kind" is necessary, not substitutions. This must be reflected in the material and labor costs.
- Service life data or cost data for labor and archaic assemblies and material is limited, therefore, these must be estimated based on experience.
- Depending on the complexity of work for an historic building, the costs for design, project management and administration may be higher than 20% of the total construction costs cited under the GASB heading *Current Replacement Value*.

A *Heritage Building Reinvestment Plan* typically **excludes**:

- Investigations and diagnosis of existing deterioration problems;
- Housekeeping and similar operations;
- Upgrades or improvements to the building needed to accommodate new or changed uses, occupancies, or tenants;
- New construction or expansion;
- Work needed to conform with new or changing building codes or regulations; and,
- Site features that are part of a larger cultural landscape.

A Heritage Building Reinvestment Plan for the Miller House would address the special considerations encountered in planning for future capital expenditures for the building including:

- The possible *categories* of conservation/preservation work such as roof, structure, windows, and doors;
- Identifying and organizing the building *components, assemblies, and systems* for each category of work;
- Establishing the *service life* and *remaining service life* of the building components, recognizing that maintaining historic fabric in good condition is the desired outcome; and,
- How to approach estimating costs given the special considerations of undertaking projects and professional services for preventive conservation, preservation, and restoration of *components*.

The degree of confidence in the projections of a specific *Heritage Reinvestment Plan for the Miller House* will depend on the quality and level of detail of the information available on the building. To this end, essential information for preparing a *Heritage Reinvestment Plan* includes:

- History of original construction and subsequent alterations, designers, builders, and material sources;
- History of uses, especially changes in use, and significant events that may have caused damage;
- Drawings of sufficient detail to develop estimates of quantities of work;
- Identification of potential hazardous or toxic materials, such as asbestos and lead, which may be encountered in the existing construction so that the remedial costs for these are included;
- Assessment of existing conditions in sufficient detail to understand causal factors that affect past and future durability;
- Understanding of past climates and projected climate changes that affect material durability;

- Understanding of conservation measures needed to remedy damage and preventive conservation measures that will extend future durability; and,
- Knowledge of labor and material costs for work on historic buildings.

The *Reserve Analysis* determines the amount of money to be placed in the *Reserve Fund* based on the needs identified by the *Heritage Building Reinvestment Plan* and the financial capacity of the building steward to fund the work. The *Reserve Analysis* is done by the building steward, the institution's accountant, and the support of the Board. The professional responsible for preparing the *Heritage Building Reinvestment Plan* should be available to answer questions about the results of the *Plan*.

The *Reserve Analysis* includes a financial analysis of the institution's capacity to support regular contributions of the Reserve Fund for Heritage Reinvestment. The Reserve Analysis establishes the contributions to the Reserve Fund for Heritage Reinvestment which will be needed over a fixed period, typically ranging from 40 to 50 years. There are two common methods for determination of the annual contribution: the Cash Flow Basis and the Component Basis. Typically, the Cash Flow Basis is used.

10.6.5 Revise Newfields' Historic Preservation Policy.

Newfields' current Historic Preservation Policy, completed in 2017, includes (in Section II) the intention to revise the guidance every five years. As Newfields undertakes this revision this year, several points of revision are recommended to bring the HPP into alignment with the guidance of this CMP (note that section identifiers used in this subsection refer directly to the 2017 HPP document):

III. STATEMENT OF SIGNIFICANCE

Regarding the subsection on MH&G: The statement of significance, lists of CDEs, and assessments of integrity from this CMP should replace what was used in the 2017 HPP. These updated policies capture the greater level of research detail, analysis, and assessment possible in this extended timeframe of the CMP study.

IV. GUIDELINES AND STRATEGIES (DECISION-MAKING CRITERIA)

The HPP then assigns one "level of intervention" for an entire property as the overall preservation policy—for the MH&G it is "preservation." This low-resolution approach to policy lacks the fine distinctions necessary for a site of such high-quality design, history of extremely careful maintenance, and surpassing level of cultural significance. While the CMP endorses reference to the Secretary's Guidelines as a widely shared lexicon for discussed conservation interventions, the CMP adopts a much higher resolution of analysis and decision-making. The CMP also employs a somewhat different philosophical approach to overall preservation policy, basing decisions on individual elements' tolerance-for-change rather than prescribing material treatments. (See Section 10.2.1 for elaboration.)

V. MAINTENANCE, CARE, AND DOCUMENTATION

The CMP's strong recommendation is strengthening this statement in two direct ways, embedded deeply and detailed explicitly in Section 10 recommendations: add "Preventive Conservation" to the title of this section and commit explicitly to preventive conservation as an overriding preservation policy; commit to meeting capital needs and securing necessary resources (as opposed to "using available").

10.7 ENDNOTES

[1] "Newfields Together," Newfields, https://discovernewfields.org/together.
[2] "Newfields Together," Newfields, https://discovernewfields.org/together.
[3] Newfields, Historic Preservation Policy, September 18, 2017, 5, Newfields.
[4] Shelley Selim, email communication to Pamela Hawkes, April 27, 2022.
[5] ICOM-CC, quoted in "Preventive Conservation," *ICCROM,* https://www.iccrom.org/section/preventive-conservation.
[6] A. Vandesande & E. Verstrynge, "Introduction: Preventive conservation - from climate and damage monitoring to a systemic approach," in *Preventive Conservation - From Climate and Damage Monitoring to a Systemic and Integrated Approach*, Leuven, Belgium, April 3-5, 2019, eds. Aziliz Vandesande, Els Verstrynge, and Koen van Balen (London: CRC Press, 2020), 3.
[7] Ibid.
[8] https://cool.culturalheritage.org/bytopic/ethics/neworlea.html
[9] https://cool.culturalheritage.org/bytopic/ethics/neworlea.html
[10] American Society of Heating, Refrigerating and Air-Conditioning Engineers. 2019. 2019 ASHRAE handbook: HVAC applications. Atlanta, GA: American Society of Heating, Refrigeration and Air-Conditioning Engineers. https://app.knovel.com/kn/resources/kpASHRAEVC/toc
[11] Vandesande, A., Verstrynge, E., & van Balen, K. (Eds.). (2020). *Preventive Conservation - From Climate and Damage Monitoring to a Systemic and Integrated Approach* (1st ed.). CRC Press. https://doi.org/10.1201/9781003004042
[12] Meiping Wu, Birgit van Laar, "The Monumentenwacht model for preventive conservation of built heritage: A case study of Monumentenwacht Vlaanderen in Belgium, Frontiers of Architectural Research" Volume 10, Issue 1, 2021, Pages 92-107, ISSN 2095-2635, https://doi.org/10.1016/j.foar.2020.07.007. (https://www.sciencedirect.com/science/article/pii/S209526352030056X)
[13] L.D. Hoffman to J. Irwin Miller, memorandum, August 24, 1956, box 1, folder 3, Miller House and Garden Collection (M003), Newfields Archives,
[14] https://iasetraining.org/how-vesda-system-works/; https://xtralis.com/product_subcategory/2/VESDA-Aspirating-Smoke-Detection
[15] Meeting with Newfields staff, May 24, 2022.
[16] Kiley to Hungerford, Newfields Archives, 8/14/1981, MHG_lb_B022_F238_039-040, Box 22 Folder 238.
[17] IMA Disaster Stabilization and Recovery Plan, 2015, Newfields.
[18] https://www.conservation-wiki.com/wiki/Emergency_Preparedness_%26_Response
[19] https://culturalrescue.si.edu/what-we-do/resilience/heritage-emergency-and-response-training-heart/
[20] https://www.fema.gov/pdf/fima/386-6_Book.pdf
[21] Newfields, Application for Keeping It Modern Grant, 2019.
[22] https://www.gasb.org/st/summary/gstsm34.html
[23] https://en.wikipedia.org/wiki/Reserve_study
[24] https://www.caionline.org/search/pages/results.aspx?k=National%20Reserve%20Study%20Standards

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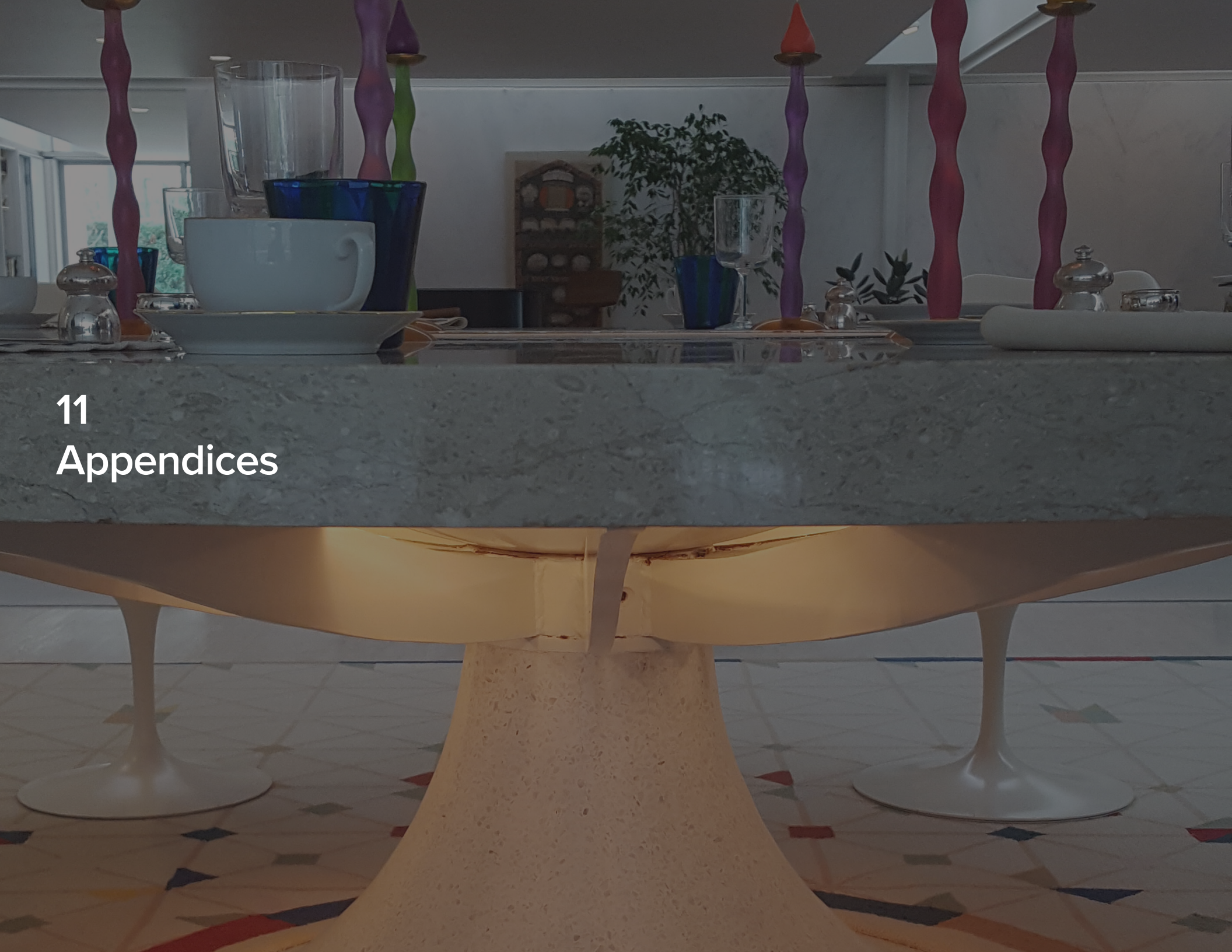

11
Appendices

Appendix A: Notes on Research and Sources

A. NOTE ON RESEARCH AND SOURCES

The goal of the Conservation Management Plan for the Miller House and Gardens was not to generate new information related to any particular aspect of its design, construction and evolution. Instead, efforts focused on analyzing existing and readily-available information in order understand its contexts and significance. The CMP team proposed to work principally from secondary sources and the Newfields Archives; in practice, additional research was carried out to develop important aspects of the context. Only materials available online were accessible due to limitations on travel and public access caused by the Coronavirus pandemic beginning in March 2020.

The most important and invaluable information related to the design and development of the site can be found in the Newfields Archives, which contain 9,442 documents related to the Miller House and Garden dating from 1953-2009 and donated by the Irwin Management Company (https://discovernewfields.org/archives/documenting-modern-living). The comprehensive and useful finding aid can be found at: https://discovernewfields.org/application/files/3715/0829/3385/archives-M003.pdf. Following review of the finding aid, Newfields made high resolution scans of key documents available to the team.

Items in the Archives are identified with the following sequence:

> [Item information], [Item type], [Month DD YYYY], [container information or digital ID], Miller House and Garden Collection (M003), Archives, Indianapolis Museum of Art at Newfields.

The archives contain multiple copies of some items, which are numbered differently. Typically, the date, title and author of materials have been cited in footnotes. Lydia Spotts, former Associate Archivist/Librarian, notes that "The filenames are permanent identifiers" and that "Archives digital surrogates were accessed from http://archive.imamuseum.org/ between 2019 and 2020."

Note that, to date, no preliminary design drawings for the house have been located. To assist the team with understanding the sequence of drawings, specifications and other materials generated for the project, a table listing the materials chronologically and according to construction industry standards was created and is included as Appendix X. Additional materials itemized in the Eero Saarinen Archives at Yale University (https://archives.yale.edu/repositories/12/resources/4418) were included. The latter were not available to view, since materials related to the Miller House have not been digitized. A future review of drawings and office files in the Yale collection might yield additional information of interest.

Additional Information related to the house after Newfields acquired the site was provided by museum staff. This included reports related to maintenance, repairs and systems, as well as chronologies of work related to terrazzo, curtains, J. Irwin Miller correspondence, etc., generated informally by Newfields staff.

Other collections reviewed digitally included:

Irwin-Sweeney-Miller Family Collection, 1790-2008, Manuscript and Visual Collections Department, William Henry Smith Memorial Library, Indiana Historical Society, Indianapolis, https://indianahistory.org/wp-content/uploads/irwin-sweeney-miller-family-collection.pdf .

J. Irwin Miller Oral History Project, 2011-2012, Manuscript Collection, Indiana Historical Society Library, Indianapolis, IN.

LIFE Photo Collection, Google Arts and Culture, https://artsandculture.google.com/partner/life-photo-collection.

Library of Congress:

- Balthazar Korab Collection https://www.loc.gov/pictures/collection/krb/.
- Carol M. Highsmith Archive https://www.loc.gov/collections/carol-m-highsmith/about-this-collection/.

Appendix B: Selected Bibliography

B. SELECTED BIBLIOGRAPHY

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Appendix C: Notes on Drawings

Project Team From Title Sheet

EERO SAARINEN & ASSOCIATES Bloomfield Hills, Mi	ARCHITECTS
ALEXANDER H GIRARD Santa Fe, NM	ARCHITECT
SAMUEL R LEWIS & ASSOCIATES Chicago, IL	MECHANICAL ENGINEERS
RICHARD KLEES JR Detroit, MI	ELECTRICAL ENGINEER

Note: Saarinen and Girard are both listed on the Architectural title blocks. Saarinen is listed only on structural drawings. The area on the title block where the Miller House would appear is blacked out on some sheets, suggesting that there was a desire for anonymity for documents that might be printed in town.

Drawings Issued:	Feb 16, 1955
Specifications Issued:	Feb 18, 1955
Addendum #1	March 3, 1955
Addendum #2	April 26, 1955
Bulletin #1:	July 8, 1955 (also referred to as Revision 1)
Bulletin #2:	
Bulletin #3:	October 14, 1955

Note: Catalogue numbers are included with Architectural Set for reference with CAD diagrams. Note that drawings were not in sequence when catalogue numbers were assigned, and a single sheet may exist in multiple forms (blackline, blueline, etc.), each of which is given a separate catalogue number.

Numbers and titles in red are included in the Saarinen Archives at Yale but not in Newfields Archives

#	TITLE	DATE	REV	NOTES
	CONSTRUCTION SET			Eero Saarinen Job 5305
#	**TITLE**	**DATE**	**REV**	**NOTES**
A1	SITE PLAN MHG_111a_FF041_002			
			Shows existing trees on site, orchard at east side of property, driveways & utilities	
A2	BASEMENT PLAN & DETAILS MHG_111a_FF041_004		Bull 1 Addn 2	Incl sections through pump room, stair. Details: steel columns, rain fountain, floor/wall details, carport pit drain, pool edge and bottom, precast conc. slab details [Details 41-43, note not all details numbered here]
A3	FIRST FLOOR PLAN MHG_111a_FF041_006	2-18-55	Bull 1 Addn 2	Note on height of conc. block wallsteel deck surfaces in contact w/mortar or block to have bituminous coating
A4	REFLECTED CEILING PLAN MHG_111a_FF041_009	2-18-55	Bull 1 Addn 2	
A5	ROOF PLAN – SKYLIGHT DETAILS MHG_111a_ FF041_010	2-18-55	Addn 2	Details 51 - 56
A6	EXTERIOR ELEVATIONS MHG_111a_FF041_013	2-18-55		N, S, E & W. Note on glass types (1/2” and 1” insulating glass) and mounting ht. for receptacles
A7	EXTERIOR WALL DETAILS MHG_111a_FF041_015	2-18-55	Addn 2	Frames for fixed and operable sash. Details 61 – 78 – windows & doors

A8	EXTERIOR DETAILS MH-G_111a_FF041_017	2-18-55	Bull 1 Addn 2	Details 79 – 111. Typ. corner plan detail showing blocking & insulation. Doors jambs heads sills, sliding gate,
A9	SLIDING GLASS DOORS – SKYLIGHT CLOSURES MHG_111a_FF041_019	2-18-55	Addn 2	Details 113 - 134
A10	INTERIOR LIVING AREA MH-G_111a_FF042_002	2-18-55	Bull 1 Addn 2	Building Sections incl foundation and roof details
A11	DINING ROOM TABLE MH-G_111a_FF042_003	2-18-55	Bull 1	Details 150 - 158
A12	FIREPLACE & SEAT DETAILS MHG_111a_FF042_005	2-18-55	B 1	
A 2	Details 160 - 170			
A13	STORAGE WALL – LIVING AREA MHG_111a_FF042_007	2-18-55	Bull 1 Addn 2	
A14	INTERIOR ELEVATIONS – BLOCK “B” MHG_111a_ FF042_010	2-18-55	B1 A2	
A15	INTERIOR ELEVATIONS – BLOCK “C” MHG_111a_ FF042_012	2-18-55	B1 A2	
A16	INTERIOR ELEVATIONS – BLOCK “D” MHG_111a_ FF042_014	2-18-55	A 2	
A17	CABINET DETAILS – BLOCK “B” MHG_111a_FF043_002	2-18-55	B1	Details 211 – 213. Sections through fireplace, cabinets
A18	CABINET DETAILS – BLOCK “C,” “D” MHG_111a_ FF043_003	2-18-55	A2	Sections through cabinets
A19	CABINET DETAILS MH-G_111a_FF043_005	2-18-55		
A20	BATHROOM ELEVATIONS MHG_111a_FF043_008	2-18-55	B1, A2	

A21	BATHROOM DETAILS MH-G_111a_FF043_010	2-18-55	B1, A2	Details 300 - 320
A22	KITCHEN ELEVATIONS MH-G_111a_FF043_012	2-18-55	A1, A2, B1	
#	**TITLE**	**DATE**	**REV**	**NOTES**
A23	KITCHEN DETAILS MH-G_111a_FF043_014	3-3-55	A1	Kitchen details not issued with first set. "To follow as addendum" on dwg list. Details 341 – 346. Plus sections through counters, cold room
A23A	KITCHEN DETAILS MHG_111a_FF043_016	3-3-55	A1	Sheet issued for bidding Details 351 - 365
A24	ROOM FINISH & DOOR SCHEDULE MHG_111a_ FF043_018	2-18-55	R1, A2	Details 451 – 467 Door and Frame Types Finish Schedule includes references to details and elevation dwgs
A-25-AS	Painting, Lighting, Living Room			
A-26-AS	Painting, Lighting, Dining Room			
A-27-AS	New Fence			
S1	BASEMENT & FIRST FLOOR PLANS	2-18-55	A2	General notes on concrete & footings. Detail precast conc. slabs.

S2	ROOF FRAMING PLAN	2-18-55	A2	General notes, steel "The special construction of this building requires that tolerances lower than those usually accepted for structural steel must be maintained. Exposed structural steel sections used must be selected straight and true along both axes and must remain so when erection is completed. Exposed corners must be absolutely square, flush and smooth."
M1	BASEMENT PLAN & DETAILS	2-18-55	A2	Radiant heating system Refrigeration piping rev 11/22/55
M2	FIRST FLOOR PLAN	2-18-55		Symbol key. Duct layouts.
P1	SITE & ROOF PLANS	2-18-55		Note: most of M & P drawings are faded. Site utilities. Symbol list. Detail subsoil drain.
P2	BASEMENT PLAN & DETAILS	2-18-55		Diagram hot & cold water piping. Fountain for dining table. Section through well water storage tank.
P3	FIRST FLOOR PLAN	2-18-55		Detail control valve for dining table
P4	RISER DIAGRAMS & DETAILS	2-18-55		
	Mechanical Control Systems	7-28-55		Honeywell Minneapolis
E1	RISER DIAGRAMS	2-18-55		Burglar Alarm System, Fire Alarm System
E2	BASEMENT PLAN	2-18-55		
E3	FIRST FLOOR PLAN	2-18-55		
	REVISIONS			
R1	Revised Plan of Cold Room	9-8-55		Revised shelving widths/plan
R2	Revised details of Cold Room Door #16	9-8-55		

R3	Revised Plan, South End of Storage Wall	9-8-55		
R4	New Record Storage Revised Storage Wall Elevation & Section	9-8-55		
R5	Marble Sideboard, Room #8	10-14-55	B3	
R6	Padouk Step (conversation pit), Room #6	10-14-55	B3	

	SKETCHES			
SK-1	Location of Music System	6-30-55		
#	**TITLE**	**DATE**	**REV**	**NOTES**
SK-1	Proposed Revision Skylight Detail	10-5-55		
SK-2	Clarification of Skylight Closure Details	10-28-55		
SK-3	Clarification of Skylight Closure Details	10-28-55		
SK-4	Terrazzo Pattern	11-22-55		"Preliminary"
SK-4	Terrazzo Pattern	11-30-55		Reissued 12/12/55 Reissued 1/25/56
SK-5	Kitchen Equipment Layout	3-28-1956		Revised 4/12/56 and 5/23/56
SK-6	Laundry Equipment Layout	4-29-56		3 Sheets, including perspective views, plans & elevations
SK-7	Master Bedroom Details	5-10-56		
SK-8	Switch plates & convenience outlets	5-21-56		
SK-9	Laundry Room Details	5-22-56		Rev 1/7/57

SK-?	Alternate speaker face for Cabinet #8	3-22-57		
SK-10	Proposed Millwork Modifications	1-18-56		
SK-11	Revision of Kitchen to include Rubbish Chute Room 11	7-6-56		Rev 10-30-56
SK-12	Barbecue Cabinet Detail	8-27-56		
SK-13	Storage Unit #15	9-4-56		
SK-14	S Wall, Master Bedroom	11-23-56		
SK-15	Landscape Plan & Detail			
SK-16	Storage Room Unit #29	10-12-56		
Sk-17	Mirror Detail Room #27	11-7-56		
SK-18	Revised Drying Cabinet	11-7-56		
SK-19	Towel Bar Details	11-21-56		
SK-20	Wall Revision betw Doors #16 and 17	11-30-56		
SK-21	Fireplace	12-10-56		Rev 21 Dec 56, Flue & Smoke Chamber, 1-24-57
SK-22	Yard Screen			
SK-23	New Storage Cabinet Room #31	12-21-56		
SK-24	TV Face Panel	1-22-57		
SK-26	Sewing Table Detail	2-21-57		
SK-27	Post Plan & Detail	3-27-57		
SK-28	Tapestry Screen	3-3-57		
SK-31	Landscape Plan			
SK-33	Greenhouse and Storage Building Sections and Details			
SK 34	Barbecue top arm	7-14-57		
SK-40	Site and Grading Plan for North Garden			
SK-42	Revision to Children's Bed	12-2-57		

REPAIRS, RENOVATIONS, REVISIONS

Note: FILE C, Specific Construction Projects & Renovations folders with 1956/57 dates typically include shop drawings for millwork, skylights, etc. Those have not been tabulated here.

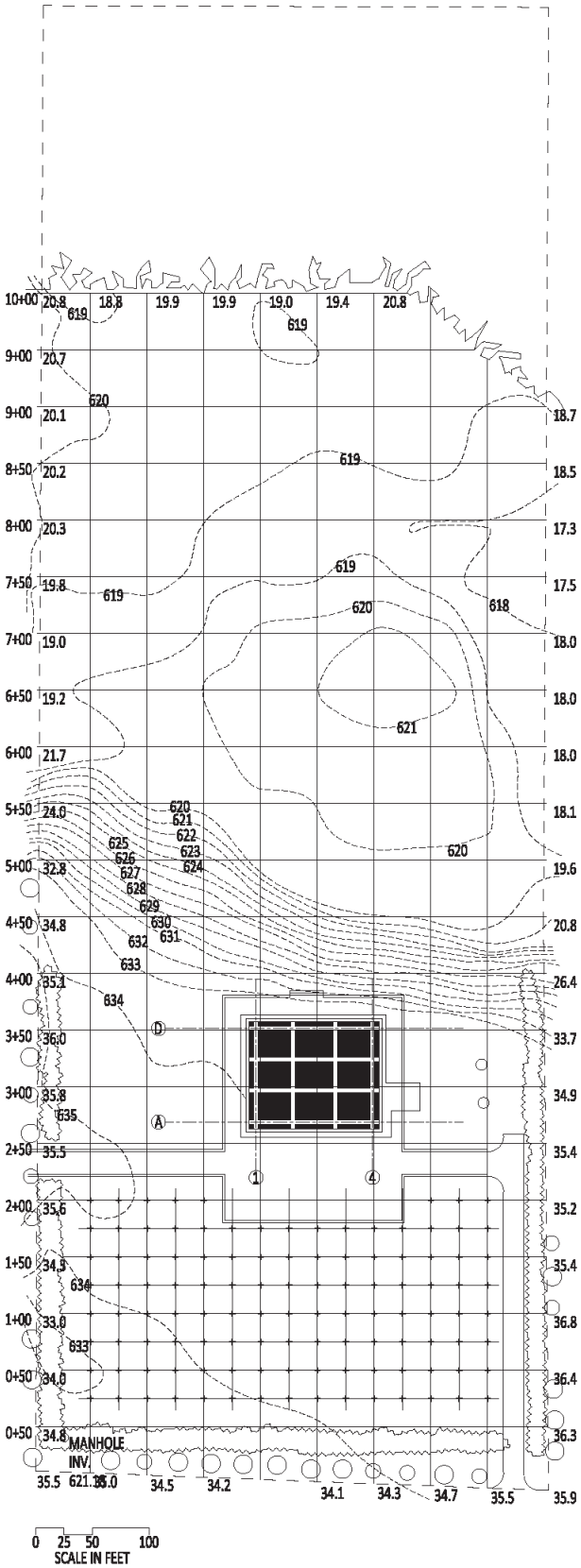
	MECHANICAL			
M1	Humidification System	5-31-67		Lewis Assoc., Consulting Engrs, Chicago This is not same as original M1
M1	Annotations on original M1	11-16-81		New gas pipe installed. See handwritten notes
M1	Miller Mechanical Room Existing Plan & Proposed Plan	1-12-99		Dunlap & Co Inc., Columbus IN
	LIVING ROOM	1994-95		Kevin Roche John Dinkeloo & Assoc
	Plan/sections options for Conversation Center revisions	7/11/94		
	Section detail conversation pit	Faxed 9/16/94		
S-1	Conversation Center	9/16/94 Rev 9/21/94		Plans, sections details
	Detail Section Seating	Rev 10/17/94		
S-1	Conversation Center	9/16/94 7 Revisions 11/9/94		Plans, sections details Increased seat depth & counter depth
SK-1	Stair Elevation Conversation Center	3-16-95		
1960	**POOL & BATH HOUSE**			Eero Saarinen & Assoc.
	Schematic Plans & elevations	6-29-59		
	Perspective sketch	n.d.		
	Site Plan of Swimming Pool and Bath House			12/27/59 (on tracing)

	Elevation of Swimming Pool and Bath House			12/27/59 (on tracing)
	New Swimming Pool	7-14-?? Rev 7-17-59		Notes: specs for house shall govern construction. Site plan, plan detail and section. No pool house.
A-1	Bath House – Site & Floor Plans	5-25-60		Location west of House. Plus elevations. Notes serve as specifications. Alternate to omit Bath House & construct Equipment House
A-2	Bath House Details	5-25-60		Incl. RCP and framing plans
A-3	Bath House Details	5-25-60		
1998	POOL REVISIONS			Kevin Roche John Dinkeloo & Assoc
	Stair Options	7-27-98		
	Columbus Pool Stair	7-27-98		New ladder and concrete stairs w/ railing.
	TV ROOM DEN			
	Carpet design	3-6-62		Alexander Girard
	Modifications in TV cabinet	11-12-83		Columbus Custom Cabinets – 5 sheets
	Modifications in TV cabinet	1-21-88		Columbus Custom Cabinets– 5 sheets Addition of box in TV cabinet for new disc player, Convert Tape storage to CDs, etc.
1962	**BARN**			
	Preliminary Layout	6-1-62		Harry Weese & Assoc. Plan options and sections (four sheets all at similar stage of development)

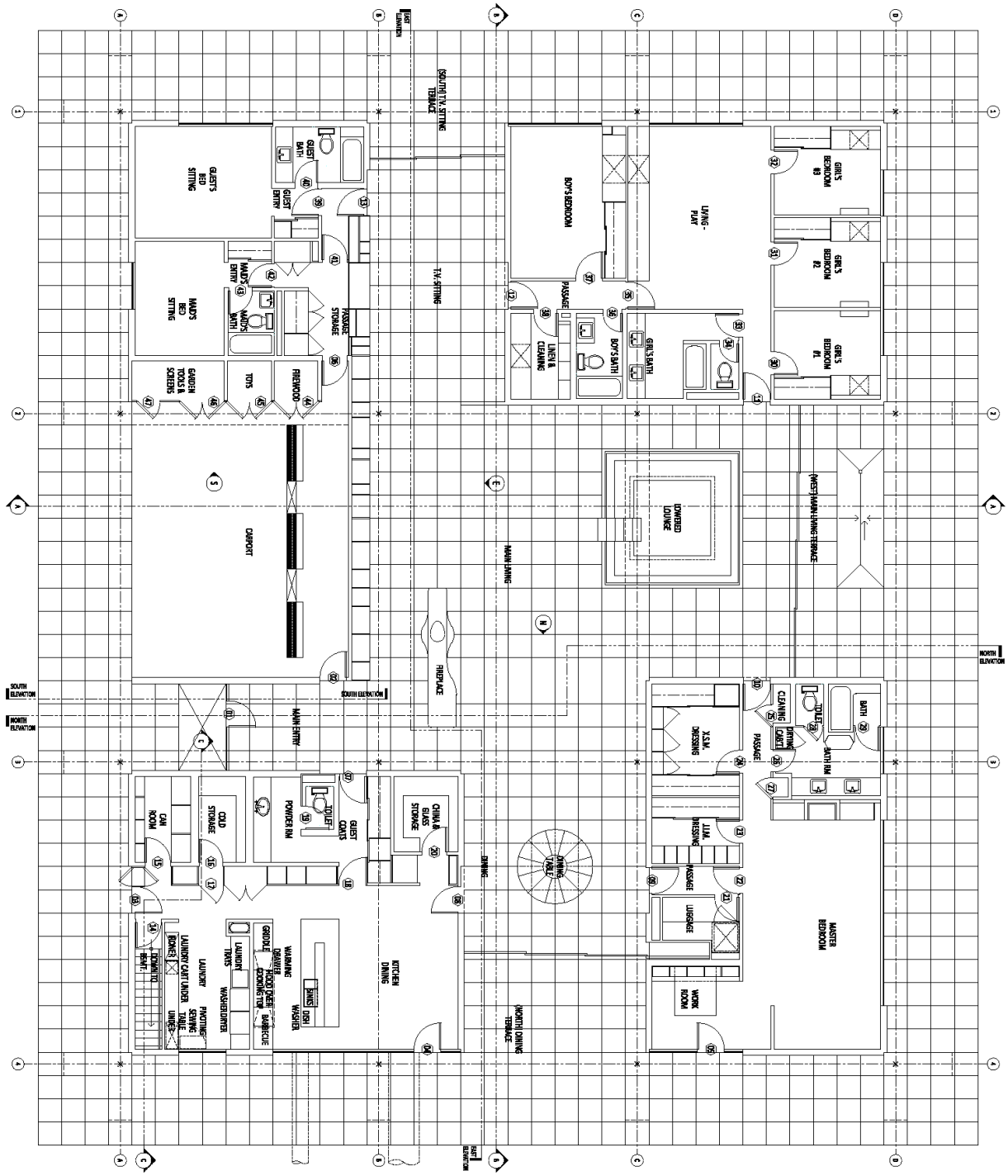
1964	**LIGHTING**			
	Painting, Lighting, Dining Room	8-4-64		Eero Saarinen Recessed lighting for art-work (Braque,) elevations & sections. Also includes cut sheets for fixtures.
	Painting, Lighting, Living Room	6-25-65 7-8-65		Recessed lighting for artwork (Pierre Bonnard, Vue du Cannet, acquired May 1967??) elevations & sections. Also includes cut sheets for fixtures.
1970	**GUEST SUITE**			
	Lavatory cabinet	8-1-70		A. Dean Taylor, Columbus, IN
	Guest Suite revisions	5-1-74		Kevin Roche John Dinkeloo & Assoc New doors between rooms. Various door options studied.
1	Guest Suite revisions	5-20-74		Roche Dinkeloo. Later revised 6-7-74, 6-27/74
	Combination seat & luggage rack	1-22-79		A. Girard
	Undated, unidentified marked up blackline			Shows partition between Guest's Bedroom and Guest's Sitting Room moved to center of space.
1972	**GREENHOUSE OFFICE RENOVATION/LIBRARY**			
	Miller Library	3-18-70		Unidentified. Roche Dinkeloo? Section/elevation

	Miller Library, Section D-D	5-25-70		Unidentified. Roche Dinkeloo? Plan/section/elevation
	J.I.M. Office	n.d.		Floor plan and furniture layouts. Freehand. Not identified. Girard?
	Southeastern Supply Millwork	11-13-72		Bookshelves
7	Study Plan & piping layouts	11-27-72		Dunlap Mechanical
	Elevation & section			Girard handwriting
1	Floor Plan & Reflected Ceiling Plan	8-7-70		Alexander Girard
	Heating & Air Conditioning Plan	Rev. 11/22/72		
	Electrical Plan	nd		Fixture types & locations. No source.
1972	OFFICE FOR XENIA MILLER			
	Carpet layouts	6/30/72		Alexander Girard. Several sketches in this series with same date.

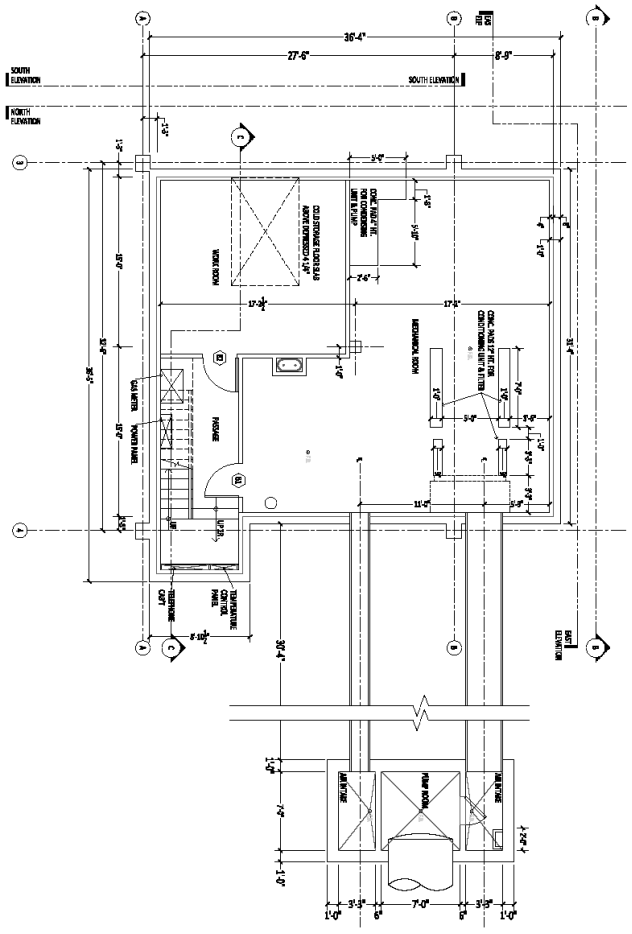
Appendix D: Base Drawings



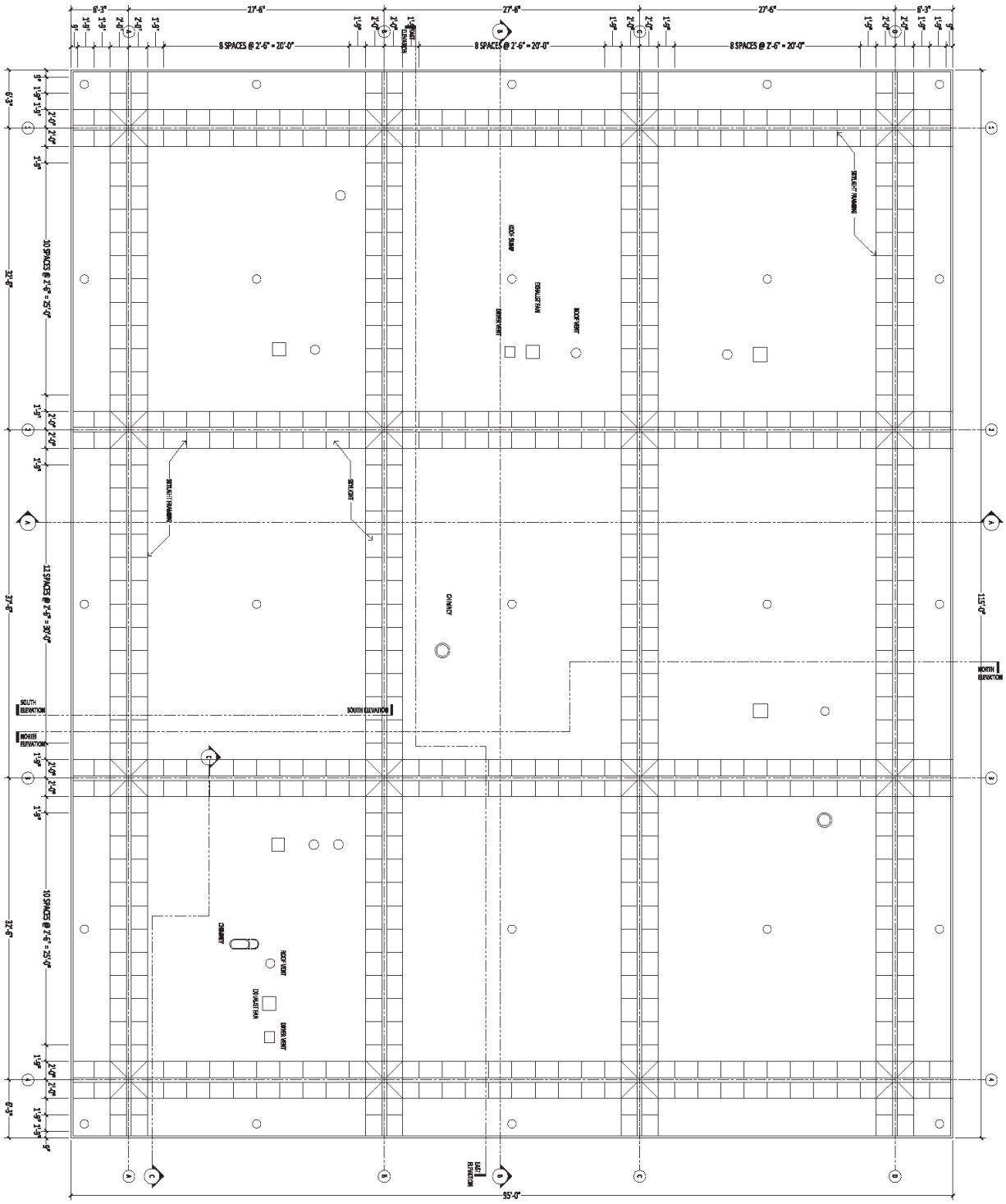
Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: **Site Plan**		SHEET IDENTIFICATION: **A.00.01**
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH	SCALE: 1 = 100'-0" DRAWN BY: Greg Maxwell, AIA



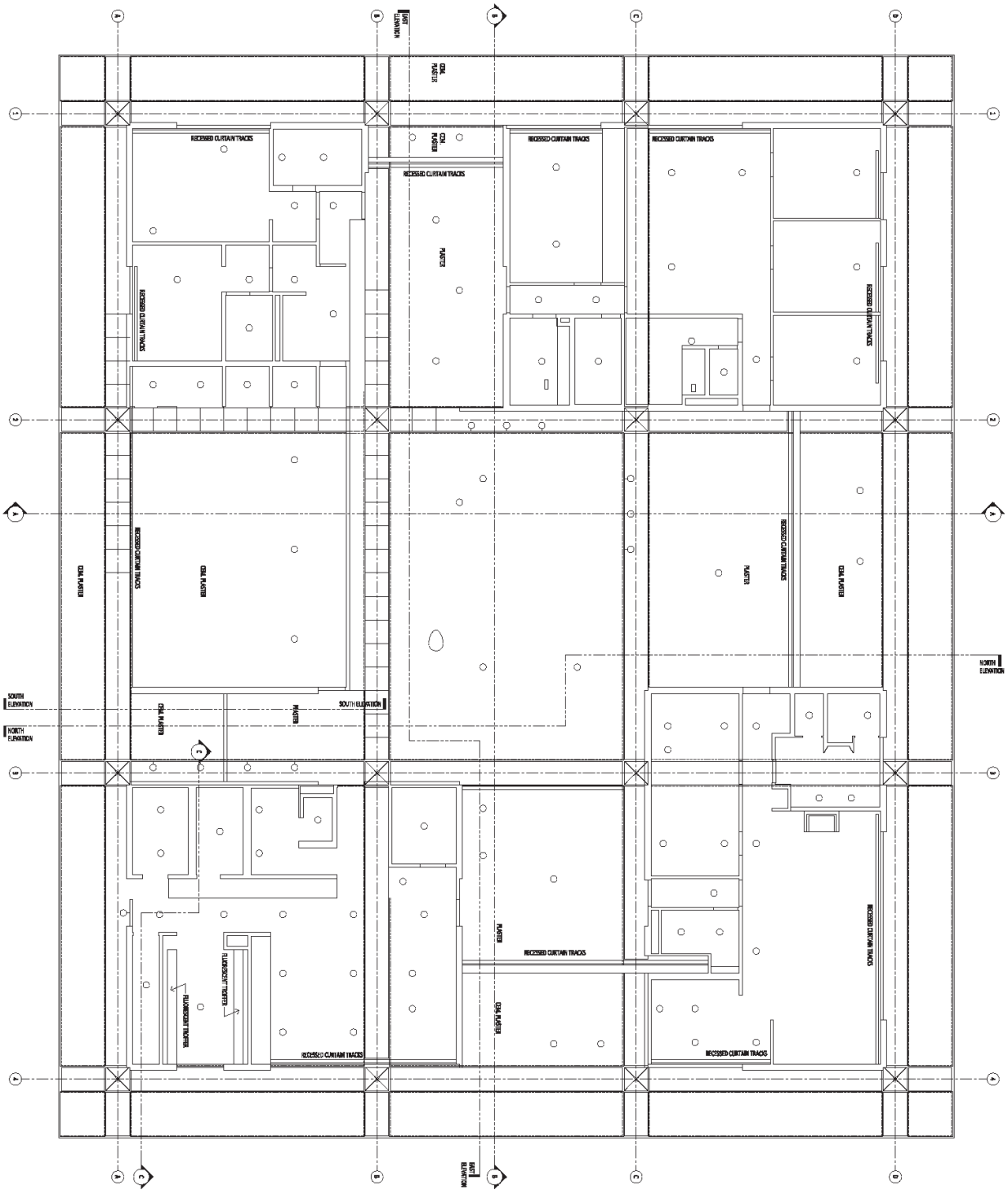
Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: **First Floor Plan**		SHEET IDENTIFICATION: **A.01.01**
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH 0 2.5 5 10 20 SCALE IN FEET	SCALE: 3/32" = 1'-0" DRAWN BY: Greg Maxwell, AIA



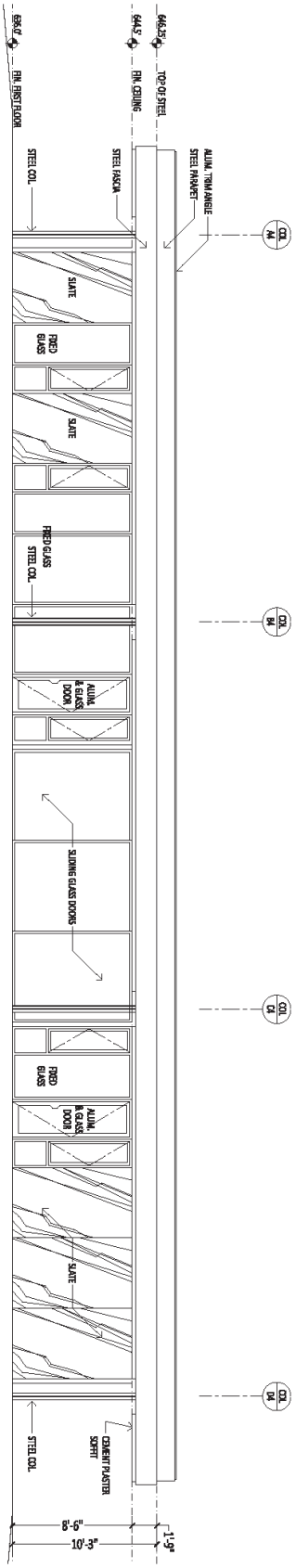
Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: **BASEMENT PLAN**			SHEET IDENTIFICATION: **A.01.02**
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH	0 2.5 5 10 20 SCALE IN FEET	SCALE: 3/32" = 1'-0" DRAWN BY: Greg Maxwell, AIA



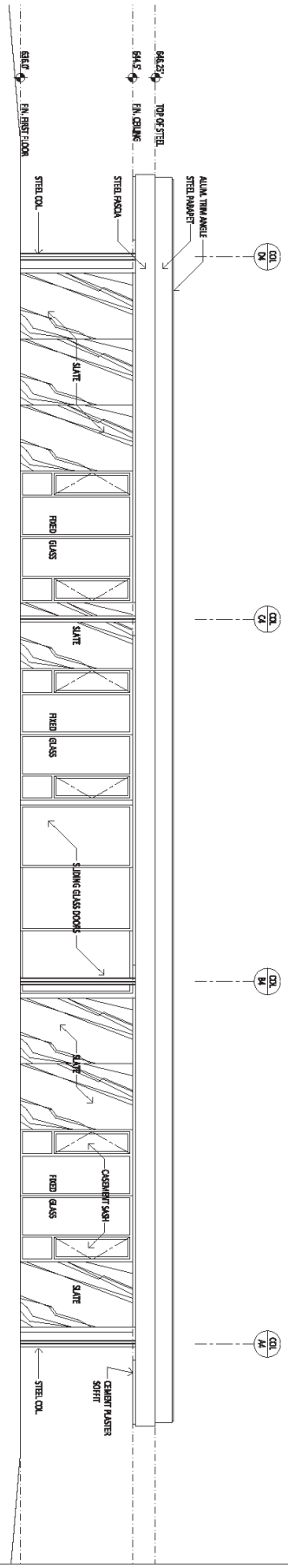
Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: **Roof Plan**		SHEET IDENTIFICATION: **A.01.03**
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH 0 2.5 5 10 20 SCALE IN FEET	SCALE: 3/32" = 1'-0" DRAWN BY: Greg Maxwell, AIA



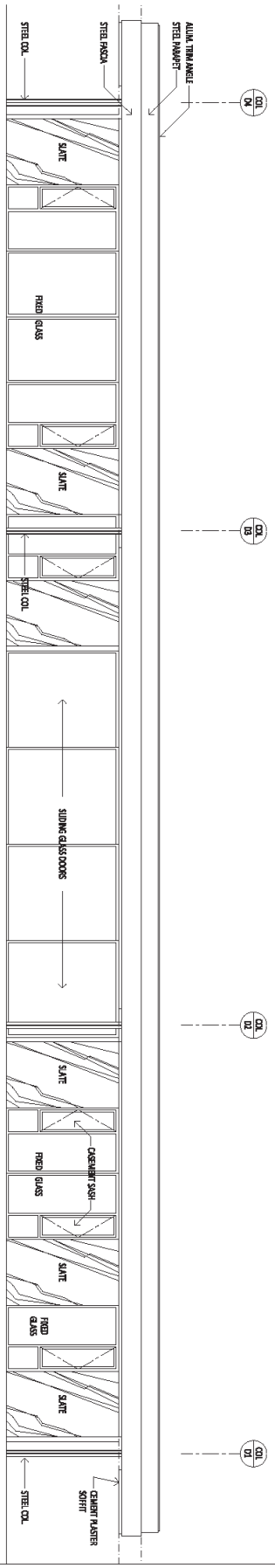
Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: **Reflected Ceiling Plan**		SHEET IDENTIFICATION: **A.01.04**
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH 0 2.5 5 10 20 SCALE IN FEET	SCALE: 3/32" = 1'-0" DRAWN BY: Greg Maxwell, AIA



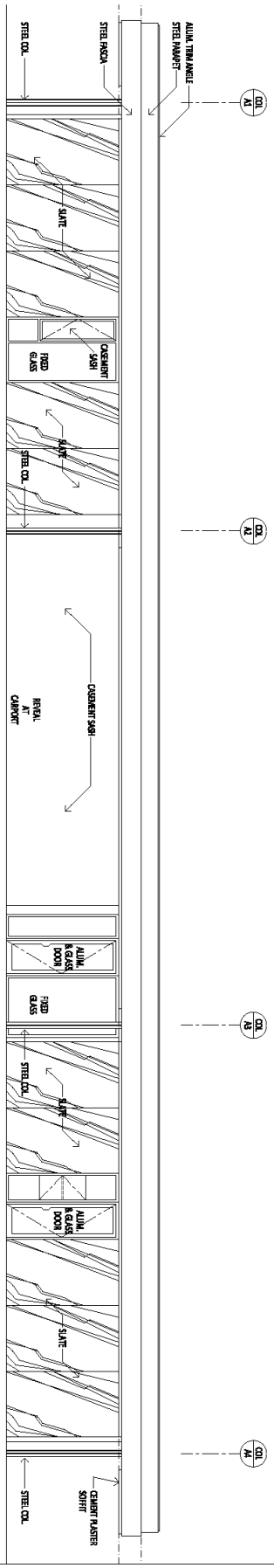
Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: **North Elevation**			SHEET IDENTIFICATION: **A.02.01**
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH	0 2.5 5 10 SCALE IN FEET	SCALE: 1/8" = 1'-0" DRAWN BY: Greg Maxwell, AIA



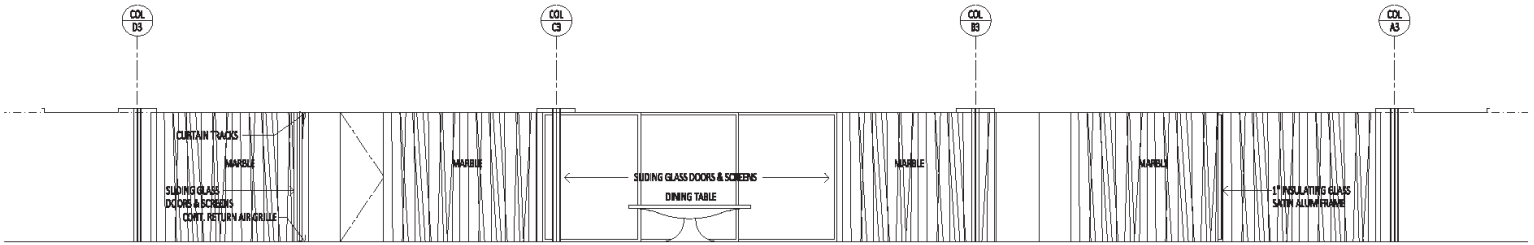
Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: **South Elevation**			SHEET IDENTIFICATION: **A.02.02**
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH	0 2.5 5 10 SCALE IN FEET	SCALE: 1/8" = 1'-0" DRAWN BY: Greg Maxwell, AIA



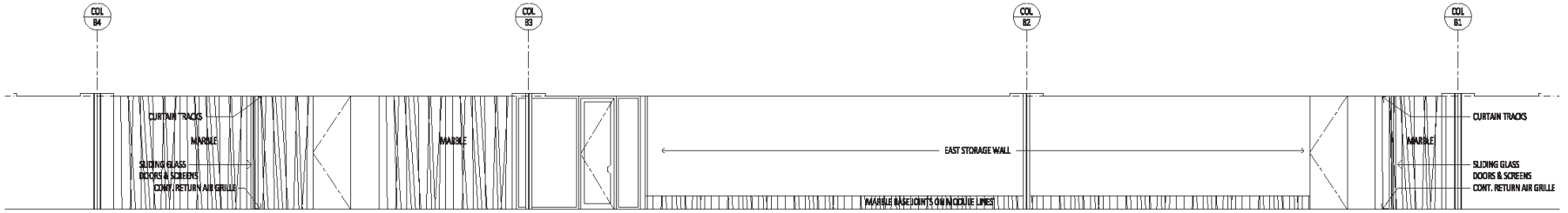
Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: West Elevation			SHEET IDENTIFICATION: A.02.03
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH	0 2.5 5 10 SCALE IN FEET	SCALE: 1/8" = 1'-0" DRAWN BY: Greg Maxwell, AIA



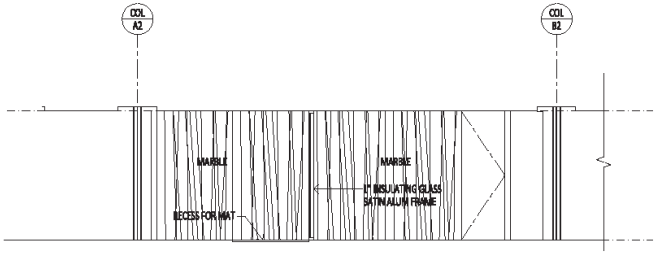
Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: East Elevation			SHEET IDENTIFICATION: A.02.04
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH	0 2.5 5 10 SCALE IN FEET	SCALE: 1/8" = 1'-0" DRAWN BY: Greg Maxwell, AIA



1 | NORTH



2 | EAST



3 | SOUTH (AT MAIN ENTRANCE)

SHEET IDENTIFICATION: A.02.05

SCALE: 1/8" = 1'-0"

DRAWN BY: Greg Maxwell, AIA

0 2.5 5 10 SCALE IN FEET

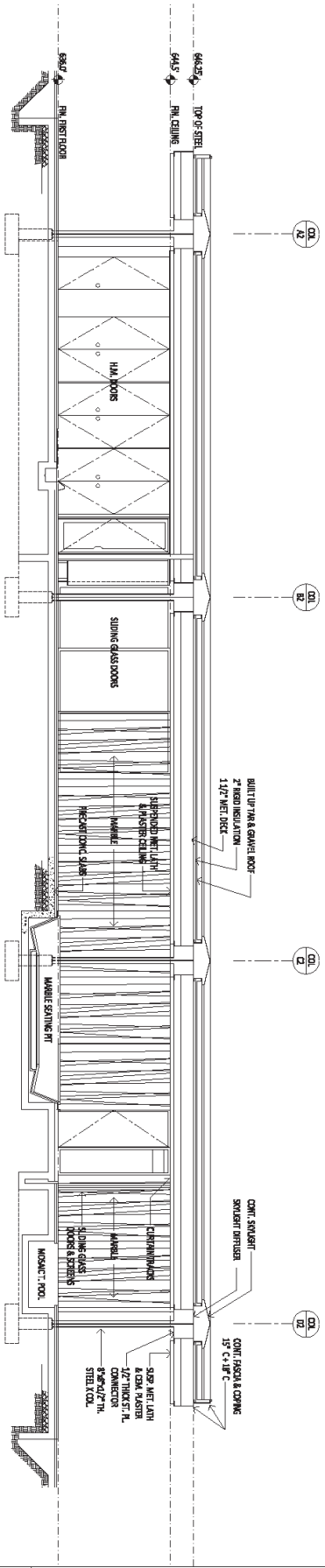
NORTH

SHEET DESCRIPTION: INTERIOR ELEVATIONS

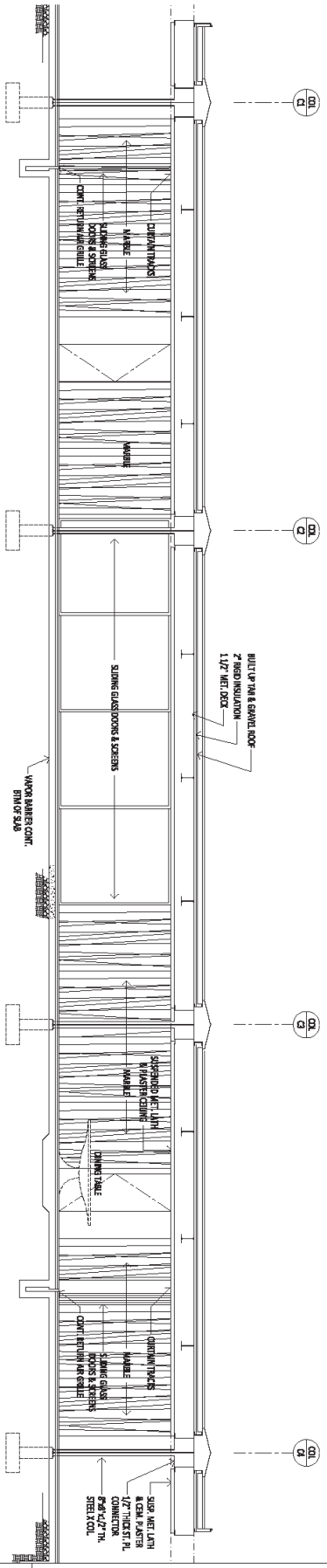
PROJECT MEMBER NAMES

Miller House and Garden
2760 Highland Way
Columbus, IN 47201

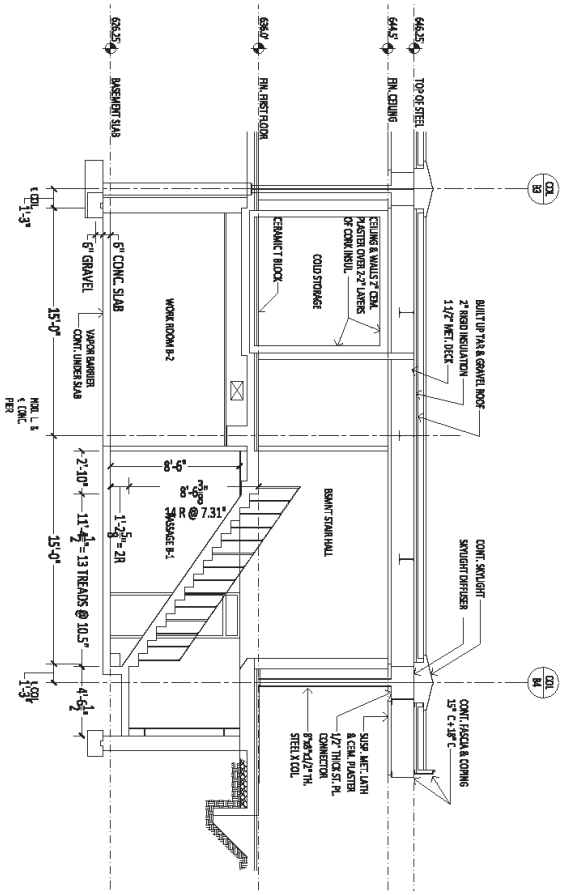
PennPraxis
Graduate Program in Historic Preservation
Weitzman School of Design - University of Pennsylvania



Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: SECTION A-A (VIEW LOOKING SOUTH)		SHEET IDENTIFICATION: A.03.01	
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH	0 2.5 5 10 SCALE IN FEET	SCALE: 1/8" = 1'-0" DRAWN BY: Greg Maxwell, AIA



Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: SECTION B-B (VIEW LOOKING WEST)			SHEET IDENTIFICATION: A.03.02
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH	0 2.5 5 10 SCALE IN FEET	SCALE: 1/8" = 1'-0" DRAWN BY: Greg Maxwell, AIA



Miller House and Garden 2760 Highland Way Columbus, IN 47201	SHEET DESCRIPTION: **SECTION C-C (VIEW LOOKING WEST)**			SHEET IDENTIFICATION: **A.03.03**
PennPraxis Graduate Program in Historic Preservation Weitzman School of Design - University of Pennsylvania	PROJECT MEMBER NAMES	NORTH	0 2.5 5 10 SCALE IN FEET	SCALE: 1/8" = 1'-0" DRAWN BY: Greg Maxwell, AIA

Appendix E: First Floor Plan with Room Labels


(WEST) MAIN
LIVING TERRACE
MASTER
BATH
FISH POND
ORANGE
BEDROOM
BLUE
BEDROOM
GREEN
BEDROOM
BATH
TOILET
MASTER
BEDROOM
CLEANING
DRYING CABINET
PASSAGE
J.I.M.
OFFICE
X.S.M.
DRESSING
J.I.M.
DRESSING
PASSAGE
LUGGAGE
X.S.M. OFFICE/
CHILDREN'S
PLAYROOM
GIRL'S
BATH
CONVERSATION
PIT
BOY'S
BATH
BOY'S
BEDROOM
PASSAGE
LINEN &
CLEANING
LIVING ROOM
DINING
TABLE
(NORTH) DINING TERRACE
DINING
FIREPLACE
(SOUTH) T.V.
SITTING
TERRACE
TV/DEN
CHINA &
GLASS
STORAGE
STORAGE WALL
GUEST COATS
KITCHEN
GUEST
ENTRY
PASSAGE/ STORAGE
GUEST
BATH
FIREWOOD
MAIN
ENTRY
POWDER
RM
MAID'S
ENTRY
MAID'S
BATH
TOYS
CARPORT
GUEST
BEDROOM/
WORKROOM
MAID'S
BED/
SITTING
GARDEN
TOOLS
&
SCREENS
COLD
STORAGE
LAUNDRY
KITCHEN UTIL.
COSET
DOWN TO BSMT.

Appendix F: BCA Report on Materials Conservation Issues

Miller House — Summary of BCA's Field Observations

BCA performed a site visit to the Miller House on June 1 and 2, 2021. The goal of the visit was to assess the condition of significant architectural materials throughout the house. The following architectural materials were assessed:

- Exterior:
  - Plaster (soffits)
  - Paint finishes (plaster; steel)
  - Slate and marble wall cladding
  - Aluminum components of window and door assemblies
  - Terrazzo paving
  - Grouts, sealants, etc.
- Interior:
  - Plaster (ceilings; walls)
  - Paint finishes (plaster; steel)
  - Marble wall cladding
  - Wallpaper and fabric coverings
  - Micarta laminate (walls, doors, countertops)
  - Aluminum components of window and door assemblies
  - Wood veneer (bookshelves, closets)
  - Terrazzo and travertine flooring
  - Tile walls and flooring
  - Grouts, sealants, etc.
- Site Features
  - Glazed espaliers
  - Z-lock Pavers
  - Iron gates
  - Stone platform and bench
  - Concrete pavers, curb, and stair

Other members of the team assessed the site and landscape, roof and drainage system, steel structural elements, window glazing, MEP and security systems, and building environment.

Exterior

Plaster

The house's deep soffits contain a narrow inner perimeter of laylights and a wider outer perimeter finished with cement plaster (Figure 1). Saarinen's specifications called for three coats of the following mix (by volume):

- 1 part portland cement
- 3 parts sand
- ¼ part lime putty

Today, the cement plaster varies in appearance and texture among the four sides of the house. In some locations, the plaster has a smooth texture; at others, it has a rough texture. In many locations it is also apparent that the soffit plaster has been previously repaired, likely due to water damage. BCA believes that the smooth textured plaster represents the original intended finish, and that areas of textured plaster represent locations of previous repairs. BCA did not identify notes in the drawings or specifications related to plaster texture.

Probably due to ongoing maintenance and repair, the cement plaster does not exhibit notable deterioration conditions despite known roof drainage issues.

Figure 1 West soffit of house, looking south. Note the wide textured plaster soffit; the light to the left is coming through the laylights.

Paint Finishes

The house features a grid of X-shaped columns at its interior and exterior. These columns support steel beams that form the ceiling structure; additional beams at the perimeter of the house serve as fascia (Figure 2). All of this steelwork is currently painted white. The cement plaster described in the previous section is also painted white. Saarinen specified Dupont products for both elements: "'Duluxe' metal protective finish" for the steel, and "Cement and Stucco Paint" for the cement plaster. However, he indicated that those products were referenced solely as a quality standard, and that equal or better products could be submitted for approval.

In general, the painted finishes of both materials are sound. However, the paint on the steel of the house's fascia and exterior columns shows evidence of repeated touch-up campaigns (Figure 3). In fact, the steel's paint was being touched-up at the time of BCA's survey. Most of the repairs appear to be at locations of roof leaks.

Figure 2 Southeast corner of the house, looking west. Note the row of white steel X-shaped columns. Both tiers of the soffit are C-shaped steel beams, oriented to open inwards.

Figure 3 Evidence of many touch-up campaigns at fascia of steel eaves, southwest corner of house.

Slate and Marble Wall Cladding

Most of the house's outer perimeter walls are clad with large slabs of slate (Figure 4). At a few more protected locations, the walls are clad with slabs of marble which appear to match those at the primary spaces of the interior. Saarinen's specifications stated that marble walls were to be "Madre Cream Alabama," as quarried by the Moretti-Harrah Marble Co. of Sylacauga, Alabama, with a "white-sand sawn" finish. The slate was to be Buckingham, Virginia slate with a natural cleft finish. According to the original drawings, both types of slabs were to be anchored into concrete block backup masonry (Figure 5). A membrane flashing was to be installed behind the bottom of the slab and under the terrazzo below. All perimeter joints were to be caulked: between the slab and the concrete backup at the top and sides, and between the slab and terrazzo at the bottom. The slate and marble slabs were to have a nominal thickness of 1¼" and the joints to be caulked were to be approximately $^{3}/_{8}$".

At many locations, the current condition of the stone slabs does not match the original drawings. It was not possible to determine whether the discrepancies have existed since the time of construction or are due to later movement. At the top of most slabs, the joint between the slab and the backup masonry is open, and in other cases is sealed with mortar (Figure 6). In no case is sealant present at this joint. Many of the joints, particularly at the slate slabs, are well in excess of $^{3}/_{8}$", and in some cases are greater than 1" (Figure 7). To some extent, these large gaps may be due to variations in the thickness of the slate slabs, likely the result of natural cleavages in the stone; the rougher side of the stone was mounted facing inward, resulting in an uneven joint (Figure 8). However, in many locations mortar and other residue was noted in the cavity between the stone and the backup masonry, raising the possibility that the stone is jacking away from the backup (Figure 9). Whether the specified bronze anchors provide any resistance to such lateral movement is unknown. Fortunately, no evidence of water infiltration into these cavities was noted, despite the house's known roofing and drainage issues.

At the bottom of the slabs, sealant is missing in some locations, which allowed the team to note that the slabs do not appear to rest on the terrazzo as originally detailed. Rather, the terrazzo appears to stop short of the slabs (Figure 10). It is possible that construction sequencing required the terrazzo to be installed after the stone slabs. It is also known that much of the terrazzo has shifted since construction, which may explain the gap (see *Terrazzo*, below). In any case, it is unknown whether any material supports the stone slabs from below, or whether they are hung entirely from anchors.

Several other conditions were noted at the slate cladding:

- Vertical hairline cracks were noted in several slate slabs (Figure 11). It is unknown whether these cracks are inherent to the stone or are related to the open joints noted above.
- Suspected guano was identified on the face of some slate slabs, consistent with the reported nesting of bats in the vicinity (Figure 12). The guano appeared to be staining the stone (Figure 13).
- Some of the sealant used at the vertical joints between slate slabs appears to be staining the adjacent stone (Figure 14).
- At one region at the southwest of the house, one slate slab had the appearance of wicking moisture from their base during a rain event (Figure 15). This effect was not apparent on the previous, dry day. As discussed above, there is reason to believe that the bases of the slabs were not waterproofed as originally detailed. The house's drainage system also converges near this location (see *Terrazzo*).
- Horizontal scratches were noted at the base of several slate slabs (Figure 16). These scratches may relate to the use of Baker scaffolding at the exterior of the building for maintenance purposes (Figure 17).

Fewer conditions were noted at the marble cladding:

- At one location at the north of the house, subtle vertical streaking or staining possibly related to past water leaks at the laylight above (Figure 18).
- At one location at the west of the house, the marble is damaged from two anchor holes where art used to hang (Figure 19).

Figure 4 Large slat slabs along the east wall of the house, typical.

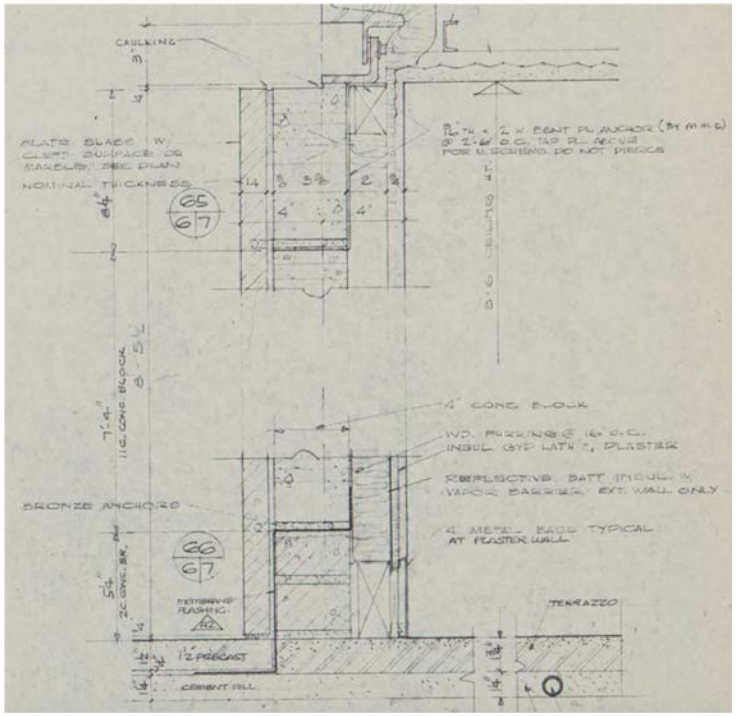


Figure 5 Detail from sheet A-7 of the original drawings showing the slate and marble slab installation. Note that the exterior terrazzo was originally indicated as precast concrete.

Figure 6 Tops of slate slabs showing deteriorated mortar at top joint with CMU backup (blue arrow), typical. Note also deteriorated sealant at joint with metal angle (orange arrow), typical.

Figure 7 Gap between concrete backup and slate slab in excess of 1". However, note that the joint between the steel angle in the foreground and the slate slab is close to the 3/8" specified in the drawings.

Figure 8 Top of slate slab with joint relatively intact. Note the difference in the joint width between the foreground and background of the photograph.

Figure 9 Top of slate slab with joint entirely open. Note the large amount of debris in the cavity.

Figure 10 Gaps in sealant show what appears to be the edge of the terrazzo (arrows), which stops short of the slate. Note also that the divider strip cover clearly stops short of the slate.

Figure 11 Widest of the hairline cracks in the slate. Other cracks appear more associated with natural veining.

Figure 12 Region of suspected guano, southwest corner of house.

Figure 13 Detail of suspected guano showing apparent staining in the vicinity.

Figure 14 Apparent staining adjacent to sealant joint in slate, typical.

Figure 15 Slate at southwest corner of house on dry day (left) and during a rain event (right).

Figure 16 Horizontal scratches (arrows) near base of slate slabs, typical.

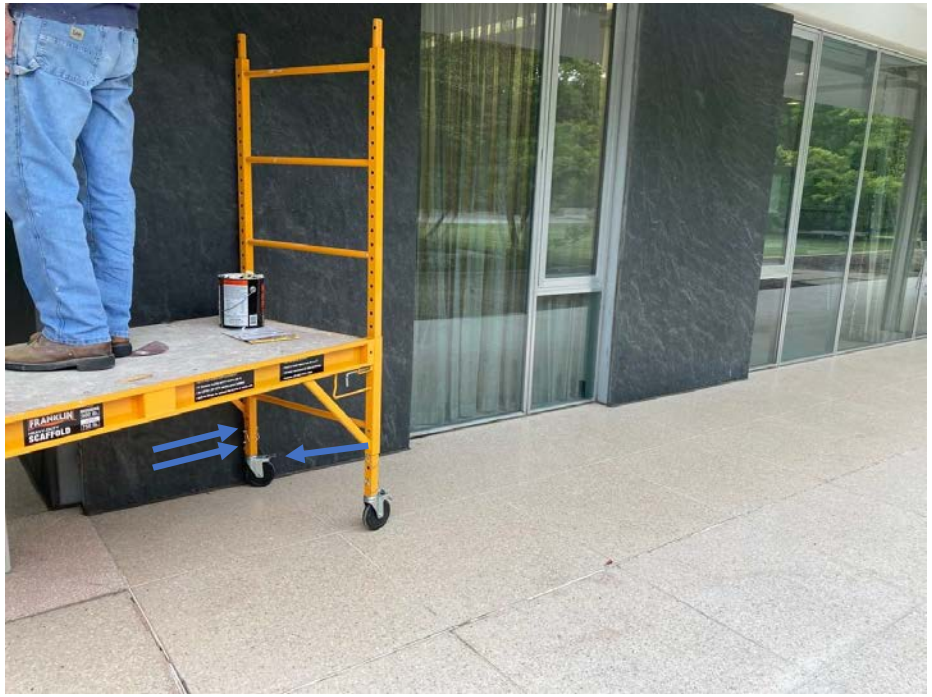


Figure 17 Potential points of contact between Baker scaffold and slate (arrows).

Figure 18 Subtle vertical streaks near laylight at edge of marble slab, north of house.

Figure 19 Two small losses at anchor points where art was formerly hung, west of house.

Terrazzo

Below the soffits, the exterior of the house is paved with terrazzo that is essentially a continuation of the interior terrazzo flooring (Figure 20). The original drawings depict the exterior paving as precast concrete, so at some point a decision was made to make the materials more uniform. For this reason, the original drawings and specifications do not include installation details explicitly for the exterior terrazzo.

The exterior terrazzo exhibited by far the most deterioration of any feature surveyed. Further, documentary evidence suggests that there have been problems with the terrazzo virtually since its installation.

The most significant conditions noted during BCA's survey were cracking and displacement. Cracking is widespread but is most concentrated at the four corners of the paving, near embedded steel columns, and at the south side of the house (Figure 21). Cracking is least prevalent at the west of the house. Displacement was noted at all four corners of the paving but was most significant at the southwest corner, where a substantial region of the paving appears to have moved as much as much as an inch away from the house (Figure 22).

At exposed edges of the terrazzo, it is evident that the terrazzo panels and their setting bed now overhang the concrete slab on which they were installed (Figure 23). It is unclear to what extent this is due to the upper layers sliding relative to the lower layers, and to what extent the setting bed has eroded away. In any case, the overhang has resulted in additional cracking and losses, likely from people stepping on unsupported terrazzo (Figure 24).

Records of correspondence indicate that the Millers had some of their terrazzo—at the corners of the house—replaced as earlier as 1964, and possibly again shortly thereafter due to an unsatisfactory color match. (BCA did not note a discrepancy in color at the corners of the paving.)[1] In 1985, cracked terrazzo at the steel columns was replaced, resulting in a poor color match that is still apparent today (Figure 21). In 1994, the original installers honed down the surface, performed repairs to make cracks less noticeable, and sealed the terrazzo. However, by 2000 the terrazzo had deteriorated again to the point that the family was considering wholesale replacement, either in kind or with an alternative material.

The early and recurring problems with the terrazzo strongly suggest defects in construction. In 1994, the original installers noted that the terrazzo had been poured without adequate expansion joints. This defect alone may be responsible for much of the cracking and suspected movement of the paving. Further, the metal dividers were originally covered with U-shaped plastic covers, most of which eventually cracked and allowed water to corrode the dividers (Figure 25). Movement of the paving has also resulted in increasingly wide joints, many of which have been filled with sealant that has since failed (Figure 26).

[1] The information in this paragraph comes from an Excel file provided by Newfields titled ARC_M003_Reference_TerrazzoNotes_2013-05 with transcriptions of correspondence related to the terrazzo.

Finally, the team noted that the worst of the terrazzo displacement at the southwest of the house occurred near the confluence of the house's subsurface drainpipes. It is possible that leaks or blockages in the drains are contributing to the displacement of the terrazzo paving. Miller House staff were unaware of any past investigation into or cleaning of the subsurface drains.

Other terrazzo conditions noted include:

- Staining on the black terrazzo in the carport, likely due to automobile leaks and/or road salt (Figure 27).

Figure 22 Extent of displacement at the southwest corner of the house as evidenced by the protruding units in the bottom of the photograph. Note also that every unit is cracked.

Figure 23 Terrazzo and eroded setting bed overhanging concrete slab at north of house, typical.

Figure 20 Exterior terrazzo viewed from the interior at the northwest corner of the house, where the terrazzo flooring is almost continuous.

Figure 21 Cracked and displaced (note how the joint lines have shifted) terrazzo at the southwest corner of the house.

Figure 24 Broken terrazzo at edge, typical, likely due to the unsupported condition shown above.

Figure 25 Most significant instances of corroding dividers due to plastic cover failure and water infiltration, northeast of house.

Figure 26 Widened joint at arrow has been with sealant that has failed, typical.

Figure 27 Staining at black terrazzo and dividers in carport.

Aluminum Components of Window and Door Assemblies

Those portions of the exterior walls that are not clad in slate or marble are generally composed of large glazing assemblies in aluminum frames (Figure 28). The assemblies include a mixture of fixed windows, casement windows, hinged doors, and sliding doors. The aluminum hinged doors, sliding doors, and casement windows were all specified to be produced by different manufacturers.

However, Saarinen specified that the house's aluminum work receive the same Alumalite [sic] 204 finish. According to a 1952 publication of the National Association of Architectural Metal Manufacturers, Alumilite finishes were proprietary anodization processes.[2] Anodization is the process of artificially producing a thicker version of the protective oxide coating that naturally forms on untreated aluminum. Alumilite 204 was recommended by the Association for exterior applications.

All aluminum at the Miller House is relatively protected from rain by the house's deep soffits. Typical of architectural aluminum not subjected to extreme conditions, the metal itself exhibits negligible deterioration. Small white deposits represent localized accumulation of aluminum oxides, but this surface buildup is not indicative of substrate deterioration (Figure 29). As discussed above, the same aluminum oxides typically form a self-limiting clear protective coating. No pitting or other substrate deterioration was noted, except at the door thresholds. The aluminum thresholds were typically pitted, possibly due to deicing salts or possibly due to water's collecting on the surface (Figure 30).

Some of the glazing units appear to have been replaced; sealant at the perimeter of the remaining original glazing units was generally failing (Figure 29). Sealant at the perimeter of the aluminum frames was generally failing (Figure 31).

BCA did not evaluate the window and door assemblies for operability. BCA did not evaluate the glazing itself.

[2] Earl P. Baker and Harold S. Langland, *Architectural Metal Handbook* (Washington, DC: National Association of Architectural Metal Manufacturers, 1952), 19-21, 258.

Figure 28 Fixed and operable windows in aluminum glazing assemblies at the west of the house.

Figure 29 Small white deposits of surface corrosion at aluminum window frame, typical. Note also the deteriorated sealant at arrow.

Figure 30 Pitted aluminum threshold, typical.

Figure 31 Sealant at all points in the glazing assemblies was typically failing.

Grouts, Sealants, Etc.

Sealants used at the perimeter of stone cladding are discussed under *Slate and Marble Wall Cladding*. Sealants used in the terrazzo are discussed under *Terrazzo.* Sealants used in the door and window assemblies are discussed under *Aluminum Components of Window and Door Assemblies.*

Interior

Plaster

Ceilings throughout the house are plaster. Many walls within the partitioned quadrants at the corners of the house are also plaster (Figure 32). According to the original drawings, the ceiling plaster was applied to metal lath, while the wall plaster was applied to gypsum lath (a product similar to drywall). For both applications, Saarinen specified a three-coat gypsum plaster system, with the scratch and brown coats reinforced with wood fiber, and the finish coat gauged with lime.

Very few conditions were noted at the interior plaster (or its painted finishes). The exceptions were several locations of water damage at ceilings. These areas of damage are associated with known roof leaks. The largest such area of damage is in the children's bedroom suite at the southwest corner of the house; several other areas of damage are in the office in the southeast corner of the house (Figure 33).

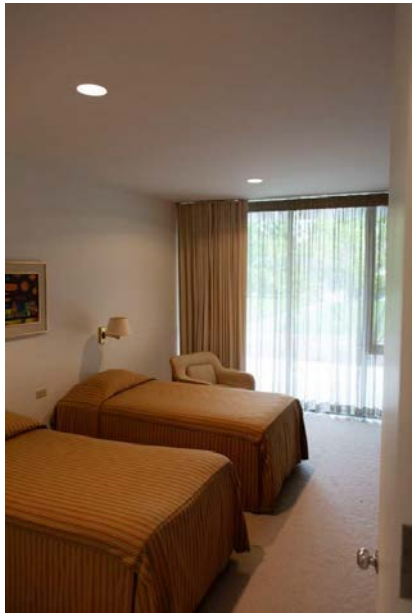


Figure 32 Plaster ceiling and walls in southwest quadrant of house, typical of enclosed private rooms.

Figure 33 Largest region of plaster damage due to roof leaks in children's bedroom suite.

Paint Finishes

Just as on the exterior, plaster walls and ceilings, as well as steel beams and columns, are currently painted white on the interior (Figure 34). As with the exterior paints, Saarinen specified DuPont products as a quality standard but invited substitutions of equal or greater quality. For the plasterwork, he specified the following system:

- One coat DuPont primer sealer
- One coat DuPont “Duluxe” interior finish—semigloss

For the steelwork, he specified:

- One coat DuPont Prep Coat No. 65-1055
- One coat DuPont body glaze putty (to fill irregularities, sanding when dry)
- Two coats DuPont “Duluxe” interior enamel—semigloss

The entire finish schedule will not be reproduced here, but Saarinen specified the same interior enamel topcoat at hollow metal features. He also specified a four-coat enamel system inside woodwork such as cabinets. For “natural finished wood,” he called for a system of neutral wood filler, sealer, and semi-floss or dull lacquer.

Interestingly, Saarinen also specified that the inside of ductwork be painted black to “beyond the point of visibility.”

The painted plaster ceilings are damaged in some locations of water infiltration, as discussed above. However, unlike at the exterior, no deteriorating paint or clear evidence of past touch-ups were noted at the interior metal finishes. In general, the interior paint finishes exhibit little deterioration. The paint in the kitchen showed the most soiling and localized wear.

Figure 34 White-painted column at rear wall, supporting white-painted beams framing the laylight. The walls of the primary central living space are clad in marble slabs identical to those at portions of the exterior.

Marble Wall Cladding

The walls of the central living area are mostly clad in large, 1¼" thick marble slabs that appear identical to those at the exterior (Figure 34). However, Saarinen's specifications state that the "Living Room Marble slabs shall be Broche Noire-polished finish." He appears to have been specifying a different marble for this space than for the exterior. However, BCA has been unable to find more information about this product. The slabs are separated by very thin vertical joints filled with grout.

No significant conditions were noted at the marble slabs. BCA observed minor discoloration at the bottom several inches of some slabs, likely due to floor polishing (Figure 35). In addition, the grout and sealant at the perimeter of the slabs is frequently failing (Figure 36). Finally, there is evidence that the metal clips for picture hanging have caused damage to the tops of some of the slabs (Figure 37).

Figure 35 Discoloration at bottom inch of marble, likely due to floor polishing.

Figure 36 Failing grout and sealant joints at perimeter of marble slabs.

Figure 37 Small chips at top of slab (arrows) presumably from picture hangers such as those visible at right of photo.

Wallpaper and Fabric Coverings

The rear face of the storage wall appears to be covered in a variety of materials, including paper, fabric, and gold leaf (Figure 38). (However, it is possible that they are mostly composed of silk fabric; see following paragraph.) A textured wallpaper is also present in the powder room in the northeast quadrant of the house (Figure 39). In the master bedroom, fabric wall coverings are hung behind the bed and in the adjacent office (Figure 40).

The wall coverings are not addressed in Saarinen's specifications because they were selected by Xenia Miller in consultation with Girard. The Newfields archives include records of correspondence between Girard's office and Xenia in 1963, including fabric samples of the very papers still on display within the storage wall.[3] The memo indicates that grey, gold, green, red, and Japanese handblocked papers were being shipped to the Millers. The memo also included samples of beige and gold papers. All of the papers were silk. The memo does not indicate the provenance of the papers, but other correspondence refers to the Kneedler Fauchère company.[4] Additional correspondence documents a struggle to match a particular wallpaper in 1990, perhaps one that had deteriorated by that point.[5] Additional research into archives may yield more information about the wall coverings.

Staining from water infiltration was noted on several of the wallpapers at the south end of the storage wall, and on the master bedroom fabric covering at the northwest corner of the house (Figure 41). It is possible that some of this damage dates to the Millers' occupancy, prompting the search for a matching paper c. 1990. The storage wall papers are lifting in spots at the seams, and there are some localized areas of damage from physical abrasion. The powder room wallpaper is in generally good condition except for heavy soiling around the air vent on the north wall. No other conditions were noted.

[3] 057-066 Ordering papers for Storage Wall, letter from Alexander Girard to Xenia S. Miller (annotated). MHG_Ib_B006_f053_057-066, Indianapolis Museum of Art Archives.
[4] 005-007 Sample of Kneedler-Fauchere wallpaper, letter from Dorothy Ezell to Xenia S. Miller. MHG_Ib_B006_f053_005-007, Indianapolis Museum of Art Archives.
[5] 021-026 TV Room/Den chairs fabric sample, correspondence and notes (annotated). MHG_IVa_B085_F009_021-026, Indianapolis Museum of Art Archives.

Figure 38 Storage wall showing a variety of wallpaper colors and patterns.

Figure 39 Wallpaper in powder room.

Figure 40 Subtly distinct fabric wall coverings in master bedroom (left) and adjacent office (right).

Figure 41 Water staining at storage wall and in master bedroom.

Micarta Laminate

Interior walls not clad in plaster or marble are covered in Micarta, a plastic laminate produced by Westinghouse (Figure 42). Saarinen specified that visible Micarta was to be 1/16" thick "standard grade" applied to plywood, while the unexposed face of any such plywood was to be clad in "back grade" Micarta "to balance stresses."[6] Micarta walls are typically located next to doors (also clad in Micarta); these walls were the most frequent location for light switches and other electrical devices (Figure 43). Micarta was also used for countertops in the kitchen, laundry, bathrooms, and for other built-in furniture around the house.

The house's Micarta features exhibits remarkably little deterioration. No discoloration was noted in areas of sun exposure or at areas in the kitchen exposed to heat. The kitchen countertops have many fine scratches consistent with their use as a work surface, as well as a few small locations of chipped edges (Figure 44). Micarta cabinet doors in the laundry room have small areas of damage near the handles (Figure 45). A few small chips were also noted in the storage wall (Figure 46). A larger area of loss was noted at the bottom of a partition in the master bathroom (Figure 47).

Figure 42 Excerpt from a 1950s Micarta publication for architects and specifiers. *Image source: APT Building Technology Heritage Library.*

Figure 43 Typical Micarta door and wall panel assembly. The wall panels typically house light switches or ductwork, as in the above photo.

[6] Micarta is discussed in specification section 12: Carpentry and Millwork.

Figure 44 Numerous small scratches in Micarta kitchen countertop.

Figure 45 Minor Micarta damage at cabinet door handle in laundry.

Figure 46 Small chips in storage wall Micarta.

Figure 47 Largest loss of Micarta noted, at divider in master bathroom.

Aluminum Components of Window and Door Assemblies

The locations of aluminum door and window assemblies, as well as a summary of Saarinen's specifications for each, are discussed previously under "Exterior."

In contrast to the exterior faces of the aluminum window and door assemblies, the interior faces typically exhibit negligible white surface corrosion deposits. The exception is the sliding doors at the west of the house, which do have such deposits (Figure 48). As at the exterior, the most significant condition is deteriorated sealant throughout the assemblies. BCA did not evaluate the windows and doors for operability.

Figure 48 Isolated location of heavy corrosion deposits at sliding doors west of house. The reason for their concentration at this location is unknown. Note also deteriorated sealant (arrow).

Wood Veneer

The original drawings call for plywood with a Brazilian rosewood "front" to be used at face of the storage wall and for painted plywood to be used for the storage wall cabinet interiors for the pair of walk-in closets in the adult bedroom suite. However, it appears that a veneered plywood was used for both the exterior faces of the storage wall and for the closets (Figure 38; Figure 49). (The veneer of the TV cabinet appears similar to, but slightly distinct from, the other storage wall veneer, possibly indicating an alteration. However, the original drawings do depict folding cabinet doors at this location.) Veneered plywood was also used for other built-in furniture throughout the house. The specifications call for veneered plywood to be faced with benge (*Guibourtia arnoldiana*), a West African genus also known as mutenye, though the veneer does not appear to be consistent throughout the house. Perhaps some of the veneer is rosewood, and some of it benge.

Few veneer conditions were noted. In isolated regions, the veneer has a small loss or has become loose (Figure 50). The veneer in the vicinity of the cabinet handles in the walk-in closets is heavily scratched (Figure 51). Upon close inspection, minor wear was also noted in the vicinity of cabinet handles of the storage wall (Figure 52). The areas around the handles in both locations exhibit grease staining. Isolated scratches were also noted on the wood inside the powder room.

Figure 49 Veneered cabinetry in walk-in closets of master bedroom suite.

Figure 50 Largest loss of veneer, at storage wall door that may contact a steel column when opening.

Figure 51 Heavily scratched veneer near cabinet handles, walk-in closet.

Figure 52 More subtle wear of veneer near cabinet handles, storage wall.

Terrazzo and Travertine Flooring

At the enclosed private spaces at the corners of the house, the terrazzo flooring appears to match that installed at the exterior (Figure 20). (Because the original construction documents call for the exterior paving to be precast concrete, it is not possible to determine from the specifications.) In the primary living area at the center of the house, the flooring appears to be travertine (Figure 53). Saarinen's specifications do not call for travertine, but instead for several different types of marble—for example, different materials were specified for below the storage wall and for the entrance. However, neither the materials nor the differentiation appears to follow the specifications. A hand-written note that was scanned with the original specifications reads "Gray St. Michel / polished finish." BCA was unable to find information about this product, but it may represent the trade name of the travertine ultimately selected for the floors. Saarinen specified that all interior marble joints were to be filled with white portland cement; presumably this was followed for the travertine.

Conditions vary between the two materials. The travertine floor units are cracked in isolated locations, particularly at locations near the perimeter of the house such as the kitchen and dining room (Figure 54). More commonly, the thin grout joints between the units show signs of failure and previous repairs. Upon close inspection, it appears that the original grout remains in some locations. This grout is white and is consistent in appearance with an unsanded white portland cement. At some locations, this early grout is missing or failing (Figure 55). At many other locations, particularly those near the entrance that presumably experience more foot traffic, the grout has been covered or replaced by material that appears to have yellowed with age (Figure 56). This yellowed material is also failing at many locations.

The interior terrazzo floor units are in better condition overall than those units at the exterior. However, several units at the corners of the house are cracked in a manner similar to the exterior units. The most significant such cracking occurs in the Millers' bedroom at the northwest corner of the house (Figure 57). The interior terrazzo appears to use the same plastic joint cover system as the exterior; however, this system has fared much better at the interior. No cracking was noted, nor was there evidence of the metal divider strips rusting. One area of rust was noted below the sink in the children's bedroom suite, but this appeared to be related to adjacent plumbing (Figure 58).

Figure 53 Primary living area featuring travertine floors.

Figure 54 Cracked travertine in dining room.

Figure 55 Suspected original white grout at perimeter of conversation pit. Note the losses.

Figure 56 Yellowed later repair grout, typical.

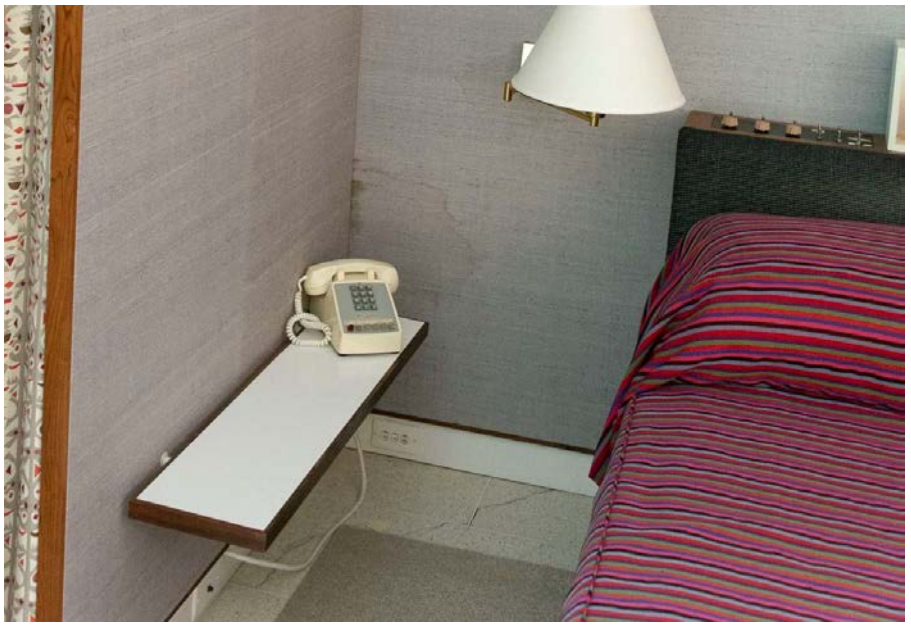


Figure 57 Cracked terrazzo was most significant in the northwest corner of the house.

Figure 58 Iron staining at terrazzo in children's suite bathroom.

Tile Walls and Flooring

Tile is present in several locations (Figure 59). Most locations feature a square, white, ceramic tile on the walls. These locations include the laundry room and all bathrooms. Identical tiles are installed on the floor of the cold storage room. The specifications do not provide additional information, only state that the tiles were to be ceramic. Few deterioration conditions were noted in any of these spaces. However, several tiles are cracked or missing in the cold storage room (Figure 60). Some grout is missing in the cold storage room and showers.

Blue glass mosaic tile is installed on the wall behind the stove in the kitchen (Figure 61). The specifications call for a product called “Vetrotex,” distributed by the Andrew R. Maglia Company of Detroit. The glass tile exhibits no significant deterioration.

Figure 59 Tile flooring in the cold storage room. The same tile is present throughout many bathroom walls.

Figure 60 Cracked floor tile.

Figure 61 Glass mosaic tile in kitchen.

Grouts, Sealants, Etc.

Sealants used at the perimeter of stone cladding are discussed under *Marble Wall Cladding*. Sealants used in the door and window assemblies are discussed under *Aluminum Components of Window and Door Assemblies.* In general, however, all interior sealant within the Miller House is at or near the end of its service life.

Site Features

Glazed Espaliers

There are two glazed steel espaliers (walls for the purpose of controlling the growth of fruit trees), one at the east and one at the north of the house. The glass has a dimpled and is set in two staggered rows (Figure 62). According to drawings produced by Dan Kiley, the walls were intended to support pear trees (Figure 63). Galvanized wire was to be hung across the panels to control the branches; some of this wire is still present at the north set.

The most common condition noted was failure of paint and sealant, sometimes accompanied by corrosion of the substrate (Figure 64). One glazing unit is missing at the north screen wall, reportedly due to the glass's shattering on impact with an object thrown from a lawnmower (Figure 65). There is also significant organic growth on both the metal and glass.

Figure 62 Glazed screen wall at east of house. A similar wall is located at the north of the house.

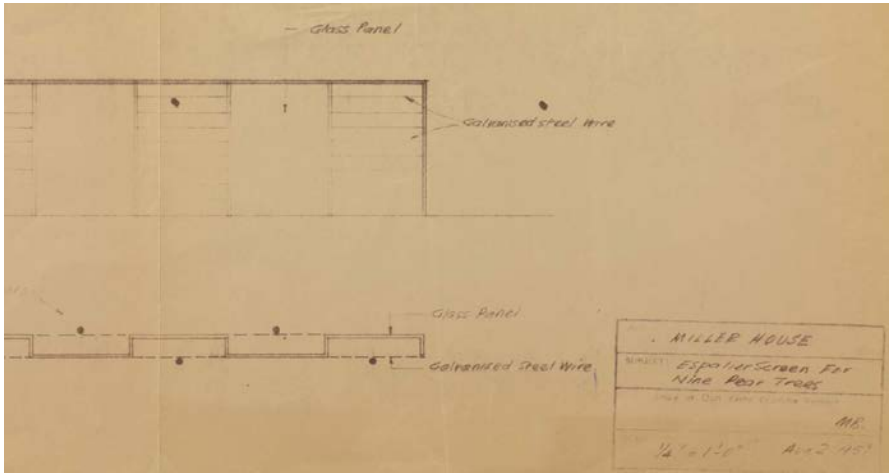


Figure 63 Detail of original drawing showing intended use of screen walls: as espaliers for pear trees.

Figure 64 Paint failure and corrosion at espalier, typical. Note also the failing sealant at glazing (arrow).

Figure 65 Missing glazing at central panel, north espalier. Note the wires for tying the branches of trees.

Pavers

The paved driveway at the east of the house features distinctive gray “Z-lock” cement pavers that the Millers had shipped from Switzerland c. 1973 (Figure 66).[7] Fortunately, the Millers retained attic stock of these pavers, a number of which have required replacement.

Only two conditions were noted. The first is that the replaced units due not visually match the adjacent pavers despite their being the exact same product (Figure 67). This discrepancy appears to be because weathering has eroded the cement binder at the surface of the older pavers, exposing more of the aggregate. With time, the more recently installed units are expected to weather similarly and should eventually blend in better with the adjacent units.

The second condition noted was settlement. Settlement is most evident in two locations: the first, a small region of uneven pavers near the entrance to the house (Figure 68). The second location is a larger region at the eastern edge of the driveway between its front and rear halves (Figure 69). It was suggested that the latter location may be due to wear from tour shuttles. However, the settlement did not perfectly correlate with the path of the shuttles, so other explanations such as subsurface conditions must also be considered.

Figure 66 Distinctive pavers at driveway, east of house.

Figure 67 Recently installed paver. With binder intact, the unit appears mismatched.

[7] 053 Landscaping/grounds report, memo from W. O. Doede to Xenia and J. Irwin Miller (annotated). MHG_Ib_B023_F248_053, Indianapolis Museum of Art Archives.

Figure 68 Isolated region of settlement near carport entrance.

Figure 69 Larger region of settlement at far east of driveway, between front and rear halves. Note curvature of edge and gaps between units.

Iron Gates

Several types of iron gates are present throughout the site. At the south of the house, two ornamental wrought-iron gates, designed by Girard, are present on two sides of the pool area (Figure 70). At the north of the house, an iron gate in a geometric design stands at the end of Highland Way. Modern motorized gates in the same geometric design are installed at the nearby entrance from Washington St. and at the Highland Way entrance at the south of the property.

The paint on the ornamental gates near the pool is beginning to fail, resulting in corrosion of the substrate (Figure 71). This condition is much more extreme at the original geometric gate at the north of Highland Way. Corrosion at this gate has advanced to the point of total loss at several locations, which seem to be primarily welding points (Figure 72). The team did not thoroughly assess the modern gates based on the same design, but no similar deterioration was noted.

Figure 70 One of two ornamental gates near the pool.

Figure 71 Early stages of paint failure at pool gate.

Figure 72 Corrosion to the point of loss at geometric gate, typical.

Stone Platform and Bench

At the north of the allee of trees along the west of the house is a stone platform consisting of thick (approximately 2") Indiana limestone pavers, curbs, and built-in benches. The paving formerly supported a large sculpture (Figure 73). Kiley's drawings originally showed this area as a "north terrace," which would feature a grid of plants. Later, the drawings refer to the platform as the "future Pavilion." BCA was unable to determine whether the planting design was ever executed. By 1973, drawings begin to mention a sculpture. It is therefore possible that the stone platform postdates the construction of the house, but BCA did not identify drawings of the platform. Near the middle of the platform is a bench that appears to be constructed of cast concrete.

The most significant condition noted at the platform was widespread displacement of units (Figure 74). This displacement was most evident at the curb along the edge of the platform (Figure 75). These units were typically rotated away from the main platform, particularly at the west side. All joints between stone units are open, possibly due to soil subsidence and/or the action of roots from nearby trees. Whatever the cause, it is likely that water and other material is washing into the openings and jacking the units even farther apart. In addition to displacement, small cracks and losses were noted in isolated locations (Figure 76). One large crack was noted in the bench (Figure 77). Other conditions are limited to general soiling and organic growth.

Figure 73 Stone platform at north end of allee.

Figure 74 Displaced units, typical.

Figure 75 Photo looking down into large gap between curb and paving units, typical at west of platform.

Figure 76 Crack in stone curb.

Figure 77 Crack in marble bench.

Concrete Pavers, Curb, and Stair

At the south of the allee of trees, a grid of square exposed-aggregate concrete pavers surrounds an ornamental pool (Figure 78). Kiley referred to this area as the South Terrace. The pavers are bordered by a similar concrete curb. Finally, a monumental exposed-aggregate concrete stair, apparently cast in place as one large unit, leads from the pool area down to the lawn to the west (Figure 79).

Very few conditions were noted at these features. Small edge losses were noted at some of the pavers, though they are not particularly visually apparent due to the rough texture of the concrete (Figure 80). Two cracks were observed in the concrete curb (Figure 81). The monumental stair exhibited remarkably little deterioration, with only one small region of losses noted (Figure 82). However, a larger region of previous patching repairs is visually obtrusive as no attempt appears to have been made to match the appearance of the original material (Figure 83).

Figure 78 Pool at south of allee, surrounded by exposed aggregate pavers. Monumental stair is at top right of photo.

Figure 79 Monumental stair leading up from west lawn to pool area.

Figure 80 Small edge losses in concrete pavers.

Figure 81 Cracks in concrete curb.

Figure 82 Small losses in monumental stair (arrow).

Figure 83 Incompatible patches on monumental stair.

Appendix G: New Orleans Charter for the Joint Preservation Of Historic Structures and Artifacts

New Orleans Charter for Preservation of Historic Structures

The New Orleans Charter is the product resulting from the two symposia: *Museums in Historic Buildings* held in Montreal, Quebec (1990) and New Orleans, Louisiana (1991) and co-sponsored by the American Institute for Conservation of Historic and Artistic Works (AIC) and The Association for Preservation Technology International. This Charter has been officially adopted by the Board of Directors of both AIC and APTI.

The New Orleans Charter was subsequently adopted by the National Conference of State Historic Preservation Officers at its Annual Meeting in Washington, D.C. in March, 1992.

In 1992 this Charter was presented by a panel of symposium participants at a half-dozen conferences.
American Institute for Conservation, Buffalo, June 1992
American Association of State and Local History, Miami, Sept 1992
International Council of Museums, Sept 1992
Association for Preservation Technology, Philadelphia, Sept 1992
Joint meeting of the Mid-Atlantic Association of Museums/New England Museum Association, Albany, Nov 1992
—APT Communiqué 21(2): May 1992

The New Orleans Charter

Arising from a concern for the coexistence of historic structures and the artifacts housed within them;

Recognizing our responsibility as stewards to provide the highest levels of care for the structures and other artifacts placed in our care;

Recognizing that many significant structures are used to house, display and interpret artifacts;

Recognizing that historic structures and the contents placed within them deserve equal consideration in planning for their care;

Recognizing that technologies and approaches will continue to change; and

Recognizing that those involved in preservation are part of a continuum, and are neither the first nor the last to affect the preservation of historic structures and artifacts;

We, therefore, adopt these principles as governing the preservation of historic structures and the artifacts housed in them:

1. Institutions' statements of mission should recognize the need to preserve the unique character of both the historic structure and artifacts.
2. The preservation needs of the historic structure and of the artifacts should be defined only after study adequate to serve as the foundation for the preservation of both.
3. Requisite levels of care should be established through the interdisciplinary collaboration of all qualified professionals with potential to contribute.
4. Appropriate preservation must reflect application of recognized preservation practices, including assessment of risk before and after intervention, and the expectation of future intervention.
5. Measures which promote the preservation of either the historic structure or the artifacts, at the expense of the other, should not be considered.
6. Regarding public use, the right of future generations to access and enjoyment must outweigh immediate needs.
7. Appropriate preservation strategies should be guided by the specific needs and characteristics of the historic structure and artifacts.
8. Appropriate documentation of all stages of a project is essential, and should be readily accessible and preserved for the future.
9. The most appropriate action in a particular case is one which attains the desired goal with the least intervention to the historic structure and the artifacts.
10. Proposed preservation strategies should be appropriate to the ability of the institution to implement and maintain them.

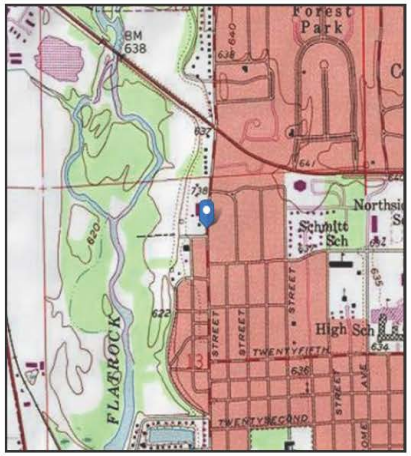
Appendix H: ASCE 7 Hazard Report

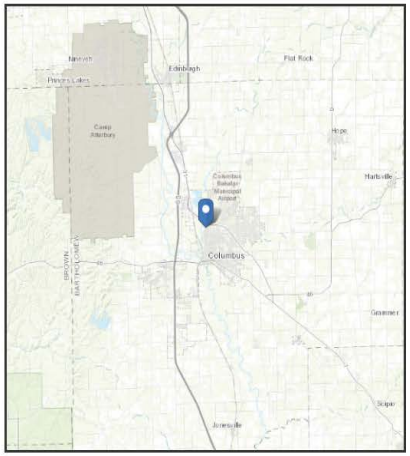
ASCE 7 Hazards Report

Address:
2860 Washington St
Columbus, Indiana
47201

Standard: ASCE/SEI 7-16
Risk Category: III
Soil Class: F - Site Response Analysis

Elevation: 636.9 ft (NAVD 88)
Latitude: 39.227959
Longitude: -85.92173





Wind

Results:

Wind Speed:	113 Vmph
10-year MRI	74 Vmph
25-year MRI	81 Vmph
50-year MRI	93 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1C and Figs. CC.2-1–CC.2-4
Date Accessed: Thu Feb 07 2019

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Seismic

Site Soil Class: F - Site Response Analysis

Results:

A site response analysis shall be performed in accordance with ASCE/SEI 7-16 Section 21.1 for structures on Site Class F sites. If your structure is exempted under ASCE/SEI 7-16 Section 20.3.1, select a substitute site class.

Data Source: USGS Seismic Design Maps
Date Accessed: Thu Feb 07 2019

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	5 F
Gust Speed:	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Feb 07 2019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Snow

Results:

Ground Snow Load, p_g:	20 lb/ft^2
Elevation:	636.9 ft
Data Source:	ASCE/SEI 7-16, Table 7.2-8
Date Accessed:	Thu Feb 07 2019

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

Rain

Results:

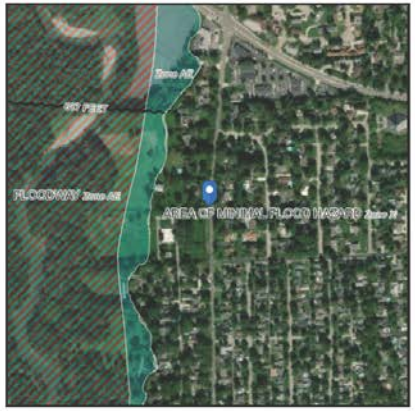
15-minute Precipitation Intensity:	6.22 in./h
60-minute Precipitation Intensity:	3 in./h
Data Source:	NOAA National Weather Service, Precipitation Frequency Data Server, Atlas 14 (https://www.nws.noaa.gov/oh/hdsc/)
Date Accessed:	Thu Feb 07 2019

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Flood

Results:

Flood Zone Categorization:	X (unshaded)
Base Flood Elevation:	Refer to map for local elevations and interpolate according to the Authority Having Jurisdiction.
Data Source:	FEMA National Flood Hazard Layer - Effective Flood Hazard Layer for US, where modernized (https://msc.fema.gov/portal/search)
Date Accessed:	Thu Feb 07 2019
FIRM Panel:	If available, download FIRM panel here
Insurance Study Note:	Download FEMA Flood Insurance Study for this area here



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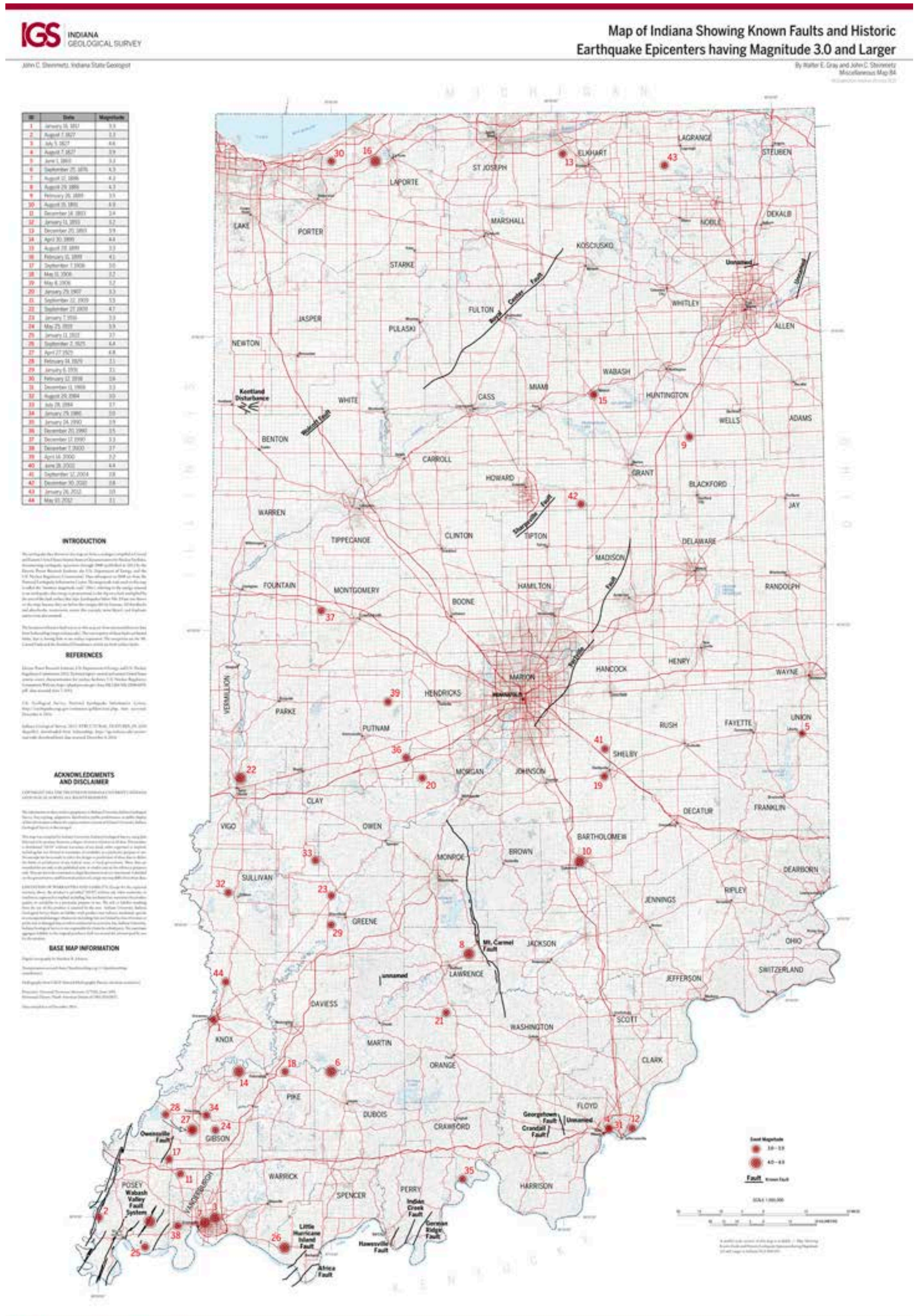
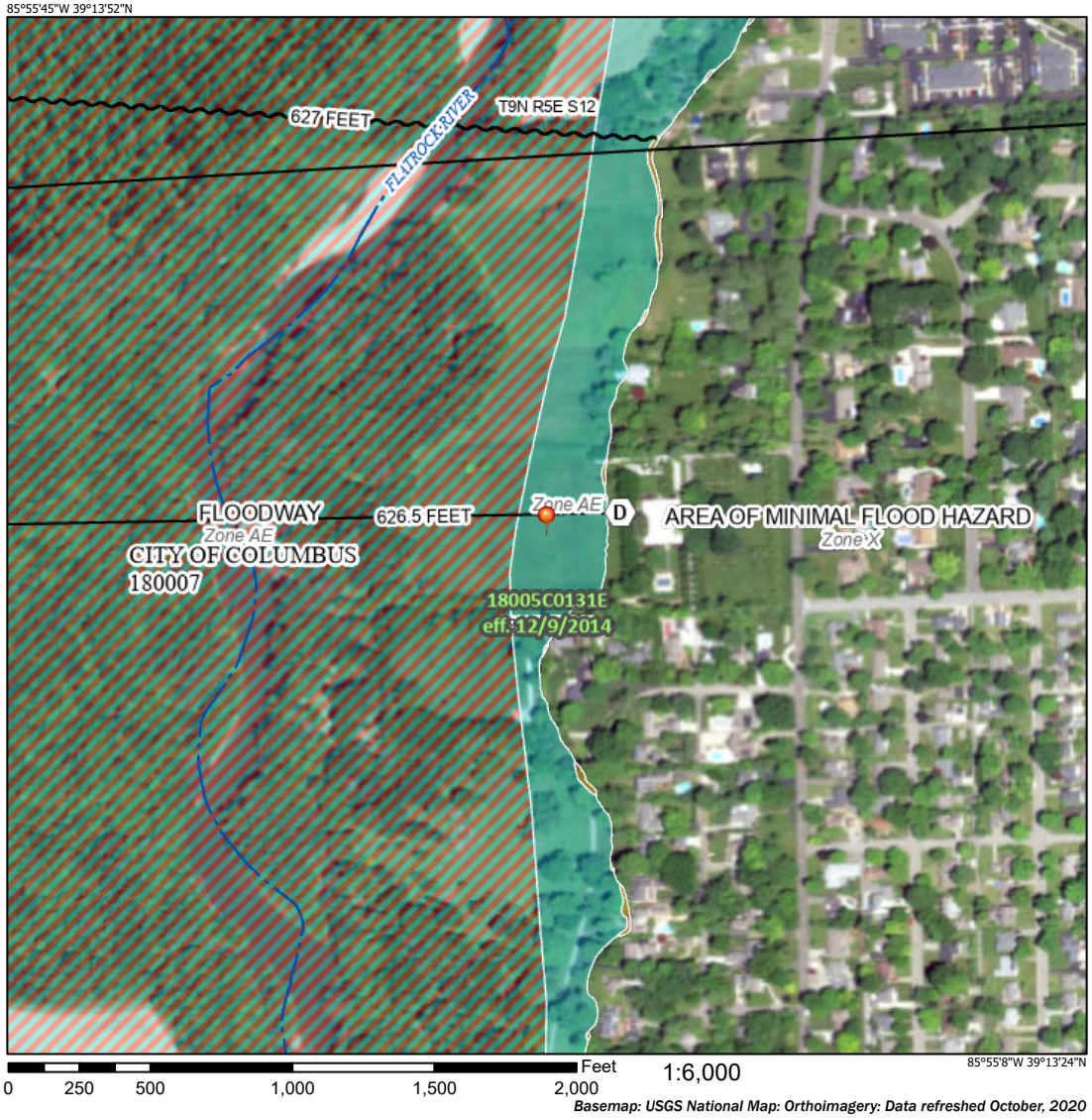
Appendix I: Indiana Geological and Water Survey Map


IGS INDIANA GEOLOGICAL SURVEY
Map of Indiana Showing Known Faults and Historic
Earthquake Epicenters having Magnitude 3.0 and Larger
INTRODUCTION
REFERENCES
ACKNOWLEDGMENTS AND DISCLAIMER
BASE MAP INFORMATION
LAKE
PORTER
LAPORTE
ST JOSEPH
ELKHART
LAGRANGE
STEUBEN
NOBLE
DEKALB
MARSHALL
KOSCIUSKO
STARKE
JASPER
NEWTON
PULASKI
FULTON
WHITLEY
ALLEN
WABASH
MIAMI
CASS
WHITE
BENTON
CARROLL
HUNTINGTON
WELLS
ADAMS
GRANT
BLACKFORD
JAY
HOWARD
TIPTON
WARREN
TIPPECANOE
CLINTON
MADISON
DELAWARE
RANDOLPH
FOUNTAIN
MONTGOMERY
BOONE
HAMILTON
HENRY
HANCOCK
WAYNE
VERMILLION
PARKE
HENDRICKS
MARION
PUTNAM
RUSH
FAYETTE
UNION
SHELBY
MORGAN
JOHNSON
VIGO
CLAY
OWEN
DECATUR
FRANKLIN
BARTHOLOMEW
MONROE
BROWN
SULLIVAN
GREENE
DEARBORN
RIPLEY
JENNINGS
JACKSON
OHIO
LAWRENCE
SWITZERLAND
JEFFERSON
DAVIESS
KNOX
WASHINGTON
SCOTT
MARTIN
ORANGE
CLARK
PIKE
GIBSON
DUBOIS
CRAWFORD
FLOYD
WARRICK
HARRISON
POSEY
SPENCER
PERRY
Mt. Carmel Fault
Kentland Disturbance

Appendix J: FEMA Flood Insurance FIRMette

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/29/2022 at 3:17 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix K: Annual Maintenance List

Annual Maintenance List for Miller House and Garden

HOUSE:

HVAC
-Filter replacement (paper and HEPA)
-Belt inspection and replacement
-Controls inspection and monitoring
-Chiller maintenance and cleaning
-Boiler inspection

Painting
-Exterior scraping, sanding, and painting (weather permitting, generally summer and fall)
-Interior painting (generally winter, as needed)

Electrical
-as needed

Plumbing
-as needed

Roof
-Monthly cleaning
-Quarterly inspection and repair

Skylights
-Annual whitewash
-Quarterly inspection
-Annual cleaning of lay-light glass

Terrazzo
-Cleaning, as needed

Windows
-Exterior cleaning, monthly

Housekeeping
-Dusting
-Mopping
-Interior window cleaning
-Polishing (brass, aluminum, etc.)

Marble
-cleaning as needed

Slate
-cleaning as needed

COLLECTIONS:
Light Sensitivity
- Rotate pillows in Conversation Pit, summer and winter sets – Twice a year
- Cover exposed textile at entrance and Eames Chair in Den – Daily
- Keep curtains closed when not open to public – Daily
- Keeps lights off when not touring or occupied by staff – Daily

Inventory
- Check inventory of displayed objects – Daily

Conservation/Cleaning
- Dust and clean furniture and built in surfaces – Daily/as needed
- Conservation of damaged/tarnished objects – As needed
- Take environmental readings and load into eClimateNotebook – Quarterly
- Cleaning and bulb replacement on Venini chandelier above Dining Room table – Annually
- Refresh of dust covers in Barn storage – Annually
- Rehousing for objects – on going
- Carpet cleaning – Annually
- Piano Tuning – As needed

GARDEN:

Spring cleanup
Aeration
Spring fertilizer
Edging
Mulching
Pre-emergent in beds
Mowing
String-trimming
Tulip planting/removal
Annual plantings
Open irrigation
Irrigation repair
Herbicide spraying
Rake Allee
Open/close fountains
Open/close pool
Sheer Taxus
Sheer Arborvitae
Clean pool
Fall cleanup
Pollarding of apple and crabapple trees
Thinning of oaks and beech trees
Snow removal
Equipment maintenance

Appendix L: Newfields Historic Preservation Policy

NEWFIELDS

Historic Preservation Policy

Newfields
Historic Preservation Policy
9/18/2017

TABLE OF CONTENTS

I. PHILOSOPHY AND MISSION STATEMENT

Newfields owns and maintains three historic sites:

- Oldfields-Lilly House and Gardens
- Westerley House and Garden
- Miller House and Garden

These sites possess intrinsic historic value due to the well-known families who built and lived in them and the prominent architects, artists, and designers involved in their creation. Oldfields and Miller House are designated as National Historic Landmarks and Westerley is located within a district on the Register of Historic Places.

Newfields relies on these sites to help fulfill its mission to "enrich lives through exceptional experiences with art and nature."

The purpose of this Historic Preservation Policy is to guide priorities and decisions about these historic properties so they may continue to support this mission.

Historic sites have played an integral role in Newfields development since 1970, when the Indianapolis Museum of Art moved to its current site. Donated to the Arts Association of Indianapolis by the Lilly family in 1967, the site was once home to the Landons and the Lillys, two important Indianapolis families that shaped their local communities and influenced the world we live in today. The site also includes the land that surrounded them. Once known as the town of Woodstock, it was founded as a community of country residences in the early twentieth century.

Since the move in 1970, Newfields' focus has expanded to include architecture and landscape as well as culture and art. The symbiotic relationship between Newfields and the Oldfields Estate laid the foundation for the acquisitions of Westerley in 2001 and the Miller House in 2009.

Newfields is mindful of its legacy as a cultural landscape and living museum. Newfields understands that preserving and promoting that legacy is directly dependent on the quality and care that it tenders to its physical shape and appearance, including the physical character of its historic buildings and landscapes. Changing certain characteristics of the physical environment diminishes the historic integrity of these properties. Newfields' stewardship will insure that these properties continue to reinforce its connection to the community. In providing this stewardship, Newfields will follow *The Secretary of the Interior's Standards for the Treatment of Historic Properties*[1] and the *Guidelines for the Treatment of Cultural Landscapes*[2]. The degree of

[1] Standards can be found at https://www.nps.gov/tps/standards.htm referenced on 9/13/2017

[2] Guidelines can be found at https://www.nps.gov/tps/standards/four-treatments/landscape-guidelines/ referenced on 9/13/2017

architectural and landscape integrity found in the broad range of historic assets at Newfields varies. Newfields will make every attempt to maintain the highest level of integrity and will prioritize future work by applying a tiered ranking to each property.

This preservation policy describes the significant features of each site, detailing the material characteristics that contribute to their significance, and then providing guidelines and strategies for their use and care. Newfields recognizes that these sites are dynamic places and that the people and circumstances surrounding these sites are always changing. With this policy it is our hope that we maintain these sites to a high professional standard and provide service to our guests at the level of excellence our community has come to expect, while remaining relevant to a modern audience.

II. GOVERNING AUTHORITY

A1. The final authority for acquisition or removal of historic properties rests with the Newfields' Board of Governors upon recommendation of the Buildings and Grounds Committee.

A2. All renovation, rehabilitation, and intended uses are approved by the Horticulture and Natural Resources and Buildings and Grounds Committees.

A3. The Horticulture and Natural Resources Committee oversees programmatic use of natural resources and the horticultural collecting policies (See *Appendix A* for HNRC Committee Charter).

A4. The Buildings and Grounds Committee oversees all capital assets and budget allocations related to the historic properties and features (See *Appendix B* for BGC Committee Charter).

A5. These guidelines will be reviewed every five years and may be revised when deemed necessary by the two committees based upon recommendations from the staff. Under normal circumstances, revisions will be brought to the attention of the two committees for approval at their regular meetings. If exceptional circumstances arise or situations occur which are not covered in this policy, the Director, in consultation with the Chairman of the Board of Governors, may take action deemed appropriate.

III. STATEMENT OF SIGNIFICANCE

Each historic site held by Newfields is diverse and complex, and so each is described below in its own section in order of its significance; each section is then further divided based on the site's individual parts and contributing features. While these descriptions are not all-encompassing, they highlight the character-defining elements of each site.

Character defining elements refer to visual aspects and physical features that comprise the appearance of each building or landscape. These elements may include the overall shape of the building, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment.

A. Miller House and Garden

The Miller House and Garden site is considered to be a masterwork of each designer involved in the project. The architecture firm Eero Saarinen and Associates was responsible for the design of the main house and greenhouse. Alexander Girard oversaw the interior design of the buildings, providing everything from the patterns on the carpet to sources for furniture and art. Girard's relationship with the Millers continued throughout his life. Dan Kiley designed the modernist garden that surrounds the house. The estate was a true collaboration among designers, with themes repeated in the design of the house, the furnishings and the garden. The house and garden underwent few changes, all of which involved consultation from their respective designer or the designer's representative, keeping in mind the original design intent. The importance of this site comes from this holistic modernist design aesthetic.

The Miller House and Garden is a 20-acre estate in Columbus, Indiana.

Designed by Dan Kiley, the 14.5-acre garden joins an additional 5.5 acres southwest of the meadow. The original 14.5 acres were purchased by Irwin and Xenia Miller in the early 1950s. Eero Saarinen was commissioned to design the home by the Miller family in 1953 and completed the project in 1957. The 5.5 acre addition was purchased by the Millers a few years after the house was completed. The house, its interior and garden are in the modernist style. The Miller House was designated a National Historic Landmark and listed on the National Register of Historic Places while the original owners lived in the house and while landscape architect Dan Kiley was still living, a first for a site with this designation.

Two buildings, a barn and house, on the 5.5-acre property existed when the Millers purchased the property. These were used by the Millers as support for the estate and to provide housing for staff. Though not directly part of the designed Miller House, they have significance because of their role in the continued maintenance and history of the

property as well as the link they provide between an often venerated space and the dynamic world in which it was built.

The IMA opened the house to the public for tours in 2010. Since then, the Miller House and Garden has provided a unique experience for visitors, allowing them to tour a site that encompasses the idea of modernist design as manifested in the work of three renowned designers. Due to preservation efforts by the Miller family and the IMA, guests experience the original intent of the designers involved in the Miller House and Garden's design.

1. Miller House

Eero Saarinen and Alexander Girard are both listed as architects on the blueprints for the Miller House, with Saarinen as principal architect. Taylor Brothers of Columbus, Indiana built the home.

Character-Defining Elements

- Rectangle with 9 grid pattern construction
- Flat roof with large overhang and skylight system throughout
- Exposed structural beams
- Natural slate exterior walls and marble interior walls
- Terrazzo and travertine floors
- Floor-to-ceiling glass panels for windows and doors
- Conversation pit
- Storage walls
- Built-in tulip dining table
- Carport
- Circular fireplace

Integrity

Very few changes were made to the interior of the Miller House. The maid's quarters were remodeled between 1974 and 1978 under the supervision of Girard. The powder room wallpaper was also added, again with consultation from Girard. Other than that, the only cosmetic changes made were additional support bars and a handicap-accessible tub added to the girls' bathroom and a handrail, designed by Kevin Roche, installed in the conversation pit. These items were added as the Millers' needs changed.

Various utility systems have been improved, such as electrical and HVAC. LED lights were added throughout the house in 2017.

2. Greenhouse

The greenhouse/private office is also located on the original 14.5 acre property. Originally designed by Saarinen as a greenhouse and storage space, the block building was remodeled in 1962 by Girard as a private office space for J. Irwin Miller, who requested a kitchenette, storage wall, desk, and fireplace to be included. The original greenhouse extension was removed at this time. Taylor Brothers completed this work for $70,000.

Character-Defining Elements

- Flat roof
- Storage wall
- Wood paneling and built-in desk
- Floor-to-ceiling windows
- Carpeted floors and ceilings

Integrity
This space was restored by the IMA in 2014. The only change was the replacement of carpet due to a plumbing leak that occurred shortly after the IMA took possession of the property.

3. Pool

The pool was added to the Miller House in 1963. When the pool was added, Girard designed gates at the north, south, and west sides of the pool, which were inserted within the arborvitae privacy hedge. The mechanical area is located to the south of the pool in an underground space.

Character-Defining Elements

- Girard-designed gates
- Arborvitae privacy hedge around perimeter

Integrity
The pool is not in use and has been minimally maintained and covered since the property transferred to the IMA for liability reasons. The diving board has been removed. All sculptures were removed from the area before ownership was transferred to the IMA.

4. North and South Apple Orchards

The apple orchards are an important component in the Miller House Garden. They are located in front of the house on the east side of the property.

Character-Defining Elements

- Contains 80 apple trees, 40 per side
- Organized in geometric pattern

- Privacy hedge of arborvitae in a geometric pattern facing Washington Street.

Integrity
The orchards have been maintained and new plants have been added to replace damaged or diseased trees over time. The arborvitae hedge has become overgrown in some locations and plants with multiple trunks have begun to splay open. The hedge has been reinforced with wire to maintain the upright habit.

5. Crabapple Grove

The crabapple grove, sometimes referred to as the adult garden, is on the north side of the property. This garden space is above an irrigation pit that houses the pump for many of the irrigation zones on the property.

Character-Defining Elements

- Grid-type planting design with small flowering trees under planted with annual beds, hides irrigation pit
- Limestone pavers
- 2nd-century Roman basin with Girard-designed fountain head
- Steel and glass privacy screen and laundry line

Integrity
Originally home to a grove of 36 redbud trees, this space was replanted in 1985 after the decline of the original trees. Since there were not suitable replacement redbuds available at the time, a multi-stem crabapple was chosen as the replacement. There is also a steel and Kokomo glass privacy screen that once doubled as drying racks for laundry. The privacy screen now hides a conventional clothesline. The fountainhead was restored in 2014.

6. Honey Locust Allée

One of the most iconic spaces in the garden is the allée west of the house bordered by 34 honey locust trees. Originally designed as a loggia dividing the main garden spaces from the meadow, the space assumed the role of a traditional allée when Henry Moore and Jacques Lipchitz sculptures were added at either end. At the south end of the allée there is another garden designed in a grid pattern that includes a water feature.

Character-Defining Elements

- Honey locust trees planted in parallel lines
- Crushed stone ground treatment

Integrity
The allée has been replanted three times since 1957, each time with the original genus/species. The first allée failed due to a change in the soil pH created by the use of

limestone on the path. For the next two plantings, limestone was replaced with crushed granite. The second attempt planted the trees too deeply, and they survived for only a few decades. After some research, the third planting included new stone and the appropriate planting depth. The sculptures were removed before the property was transferred to the Indianapolis Museum of Art.

7. Horse Chestnut Allée

The private entrance to the house, or horse chestnut allée, starts at the south entrance of the property and continues to the south side of the house.

Character-Defining Elements

- Trees planted in parallel lines on both sides of the drive
- Trees divided by low clipped hedge

Integrity

After years of treatment for blight, the horse chestnut trees continued to decline. The Indianapolis Museum of Art decided to replace the horse chestnuts with yellow buckeye trees, which have similar leaf structure to horse chestnuts and share the same genus. The yellow buckeye is native to the Ohio River Valley and is not susceptible to the blight that damaged the horse chestnuts. The trees were originally divided by arborvitae (Thuja), but this was later changed to a yew (Taxus) hedge.

8. Meadow

The meadow is a 7-acre area of turf that also acts as a flood plain for the property. The main garden area surrounding the house including the honey locust allée sits above the meadow and descends south towards the Flatrock River.

Character-Defining Elements

- Position below grade of house and main garden area
- Line of red maple trees to the south
- Two groupings of weeping willow
- One grouping of red maples at northwest corner of property

Integrity

No known changes have been made.

B. Oldfields Estate

Oldfields Estate, a 26-acre estate that was home to both the Landon and Lilly families, is a key component of the Garden at the IMA.

The estate comprises one half of a 52-acre plot purchased by Hugh McKennan Landon and Linneas Comer Boyd in 1907 to develop the Town of Woodstock. Between 1909 and 1913, Landon built the main house as his residence, along with all outbuildings except two. The estate was purchased by Josiah Kirby Lilly, Jr., in 1932. The Lilly family oversaw major renovations and a series of redecorating efforts to the main house as well as construction of the Recreation Building, now known as Garden Terrace, and Newfield House.

With the exception of the Formal Garden, which already existed, Percival Gallagher of the landscape architecture firm Olmsted Brothers designed the gardens and grounds, which act as the foundation elements of the Garden at Newfields. Today, the elements of Oldfields' landscape designed during the early twentieth century retain a high degree of historical integrity, completing the setting for the house and enhancing Newfields visitors' understanding of the American country estate.

The significance of Oldfields as a country estate comes from the combination of prominent people involved in the creation of the estate over time and from the many parts that create the entirety of this largely intact historical site. Unlike a stand-alone house, the estate's horticultural facilities, worker housing, various types of gardens and landscapes, bridges, gates, water features, and sculptures combine with the residence to create a whole that is much more valuable than its parts. The loss of any one element would diminish its power of place and historical significance.

Below are the significant physical features of the individual buildings, structures, gardens, and landscapes. When known, artists, designers, and architects who were involved with these sites are also noted, since they deepen the significance and broaden the connection of the estate to the larger cultural landscape.

1. Lilly House

The main house, now known as the Lilly House, was designed in the style of French Renaissance Revival for the Landon family by architect and engineer Lewis Ketcham Davis. The house was built by Brandt Brothers Construction Company between 1909 and 1913.

Character-Defining Elements

- Stucco façade with dentil molding, coffered eaves, and ionic pilasters
- Vermont slate-hipped roof with copper gutters and downspouts
- Dormers
- Iron and glass front door and surround
- Prominent French doors and transom windows
- Hardwood floors, trim, and molding

- Plaster murals in loggia
- Spiral staircase
- Turf terrace with partial stone patio and balustrade

Integrity
The interiors have been changed throughout the history of the house to satisfy the differing tastes of the families and trends over the decades. The most recent interpretation has focused on the Lilly family era during the 1940s and 1950s, though some Landon-era

features have been returned, such as the billiard room, now used as a guest entrance and retail space. Architectural changes and differences in furnishings and wall treatments have been detailed in Carolyn Schleif's *Oldfields: An Historic Structures Report* [sic] and *Oldfields* by Bradley C. Brooks.

The most dramatic changes were made by the Lilly family during the 1944 renovations. At this time the front door and main staircase were moved, the sunroom at the south end was converted into a library and extended, the orientation of dormers was changed, windows were replaced, the third floor staircase was reoriented, and the first floor doors and windows were moved. Several mantels were also moved to different rooms. Over the years the Lillys also implemented many mechanical upgrades, including the installation of forced air heating and a whole-house radio system. A full list of documented changes is maintained and continues to be updated with changes made by the IMA.

During the Lilly era renovation, all six-over-one double-hung windows on the second and third floors were replaced with steel casement windows. A few of the original double-hung windows still remain on the basement level, though various windows and doors have been blocked due to mechanical upgrades or security control.

In 2001 the Indianapolis Museum of Art completed a major renovation of the house, adding new mechanical systems and reinterpreting the house with much cosmetic refinement. During this renovation, the south half of the terrace was excavated to make room for modern restrooms and an orientation theater in the basement; these are the only spaces added to the house by the IMA.

A few additional changes made by the IMA alter the physical structure and layout of the house: Security, alarms, mechanical upgrades, electrical utilities, and fire suppression equipment have been added or upgraded to comply with code and the conversion into a public building. To comply with ADA regulations, a portion of the second floor had to be altered, and the height of the second floor elevator stop had to be changed to eliminate

stairs and provide wheelchair accessibility. In addition, many of the second floor bathroom fixtures were removed.

2. Greenhouse

Greenhouses were common features in many country estates, and Oldfields was no exception; its typical Victorian-style greenhouse was built at the same time as the main house. It provided flowers and produce as well as a place for starting plants for the gardens and wintering plants. Both the Landon and Lilly families modified and used the greenhouse, demonstrating its importance to the workings of a country estate.

Character-Defining Elements

- Multi-house construction with central atrium
- Gothic style window design
- Curved Lord and Burnham glass
- Attached potting shed/head house
- Cold frames on southern wall

Integrity
The Landon family built the original greenhouse, and alterations were probably made to the structure while Percival Gallagher worked on the property in the 1920s. The Lilly family replaced the aging greenhouse and added to the structure in the 1940s. They built an addition in the 1960s, evidenced by a Lord and Burnham plaque found on the door. Further research is needed to determine construction dates and past designs of the greenhouse during the operating years under the Landons and Lillys. Photographs taken during the 1920s provide evidence of how the houses have changed. They show flat-paned glass corners on the houses where curved panes exist today. A taller center house can also be seen as well as a tall brick chimney stack that no longer exists.

To the east of the greenhouse was a large flower and vegetable production garden surrounded by a hedge. A hedge still exists in this location, though the garden has been replaced by a large asphalt parking lot to service the retail shop. The family would have adapted this area on a seasonal basis to support the needs of the estate. This garden was replaced with an asphalt parking lot in the early 1970s.

The current head house or potting shed was constructed in 1994-95 to function as a retail space and office by the IMA; it is situated on top of the original walkout basement space.

The IMA restored the existing greenhouses in the 1970s. In 2007 the IMA rehabilitated the greenhouses and upgraded to the mechanical systems. A new boiler was installed in 2016.

3. Root Cellar

Built during the original construction of the estate by the Landons, the root cellar is a subterranean, reinforced-concrete structure with a dirt floor built into the hillside behind the greenhouse. This utilitarian structure serviced the horticulture needs of the entire estate. The design of the layout and technology of the structure are integral to its success and use.

Character-Defining Elements

- Subterranean construction
- Anteroom with door lock
- Exterior air vents at ceiling and floor
- Floor-to-ceiling shelves around perimeter

Integrity

The interior lighting system in the main room has been upgraded with galvanized conduit. The original light in the anteroom is missing. There are hinges outside the exterior double doors indicating another set of doors was once in place, possibly screen or storm doors. It is unknown if the one motor vent is original.

4. Garden Terrace and Pump House

The Recreation Building, now referred to as Garden Terrace, was added to the estate by the Lilly family in 1940. The two-story structure was designed by Fredrick Wallick, the same architect who remodeled the main house. Built for recreation and entertainment, this building included a kitchen, main hall, locker rooms, and indoor and outdoor pools, and a tennis court to the East.

The small pump house to the north of the building provides access to the sub-basement mechanical spaces used to service the pools. Its construction and exterior finishing mirrors that of the main structure.

Character-Defining Elements

- French doors and Juliet balconies on upper floor
- Barrel-vaulted ceiling in main room
- Hipped slate roof with copper gutters and downspouts recessed into brick facade
- Curved limestone exterior stairs with iron railings
- bi-level construction

Integrity

Various changes have been made to the recreation complex to accommodate various uses, most notably its use as a restaurant in the 1980s and 1990s. The indoor and outdoor pools were covered and filled in to limit liability, and the locker rooms and tennis court were

removed by the IMA after it was given the property. The kitchen was upgraded during the period when the building served as a restaurant.

The current ceiling of the main room is a barrel arch composed of ceiling tiles and was likely inserted by the IMA after it received the building; research is needed to confirm the original material of this vaulted ceiling, though it was most likely plaster.

The IMA built an addition on the east end of the building in the 1990's. This new entrance provided ADA access for the restaurant and facilitated the building's use as an event space. An atrium was added as well as an elevator, drinking fountains, and modern bathrooms.

5. "Double"

The "Double," located in the service area of Oldfields, is the first building off of Woodstock Drive. The building is part of the original Landon-era building complex completed in 1913 and was presumably designed by Lewis Ketcham Davis. It is a two-family house, mirroring itself in floor plan. This house was most likely built for the grounds staff and their families.

Character Defining Elements

- Duplex design
- Craftsman style
- Stucco and half-timber façade (now covered)
- Exposed rafter tails
- Double hung windows

Integrity

The two-story building has a brick foundation, wood siding on the first level, and a top constructed of plaster and beam, giving it an English Tudor feel contrasted with the French design of the main house. The roof is a modern asphalt shingle. There is a double porch on the front that has been screened in.

The majority of, if not all, original wood windows and doors remain, though some changes have been made for security purposes. Since acquiring the estate, the IMA has mainly used this building as a residence or office space for the horticulture staff. Little professional study or evaluation has been given to the house. Repairs have been made out of necessity often in a patchwork, unstructured approach.

The interiors have been treated differently from one side to the other. Kitchen appliances have been updated for staff use. Light fixtures have been replaced. Vinyl siding has been added to the entire structure, hiding the original surface. A full structural and preservation evaluation is needed.

6. Barn

The barn sits just to the north of the "Double" and is the largest structure in the service area of the estate. On a working estate, the barn, along with the greenhouse, would have been at the center of all activity. Both equipment and animals were kept in this barn. A hennery was once located between the east side of the barn and the wall along Michigan Road.

Character Defining Elements:

- U-shaped layout
- Stucco and half-timber façade (now covered)
- Exposed rafter tails
- Walled courtyard
- Double cupola
- Craftsman style

Integrity

Similar to the "Double" in design, the barn is built on a brick foundation and finished with wood siding, with beam and plaster in the gables. It is assumed to have been designed by Davis. It is a symmetrical U-shaped structure with an original loft door above a large, replaced double door at its center. Two wings come off the ends towards the south to create a courtyard, with the rest of the courtyard enclosed by a brick wall. Two cupolas, one at each end of the main section, were once topped with weather vanes.

There are no known interior photographs of the structure. It is obvious many changes and additions to the interior have occurred, but with no documentation a full report is needed before any major action is taken.

Exterior photos provide the best historical knowledge of this structure. As a utility structure, it has undergone many changes throughout its history, including the rearrangement and replacement of the barn doors with modern overhead doors or double metal doors. The wood siding has been covered with vinyl, and the loft has been converted to office space. There is little consistency among the windows, some having been replaced with modern vinyl windows while others remain original to the structure. A cinderblock chemical storage area with ventilation has been added to the north side of the barn. The roofline is continuous, though it does not appear original to the barn. As with the interiors, changes have been made as required based on functionality and need with little consideration to historic integrity or preservation.

7. Chauffeur's Cottage

The Chauffeur's Cottage dates to the Landon Era, but little is known about its construction. There are no known historical photographs of the structure. This purpose built house for

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the chauffeur along with the three-car garage at the main house shows the importance of automobile transport to the Landon family. This house, along with the other outbuildings, enriches the understanding of estate life.

Character Defining Elements

- Single story Craftsman-style construction with wood siding
- Double hung windows
- Gabled roof
- Covered front and back porches
- Walkout basement

Integrity

The building is a one-story structure, with a walkout basement door on the west side, which sits on a slope leading down to the canal. It is built on a brick foundation with wood siding and an asphalt roof. The doors to the house are on the east and west sides, both with covered porches. The porch to the west is elevated with stair access as is it on the hill side of the house. The single-pane, double-hung windows appear to be original to the house.

There is little evidence that much change has taken place to the exterior of the house besides gutter and roof replacement. The interior maintains many of the original details, doors, and hardware. Modern floor treatments such as wall-to-wall-carpet and vinyl flooring have been added as well as modern appliances in the kitchen. Carpet and carpet pad was removed throughout the house in spring of 2017.

8. Pump House at Canal

The Pump House, original to the Landon era, sits along the canal within the hillside below the greenhouse. It is assumed that this building was also designed by Davis and built at the same time as the other buildings on the estate. It houses all the pumps and mechanical equipment providing water to the estate. The structure differs from all others in its aesthetic and construction. Its naturalistic design was consistent with the surrounding Vernacular Garden area that once existed along the canal. The Vernacular Garden included a cobblestone bird bath and natural log bridge. Only the pump house and bird bath survive today, though the bird bath is no longer in place.

Character Defining Elements

- In-hill construction

- Cobblestone foundation
- Hipped roof

Integrity

The house is constructed along a short concrete retaining wall and slab foundation set into the hillside. The lower half of the structure is constructed of cobblestone, with wood siding

making up the upper portion. The hipped roof, with asphalt shingles and no gutters or downspouts, meets the hill on the back side. All windows are filled with painted plywood. The door is set back from the front façade of the building and contains barred windows in the upper portion.

The few photos we have of the surrounding garden do not show this structure, so little can be said about the possible changes. One can assume glass windows once filled the spaces now covered with plywood. A small portico-type structure is built off the east side, providing cover to external pipes.

9. Michigan Road Wall and Gate Entrances

The Michigan Road wall and gates were built in 1923-24 as part of the larger Olmstead estate plan, becoming the formal entry into the estate. There is a secondary entrance further north along the wall between the "Double" and the barn. The brick wall lined the perimeter of the property, with the gate acting as the main entrance to Woodstock Drive. The drive continued over the Interurban Bridge, past the greenhouse and main house, exiting the estate through the gate at the Woodstock Bridge and curving through the adjacent lots of Woodstock to end at Maple Road, now 38th street.

The wall is made of brick, with recessed curves to meet the limestone piers at the entrance. The piers are decorated with carved wreaths and topped with urn finials. The iron gate was added in 1924. Designed by Fermor S. Cannon, a prominent local architect, the ornate gate features scrolling ironwork, topped with a stylized pineapple and gold shield. The gate is set in away from the road with shrubs and low evergreens planted along the curving section of the wall. These plantings help to define the entrance, allowing the gardens inside to spill out of the gate and welcome anyone passing through. This is the first element from Gallagher's design one would see when entering the estate.

Character Defining Elements

- Wall contoured to grading, not stepped
- Limestone caps
- Carved limestone decorations on piers
- Gate and piers set back from main wall
- Ornate iron gate
- Shrub plantings along inner curve of wall

Integrity

The wall has had bricks replaced or entire sections rebuilt during its lifetime. Utility poles have been placed near this entrance by the City of Indianapolis, along with stoplights and electrical wires. Three bollards were erected in the center of the drive by the gate to control vehicular access. The original design had a Y-shaped drive between the gate and the road,

with lawn and plantings at the center. The elaborate gate has been repaired numerous times following damage from automobiles.

10. Woodstock Bridge and Gate

The first structure to be built at Woodstock, this filled-spandrel, single-span, concrete arch bridge was built between fall of 1908 and summer of 1909. The bridge spans the ravine that originally separated the properties of Landon and Boyd. During the Landon era, the bridge and gate acted as the main entrance from Woodstock Drive to the Oldfields Estate.

The bridge was designed by civil engineer and former Professor of Engineering at Purdue University, Daniel B. Luten, and built by the National Concrete Company. Luten's design came to be known as the Luten arch bridge, with several extant examples throughout Indiana. Luten was a leading bridge builder with many patents to his name that advanced the design of arch concrete bridges. This example was constructed at the height of his innovation and recognition. The concrete parapet is finished with limestone piers an iron gate with rails at the end closest to Oldfields. Urn finials top the piers, with scroll work decorating the iron gates themselves.

Character Defining Elements

- Concrete arch construction
- Concrete parapet
- Limestone piers with iron gate and railings

Integrity

Asphalt has been laid as the current path surface with loose gravel running parallel to the path at the edges. Historic photos show that the concrete parapet was originally constructed with a slightly different design. The bridge underwent repairs in the early 1990s, but deteriorated in subsequent decades. In fear that it would collapse, the IMA reinforced the understructure with a steel arch in 2016.

11. Interurban Bridge

This single-span steel bridge was commissioned by Landon and Boyd in September of 1908. Also designed by Daniel Luten, this bridge contrasts the concrete bridge at the other end of Woodstock Drive, showing the breadth of Luten's work. The bridge was built to span the Terre Haute, Indianapolis and Eastern Traction Company, the second

largest interurban rail system in the state during its height in the 1920s. There are few, if any, other bridges that relate to the interurban rail system left in Indiana.

The steel bridge is painted and decorated with metal florets at the crossing bars of the bridge railing. Wood planks make up the roadway of the bridge.

Character Defining Elements

- Steel stringer construction
- Decorative railing
- Wood roadway

Integrity
The bridge was repainted and the wood boards of the roadway were replaced in the early 1990's.

12. Formal Garden Bridge

The formal garden bridge spans the shallow ravine between the Lilly House and the Formal Garden above the Ravine Garden. It is a concrete and limestone single span arch bridge and dates to the original construction of the formal gardens sometime between 1913 and 1920.

Character Defining Elements
- Arched concrete and stone construction
- Stone parapet

Integrity
The bridge has been rebuilt in the past, most recently in the 1980s. Steel reinforcement has been added though the original design was retained.

13. Allée

Perhaps the most iconic landscape feature of Oldfields is the allée. The allée frames the front façade of the main house and extends to a focal point in the distance, providing a long, unobstructed view from the house. This very regimented and structured space is lined with trees, originally elms and now red oaks, evenly spaced along both sides of a central lawn. The allée is bisected approximately 1/3 of the total distance from the house by Woodstock Drive.

A unique feature of the allée results from clever grading of the land, which sweeps up just before and dips down to the drive on both sides. This creates the illusion from either end that the drive does not exist. The result is a seamless view of lawn from the house to the large fountain basin at the opposite end.

Centered on axis at the end of the allée opposite the house is a sculpture, *The Three Graces*. It is a greater-than-life-sized statue of three women in flowing gowns on top of a large pedestal. A curved hedge surrounds the back of the allée, linking the two opposing rows of oaks and creating an alcove for *The Three Graces*. The hedge, now hemlock, is in moderate to poor condition due to shade and competition from the now mature white pines and other trees that form the final evergreen backdrop for the allée vista. Between circular fountain

basin, the tall backdrop trees, and the curved hedge at *The Three Graces*, an extension of the allée lawn forms a circular, room-like space. From this space around the basin there are two paths leading to the Border Gardens in opposite directions, one to the northeast and one to the southwest.

Character Defining Elements
- Rows of parallel trees along opposing sides
- Grand lawn with forced perspective. The lawn is divided by the crossing of the Woodstock Drive. The Western portion of the lawn is adjacent to the house, roughly one third the length, is much wider than the Eastern end. The longer and narrower eastern end terminates in the view of the pool, fountain and sculpture. This narrowing of the view forces the perspective.
- Grading of lawn so that Woodstock drive is not visible from House
- Circular fountain basin at vista end of allée with two monumental urns.

Integrity
This space offers a commanding view of the Lilly house. Historic photos show a variety of landscape treatments to the perimeter of the circular lawn, from an extension of the treelined allée to flower beds along the hedges. The view is flanked by two urns on tall limestone columns. They sit at the point where the circular lawn meets the straight lawn of the allée. The urns are highly decorated with grapevine and ram's head motifs. The 1996 assessment lists them in a deteriorated state. Restoration work was completed since that time, and they are now capped to prevent water from sitting inside the urns. Historic photographs and film footage suggest that the fountain jet has changed over time. Some photographs show the fountain in the circular basin once featured a tall single jet of water at its center.

14. Ravine Garden

The Ravine Garden was the first planned garden in Olmsted's garden design. Started in 1921, this garden uses the natural ravine of two conjoining hillsides and Olmstedean ideals of landscaping to create a beautiful vista from the Lilly House terrace. Mrs. Landon gave special attention to this "wild garden" and impressed upon Gallagher the importance of this feature.

Character Defining Elements
- Pools with connecting stone spillways
- Stone terrace walls
- Curvilinear paths following contour of hillside
- Wooden bridge
- Stone stepped paths

- Sculpture

Integrity
The Ravine Garden was restored in 1998 using Percival Gallagher's original drawings and historic photographs. The garden appears very much today is it does in photographs from the 1920s and 1930s, although it is again in need of some restoration work. As its name suggests, the garden is built on two hillsides that create a natural ravine. Starting below the arched bridge adjacent to the formal garden, a series of pools with spillways leads the eye down the ravine towards the canal and towpath. Terracing and stone steps following the water lead down to the canal as well. Near the midpoint a simple oak bridge crosses the water. The bridge is made of a stone deck and wooden handrails of a subtle Asian influence. The bridge is currently stained a deep earthen brown. It is rumored the original was Chinese Red.

The garden had been neglected from the late 1960s through the 1980s and was mostly obscured by pioneer species of trees and weedy shrubs. Thorough research was done before the restoration of the garden. The original stonework survived as a sign of the extensive garden that once thrived on this steep slope. The built stone walls and pools were crumbling, so during restoration the stones were removed and numbered for careful reconstruction. The restored walls and spillways create the most prominent element of the garden, its central meandering water feature. Plantings were replanted in accordance with the original planting plan or as closely as possible with plants available at the time. At the same time a pump house was built along the canal to the north side of the bottom pool. In 2016 the pump was replaced following damage from a storm power surge. In 2017 work was done to repair and maintain the feeder line and filtering system for the pools.

15. Formal Garden

The formal garden pre-dates the Gallagher-Olmstead design for Oldfields. The sunken, walled formal garden was likely designed by house architect Lewis Ketcham Davis. It remained largely untouched until a complete renovation in the late 1990s. Ornately-shaped beds fill space among lawn paths surrounding a central circular basin and fountain. A low wall defines the outer border. Original plans and sketches from the era show planting and bed layouts.

Character Defining Elements
- Geometric bed and path design

- Central fountain
- Sculptures
- Arbors
- Arched concrete bridge connecting garden to south side of house

Integrity

A wide path leads north from the garden towards the house. The path crosses an arched concrete and limestone bridge, which spans the Ravine Garden. This bridge dates to the same time as the Formal Garden. Past rebuilds of the bridge included the addition of steel reinforcement, though the original design was retained.

In the 1990s the garden was restored and extensive research was conducted to establish original intent and design. The original fountain in the form of a young female figure was moved inside for conservation, and a cast fountain of different design was installed. Limestone walls were added to replace those that were originally brick. Photographic records show that original staircases that led from the house to the garden were also brick. When the garden restoration was completed, arbors built to match those in the original photographs were added on all four sides of the square garden space. Also at this time an opening was cut in the south wall to allow for ADA access to the garden without the need for stairs. In October 2016 hedges and plantings were refreshed.

16. Border Gardens

In the fashion often found in Olmstead landscapes at Oldfields, the formality of the grand allée is balanced and flanked by the two Border Gardens. These borders are laid out in a meandering and naturalistic style. The characteristics that differentiate these two spaces from the allée provide their significance.

Character Defining Elements
- Curvilinear lawn paths
- Small garden putti sculptures
- Naturalistic planting beds

Integrity
The two border gardens were designed with curvilinear lawn paths that meander along the length of the allée behind the regimented rows of the allée trees. Many specimen trees (European beech, oak, pine, and spruce) were planted to form a dense cover that would provide a backdrop for the open lawn on the allée. Paths were lined with sun-loving perennials and bulbs. Two limestone Putti sculptures grace these woodland gardens and are believed to be from the Landon era.

Photographic records show peonies, irises and tulips in these gardens. The trees have now matured and form a very dense canopy, though many have died or fallen in storms over

the century since they were planted. Replacements have been added to maintain the density, and a number of impressive original specimens survive. As lawn paths became too shady to be maintained and muddy conditions arose, slabs of stone and slate were

added by the IMA in many areas of the border garden paths over the years. These stonework and grass paths need to be replaced, and drainage issues corrected in a number of places.

17. Orchard

Orchards are popular features of country estates and there has been an orchard at Oldfields since its inception. Evidence found in correspondence from Hugh Landon show that there was a dedicated staff to care for the greenhouse and fruit trees found in the orchard.

Character Defining Elements

- Fruiting trees and shrubs
- Arbor with gate
- Path entrance to border garden

Integrity

Extensive research and work has been done to recreate an orchard in the place where one existed during the Landon and Lilly eras. The current orchard was planted in 2007. The replacement apple trees, which form an axial path from Woodstock Drive opposite the greenhouse to the northeast Border Garden, were moved onsite as large trees to give a sense of age and permanence to the garden. A small vegetable garden, which was not originally part of the orchard, sits to the south of the apple allée. Small fruits line the east end of the rectangular vegetable plot. A large arbor with gates was built when the garden was rebuilt.

18. Four Seasons Garden

The Four Seasons Garden adjoins the Recreation Building, commonly called Garden Terrace. Shown as pasture on the Olmstead plan, this garden was added by the Lilly family in the 1940s when the Recreation Building was built. Virginia Prince was the designer. A central, circular fountain basin sits in a depression in a circular garden lawn. A low, stacked stone wall creates the terracing from the upper, entry level to the garden. Four sets of stone steps equally spaced around the wall allow for access to the upper and lower lawns. Yew hedges enclose the space with openings on the north, south and east sides. The west side features a large marble bench inset into the hedge with a small pad of stone at its base. The fountain in the center features four jets that simply arch into the basin from four equal points around the circumference. Narrow planting beds between the yew hedges and lower interior boxwood edging hedge are filled with herbaceous perennials and seasonal plants. Each of the quadrants features a limestone statue,

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representing one of the four seasons, inset into the taller hedge. Adjoining the garden, outside the hedge, a large bluestone patio and walkways link the garden to the Recreation Building and to the terrace that once edged a swimming pool. The pool was centered on the building facing to the south. Large trees and a few younger specimen trees line the edge of a large lawn to the west that was once the old recreation lawn.

Character Defining Elements

- Central circular fountain basin
- Terraced levels made of stacked stones
- Stone steps
- Yew hedge circling perimeter
- Four (4) cast stone sculptures representing the four seasons
- Semi-circular marble bench

Integrity

The garden was restored in 1998 following the original design. However, the bluestone pavers linking the garden to the Recreation Building are in poor repair and need to be replaced.

19. Canal Walk

The canal was built in 1837 as part of the state's Internal Improvement Program to connect the Wabash River in Wabash and the White River near Evansville. The canal was formally opened in 1839 with the section along Oldfields, connecting Broad Ripple with Indianapolis. The canal was sold to the Water Company of Indiana in 1871.

Character Defining Elements

- Crushed stone path
- Follows bank of canal

Integrity

The walk along the canal appears in the earliest photos of Oldfields and connected the bottom of the Ravine Garden to the south of the house to the now non-existent vernacular garden to the north of the house. In early photos it appears as a naturalistic and idealized setting, though it did not appear to be addressed in the Olmstead plan for the gardens.

20. Interurban Railroad Path

The Terre Haute, Indianapolis and Eastern Traction Company was founded in 1907 and grew to be the second largest interurban until its incorporation into the Indiana Railroad in 1931. The Indiana Railroad abandoned all operations in 1941. It is unclear how long trains ran on the section of rail that passed through the estate. There was one stop on the property located adjacent to the barn.

The interurban railroad path runs along the entire eastern edge of the property. Starting at the canal from abutments for an old bridge, the path continues up a shallow grade,

creating a deep depression in the terrain until it flattens out and runs parallel to Michigan Road. The path is approximately 30 feet wide and has reinforced stone walls at its deepest locations near the steel bridge mentioned above.

Character Defining Elements
- Stone retaining walls
- Depression in landscape

Integrity
The stone walls are composed of large, mostly round stones and are in varying stages of maintenance. A few wall sections are fully intact while others are sagging from water movement. A few sections of the walls have collapsed completely. No rails or ties remain along the path. Water drainage lines from throughout the gardens dump water into the path, and thus the area is subject to frequent flooding from large rain events.

C. Newfield

Newfield was not initially part of Oldfields. The building is located on a part of Woodstock that would have originally been owned by Landon's partner, Linnaes Boyd. Boyd divided and sold off parcels of land, which were eventually purchased by J.K. Lilly Jr. throughout the 1950s and 1960s. By the mid-1960s Lilly had purchased and razed all surrounding houses except one.

Newfield is included in the National Historic Landmark designation for the Oldfields Estate, though for the purposes of this policy it is listed as a separate site.

1. Main House

The house was built in 1939 for J.K. and Ruth Lilly's son, J.K. Lilly III and his new wife Jean Heller. Frederick Wallick is believed to be the designer of the house, as drawings indicate the use of the same subcontractors at both Garden Terrace and Newfield. This is the only house Lilly built on the lands adjacent to the original Oldfields Estate. The formal entrance is a gate at 38th Street, and a secondary road leads from Newfield to Woodstock Drive and the main house at Oldfields.

Newfield is a two-story wood-framed structure finished in red brick, supported by concrete block on a poured concrete foundation; the garage and screened porch are only one story, with the basement running the entire length of the house. It is built in the Neoclassical style. It has limestone detailing around the casement windows and horizontal bands similar to Garden Terrace. The front porch is constructed out of stone with ionic columns for support. A slate roof, copper gutters, and arched wood shutters

complete the house. Most floors are oak plank, except the entry hall, which has an oak herringbone design. The floors in all the bathrooms and the kitchen were originally tile.

Character Defining Elements
- Brick with limestone detailing

- Casement windows and French doors
- Slate roof
- Hardwood floors
- Limestone front porch with pediment and ionic columns
- Arched wood shutters

Integrity
Newfield has changed very little since it was built, with only superficial changes such as new paint, carpeting and flooring in some locations, along with new kitchen countertops. In 2016 the IMA updated several mechanical systems, installed a washer and dryer, and repaired the roof and plaster walls. This work was in preparation for the house to be used as a new Scholar's Residence. Doors on the second floor were screwed shut to make four individual suites out of the bedrooms. On the east end, a new doorway was cut into a wall to connect two adjacent rooms, creating a larger two-room suite. These are the only documented architectural changes to the house.

2. Pump House

The Newfield pump house is located to the north of the main house. It is a red brick, single story structure with a slate roof. The house is approximately 400 square feet and housed the irrigation equipment for Newfield.

Character Defining Elements
- Hipped slate roof with dormer vents
- Brick construction to match main house

Integrity
The architecture of the house has changed very little. The door was replaced by a modern metal double door at some point. After the IMA took over operation of the estate and surrounding gardens, electrical utilities were added to the interior of the house. Its intended use continues to this day.

3. 38th Street Gate

This gate served as the main entrance to Newfield and was constructed in 1940, the same time as the house. The iron gate is made up of a geometrical diamond pattern with a scrollwork design at the top. A run of swag and floret details divide the diamond motif from the scrollwork at the top. Finials top the hinged ends of the gate. The gate is supported by a red brick pier and wall. The driveway continues straight to the front of the house, where it circles around a small planting of shrubs and flowers. Two short arms extend off the circle at one end: one provides access to the garage and the other connects to a drive leading to Oldfields.

Character Defining Elements

- Stepped brick wall with limestone foundation and cap
- Electric copper and glass lanterns at top of piers
- Geometric iron gate with swags and rosettes

Integrity
The iron gate, brick and limestone work, and lanterns are all in need of restoration. Additional paving has been added to the east of the driveway creating additional parking for guests.

4. Surrounding Lawn and Garden
Many changes have occurred to the landscape surrounding Newfield over the years. The current entry drive is in an ellipse form and is based on old photographs. Remnants of various walkways and garden spaces remain at the rear of the house.

D. Westerley

Built within the Golden Hill neighborhood, itself listed on the National Register of Historic Places, Westerley derives its importance from a rich history of people and sense of place. Similarly to the way Oldfields was created as part of Woodstock, Westerley was created out of the subdivision of a large estate owned by local industrialist David M. Parry. In 1915, after Parry's death, his family subdivided the 100-acre country estate into multiple residential lots. The lot that would eventually become Westerley was purchased by local businesswoman Josephine B. Doud Frawley and her second husband Frank D. Frawley.

Doud made her fortune in the confections business after purchasing the rights to the Betsy Ross Candy Company in Chicago. A prolific candy maker in her own right, she and her son Raymond Doud eventually grew Betsy Ross Candies, Inc., to include over a half dozen locations. Her success allowed for the purchase of the land in Golden Hill in 1922. She hired Frederick Wallick, the same architect who would later design the first renovations of Oldfields for the Lilly family, to design the original Italianate-style mansion. It was completed in 1923. She hired Jens Jensen, the Chicago-based landscape architect, to lay out the grounds of the estate. Jensen was known to Indianapolis at the time for his work at estates across the White River at what is now Marian University.

The property was sold to Dr. George H.A. Clowes and Edith Whitehall Clowes in 1933. There is no evidence of Betsy Ross Candies, Inc., in Indianapolis after World War II. It's

probable that the depression contributed to the company's disappearance and the Doud family's move to Florida. Members of the Clowes family, who gave the name Westerley to the estate, lived in the house continuously until 2001, when it was bequeathed to the IMA by Allen Whitehall Clowes.

In 1944 the Clowes family purchased the adjacent lot to the south, expanding the property to its current 5.5 acres and adding many features that remain to this day, including the formal walled gardens, greenhouse, carriage house, and north patio with indoor pool. They also expanded the main house and changed the façade to include half-timber Tudor-style architectural details as well as English-style Neoclassical details on the interior.

1. Main House
The original Italianate-style house was built in 1915 by local architect Fredrick Wallick. It is a four-story structure with a finished basement and attic apartment. The asymmetrical layout and exterior stucco façade are indicative of the house's original design intent. The important features remaining today are the ceramic tile roof; arched entry above the front door; projected windows and balconies supported by corbels; and the suggestion of a loggia in the living room overlooking the back terrace. Three brick chimneys rise from the roof. The southernmost chimney is a different style from the other two, having been constructed as part of a later expansion by the Clowes family.

Character Defining Elements
- Ceramic tile roof
- Half-timber and stucco façade
- Projected windows and balconies supported by corbels
- Terraced garden access

Integrity
The renovations initiated by the Clowes family changed the overall look of the house by adding a Tudor-style timber façade and extending the south wing of the house. The extension allowed for a large dining room and master suite. This change is now integrally important to the house's use and as a physical manifestation of the layers of history and ownership of the estate. The Tudor-style changes to the house were enhanced by the addition of a walled English garden and greenhouse.

The house is now home to the Director of Newfields. It is an important asset in the cultivation of donors and as a space for events, housing for distinguished guests of Newfields, and fundraising activities such as private dinners. These activities are made possible due to the large formal dining room and relative privacy of the master suite, both enhanced by the Clowes-era renovations.

With the bequest of the estate to the IMA came a major renovation and modernization to the house. All mechanical systems were upgraded and brought up to code. The small attached garage added by the Clowes family was removed, and replaced by a breezeway connecting to a two-car garage. The garage honors the original Italianate design with a flat roof. All windows and doors were replaced with the fenestration for the most part

remaining intact. The kitchen was opened up with the removal of a wall, and modern appliances were installed. The elevator was removed.

The indoor pool added by the Clowes family was filled and the roof removed, creating a large patio area off the basement to the north. Decking was added to create a walk around the garage to the patio. Changes were also made to the driveway, removing the large island of grass in the middle of the circular drive and replacing it with a circular basin fountain.

2. Carriage House

Looking at planting plans of the estate from 1924, it appears that a detached garage has always been part of the estate plan, though no other documentation of when the building was built has been found relating to the Doud era of the estate. Today it is a two-story building with the ground floor consisting of a four-bay garage, mechanical room and bathroom. The second floor is a one-bedroom living space with kitchen, living room and bathroom. The east bay of the garage is only one story, added to the structure by Allen Clowes in the 1980s.

The carriage house matches the main house, with the same Tudor-style façade and brick chimney. The carriage house opens to a small courtyard created by the brick walls added by the Clowes.

Character Defining Elements
- Half-timber and stucco façade
- Ceramic tile roof
- Carwash system in garage space (non-functioning)

Integrity
The carriage house has changed little during the IMA's ownership, with only superficial changes to furnishings and mechanical upgrades. A carwash system consisting of a moveable overhead water system and drain remain in the center bay of the garage. Though not currently operational, it is an interesting artifact of the country house lifestyle.

3. Greenhouse and Gardening Shed
The greenhouse was built by the Clowes family. It is in the northeast corner of the formal garden on grade, making the greenhouse and not the attached gardening shed the primary focus of the structure. The greenhouse has doors at both ends, to the west opening out

under the pergola of the formal garden and to the east to a head house. The head house and separate garden shed adjoin the greenhouse on the east end. They head house shares a wall and can also be entered from a separate exterior door. The gardening shed is adjacent to the head house to the east. The greenhouse and gardening shed would have supported all horticulture activity of the estate, and so their presence indicates the importance of the gardens to the residents.

The environment of the greenhouse is regulated by hinged windows along the bottom wall of the south side as well as hinged windows running along both sides of the peak. Finned hot water radiators provide heat produced by a boiler in the carriage house.

Character Defining Elements
- Tile roof
- Split level design
- Leaded windows
- Soil floors under benches

Integrity
Cold boxes or frames once lined the exterior of the south wall. Greenhouse thermostats as well as an automated pulley system have been added to operate the closing and opening of the upper windows. The boiler in the carriage house was replaced in 2016. More research is needed to understand past changes.

4. Formal Garden

The formal garden is located on the south side of the property between the main house and carriage house. The space was originally designed for Josephine Doud in a more naturalistic style. Doud originally hired famed landscape architect Jens Jensen who laid out a comprehensive, naturalistic plan for the property. This original garden features winding paths, meandering woodland walks and rock gardens.

The garden was largely replaced by the Clowes family as part of the English Tudor-style transformation of the estate.

Character Defining Elements
- Walled garden
- Wisteria trellis
- 3-tiered fountain
- Bluestone pavers
- Wooden garden gates

Integrity
The area to the south of the house and drive was transformed from naturalistic to formal with the addition of walls and the greenhouse was added. The space is divided in two sections with an open lawn near the greenhouse for gardening and a more formal, designed space closer to the main house. The naturalistic paths were replaced by formal flower beds, lawn, and stone and brick pathways. Wooden garden gates provide access, and a large

opening framed with columns in the south wall provides a sense of space and perspective. A cascading fountain is opposite the opening in the north wall.

The gardens went through an additional renovation in the 1980s when Allen Clowes hired Mark Holeman to renovate the formal gardens.

5. Surrounding Lawns and Garden

Remnants of Jensen's original garden remain primarily to the north and south of the house. To the south the most obvious Jensen elements remain in the form of a series of natural stone steps, paths and a shade garden. The plantings have been reinterpreted in the original style to compliment the hardscape by the residents and horticulture team in 2014 to the present. To the north of the house in the low-lying woodland, the remnants of Jensen era paths, foot bridges and stone wishing well can be found.

IV. Guidelines and Strategies (Decision-Making Criteria)

When making decisions concerning the maintenance and use of the various historic properties and sites, Newfields will refer to the *Secretary of the Interior's Guidelines for the Treatment of Historic Properties* and *Guidelines for the Treatment of Cultural Landscapes* as referenced above in Section I.

Using their four approaches -- preservation, rehabilitation, restoration, and reconstruction -- the following guidelines provide site-specific decision making criteria when addressing issues such as maintenance of features, replacement of damaged material, and adaptive reuse. The sites are ranked according to their historic integrity and listed in that order, with Miller House being the most intact of all the sites followed by Newfield, Oldfields, and finally Westerley.

Level 1 – Level of integrity – Original
Approach: Preservation

Miller House and Gardens

For the most part Miller House and Gardens is much as it was when the Miller family lived at the residence. As stated before, a few changes were made while the Millers lived in the house, but all changes involved the original designers. This treatment of the design intent, along with the fact

that the house and gardens were given their landmark designation while the family still lived in the house, make a strong case for stringent stewardship.

Newfields will follow these standards and guidelines for preservation when addressing this property to the best of its ability using available resources.

1) The main house functions as a historic house museum with office and collection storage spaces which maximize the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, the property will be protected and, if necessary, stabilized until additional work may be undertaken.
2) The historic character of the property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3) The property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features or plantings that need replaced due to damage will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4) Changes to the property that have acquired historic significance in their own right will be retained and preserved. These include all changes made during the lives of the Miller family while they resided in the house.
5) Distinctive materials, features, finishes, construction techniques, examples of craftsmanship, or plantings that characterize a property will be preserved.
6) The existing condition of historic features and landscapes will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair, limited replacement of a distinctive feature, or new plantings, the new material will match the old in composition, design, color, and texture. New plantings will be chosen for physical characteristics to match the design intent.
7) Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

Level 2 – Level of Integrity – High
Approach: Rehabilitation

Lilly House, Newfield, Chauffer's Cottage, Root Cellar, Canal Pump House, Alleé, Ravine Garden, Four Seasons Garden, Interurban Bridge

These sites remain largely intact and reflect historic changes relevant to their history. They have also undergone some alterations that reflect adaptive reuse, such as the addition of a new visitor's entrance at Lilly House, the retail space at the Greenhouse, and modern kitchens at the Chauffer's Cottage and Newfield. These changes have had little impact on the significant character defining qualities of these sites, though it is acknowledged that these changes have occurred. While acknowledging that use of these

buildings may change in the future, characteristics that make these sites historically significant will be retained.

Newfields will follow the standards and guidelines for rehabilitation when addressing these properties and their surrounding landscapes to the best of its ability using available resources.

1) A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.
2) The property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features or plantings that need to be replaced due to damage will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
3) Changes to the property that have acquired historic significance in their own right will be retained and preserved. These include changes made by the Lilly family while they lived on the estate.
4) Distinctive materials, features, finishes, construction techniques, examples of craftsmanship, or plantings that characterize a property will be preserved.
5) The existing condition of historic features and landscapes will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair, limited replacement of a distinctive feature, or new plantings, the new material will match the old in composition, design, color, and texture. New plantings will be consistent with respect to the alleé and Ravine Garden.
6) Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
7) New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

Level 3 – Level of Integrity – Moderate
Approach: Restoration

Oldfields Greenhouse, Double, Barn, Garden Terrace, Michigan Road Gate, Formal Garden, Border Gardens, Orchard

These sites have undergone changes that have impacted the significant character defining qualities of their structure and surrounding landscapes. These changes include alterations or additions to their exteriors that greatly impact their historic integrity, such as the vinyl siding on the Double and Barn, the extension of the main entrance and filling of both pools at Garden Terrace, and the addition of the garage and removal of the pool at

Westerley. The Double and Barn are two structures that have never been involved in any interpretation strategies and as a result have not been maintained to any historical standard.

Newfields will follow the guidelines for restoration and rehabilitation when addressing these properties and their surrounding landscapes to the best of its ability using available resources.

1) The property will be used as it was historically or be given a new use which reflects the property's restoration period.
2) Materials and features from the restoration period will be retained and preserved. The removal of materials or alteration of features, spaces, and spatial relationships that characterize the period will not be undertaken.
3) Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate and conserve materials and features from the restoration period will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4) Materials, features, spaces, finishes, and plantings that characterize other historical periods will be documented prior to their alteration or removal.
5) Distinctive materials, features, finishes, construction techniques or examples of craftsmanship, and plantings that characterize the restoration period will be preserved.
6) Deteriorated features from the restoration period will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. In the case of landscapes, the replacement will be of the same species or a species with similar characteristics to achieve the design intent of the original.
7) Replacement of missing features from the restoration period will be substantiated by documentary and physical evidence. A false sense of history will not be created by adding conjectural features, features from other properties, or by combining features that never existed together historically.
8) Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
9) New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

Level 4 – Level of Integrity - Low
Westerley, Woodstock Bridge, Newfield Gate, Vernacular Garden, Interurban Path

These sites have been rebuilt in the recent past, had extensive repair/renovation, or are in need of complete rebuilding. The Vernacular Garden no longer exists. The other structures have not vanished, but are either in such a state that a complete rebuild is needed or have already been rebuilt so that they are not completely original in their construction.

When possible Newfields will follow the standards for rehabilitation or reconstruction when needed to the best of its ability using available resources.

1) Reconstruction will be used to depict vanished or non-surviving portions of a property when documentary and physical evidence is available to permit accurate reconstruction with minimal conjecture and such reconstruction is essential to the public understanding of the property.
2) Reconstruction of a landscape, building, structure, or object in its historic location will be preceded by a thorough archeological investigation to identify and evaluate those features and artifacts which are essential to an accurate reconstruction. If such resources must be disturbed, mitigation measures will be undertaken.
3) Reconstruction will include measures to preserve any remaining historic materials, features, and spatial relationships.
4) Reconstruction will be based on the accurate duplication of historic features and elements substantiated by documentary or physical evidence rather than on conjectural designs or the availability of different features from other historic properties. A reconstructed property will re-create the appearance of the non-surviving historic property in materials, design, color, and texture.
5) A reconstruction will be clearly identified as a contemporary re-creation.

III. MAINTENANCE, CARE and DOCUMENTATION

The IMA is committed to maintaining the historic properties and other buildings in its care to the best of its ability using available staffing and funding resources. The Horticulture and Natural Resources and Operations divisions are responsible for oversight and care of the historic properties. The IMA maintains a 10-year capital plan and allocates resources as necessary for this purpose.

Preventive maintenance inspection checklists and walk-throughs are conducted on a regular basis by staff and external consultants to assess needs and priorities (*Appendix F* Annual Inspection Sheet for Historic Properties). Staff will document changes to the properties as needed and will maintain a comprehensive archive of any preservation, rehabilitation, restoration and reconstruction efforts. See *Appendix G* for Historic Structure Treatment Report.

APPENDICES

A. The Horticulture and Natural Resources Committee Charter

B. The Buildings and Grounds Committee

C. Oldfields – Lilly House and Gardens National Historic Landmark Nomination

Newfields
Historic Preservation Policy
9/18/2017

D. Miller House and Garden National Historic Landmark Nomination

E. Detailed map of each site

F. Annual Inspection Sheet for Historic Properties

G. Historic Structure Treatment Report