Rothner Residence

Conservation Management Plan

Jefferson University College of Architecture and the Built Environment

MHP-603: Restoration and Rehabilitation of Modern Structures

Spring 2020

Introduction

This Conservation Management Plan is the product of research of existing documentation and physical inspection of the interior and exterior of the building. We have:

- Researched and documented a brief history of the Rothner Residence and its evolution;
- Identified character defining features that contribute to the significance of the structure;
- Identified building materials and assessed and detailed the extent of their distress visible;
- Developed a series of prioritized recommendations and repairs;
- Researched and developed 12 unique projects to contribute to the further study of the Rothner Residence and its Conservation Management Plan.

This report contains drawings and photographs of representative conditions illustrating the survey findings. These, along with survey drawings and projects, can be found in the appendix of this report.

The recommendations contained with this report are researched hypotheses of a class of 12 undergraduate and graduate students of Jefferson's College of Architecture and the Built Environment, informed by their knowledgeable faculty.

Sincerely,

Talcia Brown, Alan Davidson, Rose Davis, Alison Eberhardt, Riley Gardiner, Adam Hoover, Srinithi Jaganathan, Alex Jones, Grace Messner, Helen Phan, Jessica Radomski, and Spencer Rubino

Acknowledgements

The MHP-603: Restoration and Rehabilitation of Historic Structures class would like to thank the following individuals who helped bring this Conservation Management Plan to realization:

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Dave Bone, Bone Energy

Finally, thank you to **Janet Grace**, owner and steward of the Rothner Residence, for welcoming us into your house to study it and learn from it.

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1.0 Introduction

1.1 Methodology of the Conservation Management Plan Contributor(s): Alison E.

The development of a Conservation Management Plan (CMP) begins with an initial phase of research gathering, analyzing, and assessing the information about the place and its condition, history, and associations. Understanding the history of the place aids in the identification of its character defining features, which helps prioritize the treatments and level of intervention needed to conserve or preserve the building's historic fabric. This plan uses guidelines set forth by the National Parks Service and the Secretary of the Interior's Standards but is tailored to the specific needs of the Rothner Residence.

The CMP provides a framework within which conservation, the continued care of the site and building, will be carried out in accordance with the Secretary of the Interior's Standards and the guidelines set forth by the Philadelphia Historical Commission. The entire CMP is guided by a statement of significance, which is a succinct summary of the site's values and characteristics that must be preserved, using the recommendations given by this CMP document.

1.2 Structure of the Conservation Management Plan Contributor(s): Alison E

In preparing the CMP, extensive research and analysis was conducted into the history and original architect, Norman Rice. The development and the design of the landscape was also considered, as were the original owners and their association with the site, the architect, and Philadelphia. The outline of the CMP is indicated below:

- Chapter 1 provides an introduction to the site and the CMP itself.
- Chapter 2 details the history of the site, its architect, occupants, and their place in the history of the area, Philadelphia, and the Mid-Century Modernism movement.
- Chapter 3 includes an analysis of the historic materials and systems used in the building.
- Chapter 4 outlines the existing condition of the building and its landscape.
- Chapter 5 proposes treatments for the conservation, preservation, and repair of the failing or deteriorating aspects of the building.

- The appendices include existing drawing documentation, drawings annotated with specific conditions, and 12 individual proposals meant to contribute to the goal of the CMP.

First, the history of the building, its site, and its occupants were researched and outlined. An owner's timeline was created, as was a family tree detailing the connection of the architect to the original occupants who commissioned the building. On-site analysis, done with visual observation informed the conditions assessment of the CMP. A treatment plan was developed in tandem with this conditions assessment. While on site, the building and site were measured to produce existing documentation, which includes photographs of the Rothner Residence as it stands in March of 2020. These steps contributed to the final CMP document.

1.3 Limitations of the Conservation Management Plan Contributor(s): Alison E.

The CMP provides broad guidelines for the ongoing use and care of the site. More detailed appendices outline potential future uses, including a maintenance plan and guideline for potential additions to the building. These guidelines and appendices will ensure the future conservation and management of the site's many significant values for future generations.

The policies and guidelines outlined in the CMP will require future updating and peer review when the time to implement them comes. It is recommended that each of these policies is reviewed by a competent preservation professional and be developed further, as some specialist site work and testing was not part of this document.

The CMP is not intended to be a static document. Rather, it should be reviewed and revised to incorporate the results of new investigations in response to changing conditions and values of the site. The Rothner Residence was, is, and most likely will continue to be a residence. The needs of current and future homeowners must be taken into account as well as the preservation of historic fabric.

Lastly, this CMP document was undertaken three months before the COVID-19 pandemic spread to Philadelphia and terminated in-person attendance at Jefferson University. As such, field work was limited to two trips to the site before the campus was closed in mid-March. Investigations of the condition of the property were limited to visual observations and information recalled later off-site through photographs. Research was

limited to digital archives and publically-accessible resources as all archives and museums were closed to the public.

1.4 Brief Report Summary and Abbreviated Statement of Significance

Contributor(s): Alison E., Jessica R.

The Rothner Residence is in good condition and retains much of its historic integrity, despite alterations from previous homeowners. It is one of many residences constructed in the Mid-Century Modern style along West Schoolhouse Lane in East Falls, yet it is each individual structure that contributes to the diverse pocket of Mid-Century Modernism extant in the neighborhood.

Janet Grace, owner since 2009, has helped to maintain the historic integrity and character of the Rothner Residence with sensitive interventions that better the building and her as a resident of the house. Residences can be challenging structures to preserve as the needs of the full-time occupant must be balanced with the needs of the building, and if the building isn't comfortable, people will not want to occupy the building. The more time a building is spent occupied, the more it will be cared for as deterioration will be more quickly spotted and rectified.

The Rothner Residence was constructed and completed as a single family residence for Dr, Jacoby T. Rothner and Mrs. Leah M. (Margolis) Rothner in 1951. Since its completion, the building has retained its use as a residence, but has passed ownership five times and endured multiple alterations to its original design and footprint. These physical changes did not affect the integrity of the building's historic fabric as a Mid-Century Modern house as its significance lies in its existence as a non-disrupted example of modernist architecture in East Falls, Pennsylvania. The period of significance for the Rothner Residence spans from the start of the house's construction in 1948 to the end of the Rothners' ownership of the property in 1961.

2.0 History of the Rothner Residence

2.1 History of East Falls and West Schoolhouse Lane

Contributor(s): Alison E., Srinthi J., Spencer R.

The evolution of Schoolhouse Lane can be best broken into three eras: Colonial (1700s - 1850s), Post Civil War (1870 - 1900), and 20th Century. Although each era is characterized by different architectural styles, a common theme of family estates prevails through the history of West Schoolhouse Lane.

Colonial Era (1700s - 1850s)

Germantown and East Falls were characterized by large plantations and family farm plots. Schoolhouse Lane was a major route that connected Germantown and Ridge Avenue to the Schuylkill River, where goods and materials were brought up from the city via the river. The shipment of goods up the Schuylkill River made East Falls a hub for wealth and commerce. The Yellow Fever epidemic also increased the wealth of the area, as many wealthy families had summer vacation homes on Schoolhouse Lane.

Post Civil War (1870 - 1900)

The characteristic family farm plots and plantations were expanded into larger estates, like Ravenhill on the western end of the road. Smaller family homes began to appear on historic maps in between larger farms.

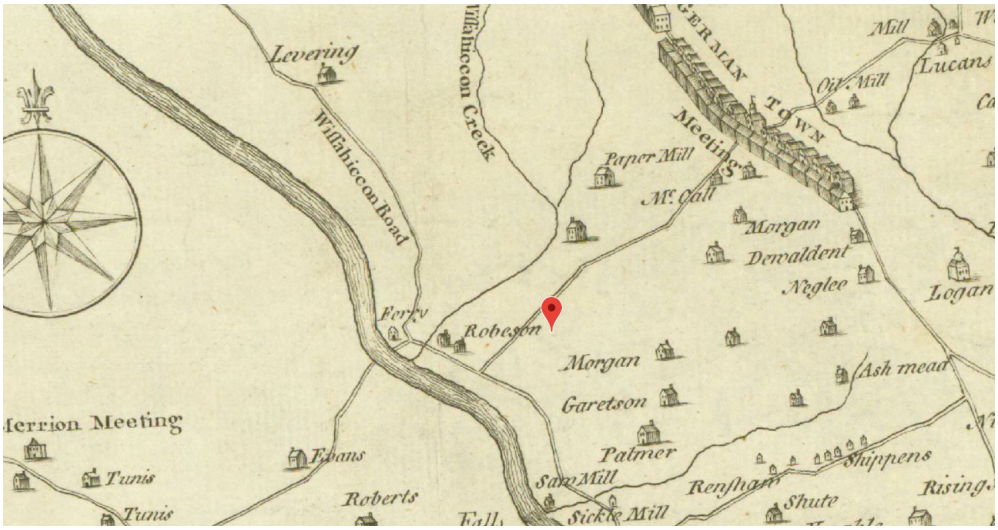
20th Century

The large estates were subdivided into smaller plots and developments, like the homes along Apalogen Road, though some of these estates remained intact for the more wealthy elite. The grand Alden Park apartments were constructed on the eastern end of

Schoolhouse Lane, contradicting the appearance of several Mid-Century Modern homes, including the Rothner Residence on the opposite end of the road.[1]

2.2 History of the Rothner Residence Site Contributor(s): Spencer R.

The earliest map of the area that was found dates to 1760. What can be seen from this map is that the property is unlisted, therefore it can be speculated it is forest or farm property. It is close to an early Schoolhouse Lane that leads to Germantown in the right hand corner of the map. The closest property that may have had land ownership of the property was either the Robeson family or the Morgan family.



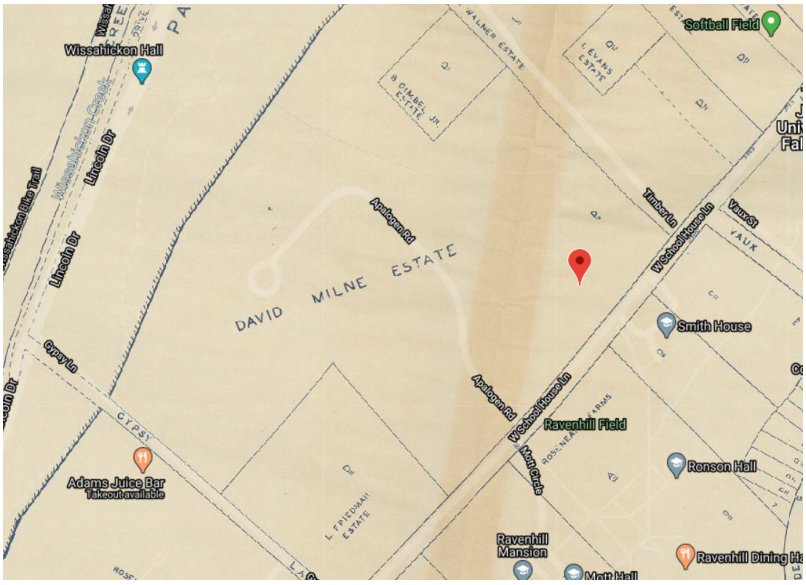
1760 Map by N. Scull and G. Heap above. “PhilaGeoHistory Maps Viewer.” Accessed February 18, 2020. https://www.philageohistory.org/tiles/viewer/.

In an 1855 map as seen below it can be noted that Schoolhouse Lane has been established in its present location. The property, while not entirely clear, seems to be owned by the Smith family who established their house across the street from the property. A stream can also be seen leading into the Wissahickon from the property’s location.

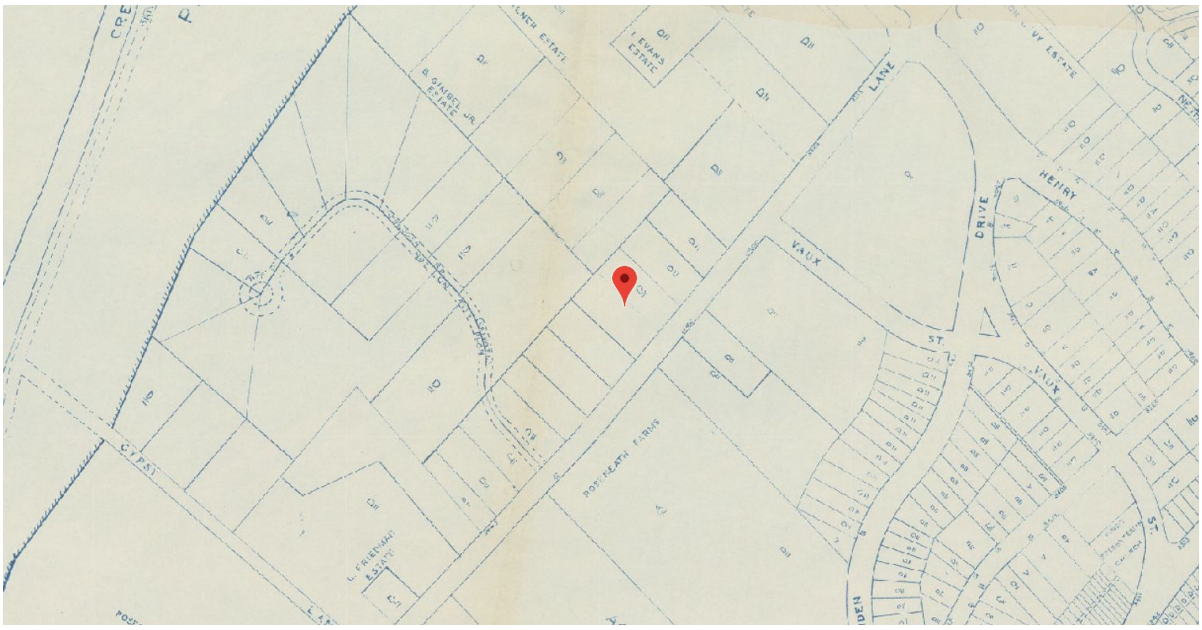
[1] Joseph Minardi. “History Matters: The Amazin’ Weightman.” East Falls History, published September 7, 2017. https://nwlocalpaper.com/history-matters-the-amazin-weightman.

1855 Map by R.L. Barnes above. “PhilaGeoHistory Maps Viewer.” Accessed February 18, 2020. https://www.philageohistory.org/tiles/viewer/.

By 1895 the land had begun to be parceled out to other owners and additional roads can be seen. It is clear that the property is owned by Caleb J Milne, and would continue to own it through 1910 until a person of some relation, possibly his son, David Milne, came to own the property, as indicated by a WPA map dated 1942. By 1962 the Milne property had been completely parceled out and represents the parcels that we see today. The property now sits on its current parcel along with the other properties.



1942 Map from the Works Progress Administration. “PhilaGeoHistory Maps Viewer.” Accessed February 18, 2020. https://www.philageohistory.org/tiles/viewer/.



1962 Map by the Works Progress Administration above. "PhilaGeoHistory Maps Viewer." Accessed February 18, 2020. https://www.philageohistory.org/tiles/viewer/.

2.3 Mid-Century Modernism in Philadelphia Contributor(s): Helen P., Grace M.

Despite the popularity of traditional styles in the area, Mid-Century Modern houses started to gain traction due to their association with high brow culture. Common features of these houses were the use of "off the shelf", prefabricated materials and also simple forms, void of ornamentation. Chestnut Hill was a hotspot for Mid-Century Modern architecture in the late 40's to early 50's and its influence spilled into East Falls. These properties seemed to be centered around access to Fairmount Park and Forbidden Drive. Since the Rothner Residence was one of the first modern houses in the area, the discussion is centered around buildings built before or at the same time. Then the greater context of what was happening in the modern word added a deeper understanding of the broader events and ideas that are influential to modernist history.

Local Modernism in Philadelphia

To get a sense of how Modernism was impacting the city of Philadelphia and the area surrounding the Rothner House, we chose to look at several Mid-Century Modern residential projects that were either constructed before or in 1951. The first houses we

examined were three located on the same street, Lynnebrook Ln in Chestnut Hill, which is one of the many concentrations of Modernist housing in the area. They are the Andrews' Residence by George Wharton Pepper Jr. (204 Lynnebrook Ln), the Saller Residence by Bishop and Wright (200 Lynnebrook Ln), and the White Residence by Wilson White (205 Lynnebrook Ln), which were constructed in 1947, 1948, and 1949 respectively. Robert F. Bishop was first trained at Swarthmore College and then became a fellow at Taliesin, while John W. Wright earned his B.Arch at the University of Pennsylvania[2]. As a fellow, Bishop was greatly influenced by Frank Lloyd Wright's approach to materials, community planning, and residential design, which would carry through his career as he continued to practice with several different architects such as M. Ward Easby and Newcomb Montgomery. The Saller Residence makes use of Wrightian roof forms and a common local material, Wissahickon schist.[3] George Wharton Pepper, Jr. was also practicing Modernist-style architecture in Philadelphia, and had even worked with Norman Rice, but never on a residence. Frank Weise worked under George Howe and Louis Kahn after completing his degree, as well as Walter Gropius and Marcel Breuer at Harvard. His 1951 design of the Carner Residence at 5501 Houghton Street illustrates a play of public versus private space with the spaces in the front the house being well covered and the back opening up with glass as had been done on the Rothner house.[4] Finally, we looked at Louis Kahn's 1947 Roche House at 2101 Harts Ln in Philadelphia. We wanted to include a work of Kahn's because he is considered the most prominent architect of Philadelphia and whose work is highly influential in the modernism movement in Philadelphia. Louis Kahn was part of what was known as the "Philadelphia School", which refers to a group of architects looking to create a new kind of architecture for the city in this time of urban renewal.[5] The house was designed with another prominent Philadelphia architect, Oskar Stonorov, who designed many housing developments and modernist public housing in Pennsylvania. The house features an open-plan living room, access to a private walking trail, a brick living room wall, and also a character-defining fireplace placed at an oblique angle.

[2] "Bishop, Robert Forsythe (1908-1984) -- Philadelphia Architects and Buildings," Philadelphia Architects and Buildings (The Athenaeum of Philadelphia.), accessed March 2020, https://www.philadelphiabuildings.org/pab/app/ar_display.cfm/24191)
[3] Emily T Cooperman, "Truly and Obtrusively Modern," Context (Naylor, 2015), https://www.aiaphiladelphia.org/sites/default/files/uploads/context_winter_16.pdf)
[4] Diane M. Fiske, "A Mid-Century Home in Roxborough That 'Flows from inside to out'," The Philadelphia Inquirer (The Philadelphia Inquirer, August 5, 2019)
[5] Izzy Kornblatt, "Louis Kahn and His Philadelphia Architecture Revolution," Curbed Philly (Curbed Philly, February 20, 2018), https://philly.curbed.com/2018/2/20/16938652/louis-kahn-philadelphia-school-of-architecture-history)

Broader Modernism Context

More broadly, there are several events that we chose to highlight to explain how modernism had an effect in a general sense. First, after World War II there was a sense of renewal and expansion in cities and also innovation in use of materials that were originally intended for use in the war. Then there were two different paths of modernism, one following the European Bauhaus teachings that led to the international style and then the path led by Frank Lloyd Wright that focused on integration with nature and local materials. This is evidenced by the difference in the characteristics of the Farnsworth House and Glass house and Falling Water and the Eames house, all considered great works of modernism.

2.4 Norman Rice Contributor(s): Rose D., Alex J.

Rice was born in Philadelphia in 1903, and graduated from the University of Pennsylvania with a Bachelors in Architecture in 1924.[6] While studying at Penn, Rice met Louis Kahn, and the two worked together closely at several firms in Philadelphia. Rice worked with architects such as Paul Cret, John Molitor (where he and Kahn worked on the Sesquicentennial Exposition in 1926), Zantzinger, Borie & Medary and Tilden, and Register & Pepper.[7] "Disillusioned [and] inclined to quit architecture", Rice left the United States "eager to see great European buildings everyone imitated" in 1928, and became the first American to work in the offices of Le Corbusier in France.[8] Upon his return to Philadelphia in 1931, Rice joined Howe & Lescaze during the seminal PSFS Building project (Loews Philadelphia Hotel). This monumental structure became the first modern skyscraper.

After gaining experience from other well-known Philadelphia architects, Rice established an independent practice in the city in 1932.[9] In 1952, he designed the case study house 3421 W Schoolhouse Lane and used many of the “modern home” ideals gained from Corbusier. From 1953 to 1959 Norman Rice taught at the Philadelphia Museum School of Art before returning to UPenn to teach alongside Kahn from 1963 to 1977.[10] He was also very accomplished in terms of his organization connections; he served as Philadelphia Chapter AIA director from 1953 - 1955/1962 - 1963, vice president from 1958 - 1959, and president from 1960 - 1961.[11] Rice was named to the Philadelphia State Art Commission in 1971 and remained on until the 1980’s when he passed away in 1985.[12]

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[6] Athenaeum of Philadelphia--Norman Rice. Accessed May 11, 2020. http://www.philaathenaeum.org/pastexhibitions.html.
[7] Ibid.
[8] Ibid.
[9] Ibid.
[10] Ibid.
[11] Ibid.
[12] Ibid.

2.5 The Rothners Contributor(s): Alan D., Jessica R.

Jacoby T. Rothner

Dr. Jacoby T. Rothner was born in Brooklyn, New York in 1902 to Russian-born father Joseph H. Rothner and New York-born mother Fay L. Rothner. He was educated at Philadelphia Dental College and graduated in 1925, entering the practice in 1931. He helped organize the periodontology department of Temple University's Dentistry School, which was one of the first in the Eastern United States, and joined the faculty of Temple University's Dentistry School as a professor of periodontology in 1936, later becoming Chair of Periodontia in 1946.[13] Dr. Rothner consistently produced academic papers from 1926 to 1977 and became Philadelphia's first specialist in the treatment of tissues supporting the teeth. Additionally, he developed a set of periodontal instruments used in the practice in 1940 that were later redesigned in 1941 and 1947.[14]

Dr. Rothner's presence in the dentistry field continued far past his academic achievements, gaining him positions as President, board member, fellow, etc. in more than twelve dentistry associations, societies, and academies, some of the most notable of which are the Philadelphia Chapter of Omicron Kappa Upsilon honorary dental society (President, 1941), the International College of Dentists (Fellow), and the Philadelphia, Pennsylvania, and American Dental Associations (Member).[15] He additionally served as a consultant to the Veterans Administration, the Army, and hospitals in the Philadelphia area after retiring from World War II service in 1962 as Major.[16]

On May 5, 1980 Dr. Jacoby T. Rothner passed away in Hahnemann Hospital at age 77.[17]

Leah M. (Margolis) Rothner

Leah M. Margolis was born on March 10, 1904 to Olga Margolis from Poland and Louis Margolis from Russia.[18] After marrying Dr. Jacoby T. Rothner, she became very involved in the Philadelphia Chapter of the Brandeis University National Women's Committee. She was a nominee for Vice President and held various posts in her membership and other chapter

[13] "J. T. Rothner, Dental Professor." *Philadelphia Inquirer*, May 8, 1980, sec. Obituaries.
[14] Ibid.
[15] Ibid.
[16] Ibid.
[17] "Rothner." *Philadelphia Inquirer*, May 7, 1980, sec. Obituaries.
[18] "Margolis." *Philadelphia Inquirer,* May 21, 1976, sec. Obituaries.

activities.[19] Eventually, she became an active member with the Brandeis University Library as well, but passed away on May 18, 1976.[20]

Leah and Dr. Jacoby T. Rothner are survived by two daughters, Phyllis R. Kirson and Doris R. Horowitz, and six grandchildren.

2.6 Owner Timeline Contributor(s): Talcia B., Jessica R.

1948: Dr. Jacoby T. and Leah M. Rothner purchased the land at 3421 W. Schoolhouse Lane from Alma H. Morani and built the Rothner Residence.

1961: Mr. Jack F. Gordon purchased the property and house for $31,500.

1966: Alfred C. and Dorothy L. Laboccetta purchased the property and house for $50,000.

2007: William and Christina Winston purchased the property and house for $390,000.

2009: Paul D. Welde and Janet K. Grace purchased the property and house for $426,000.

2015: Janet K. Grace became the sole owner of the property after Paul D. Welde relinquished his claim to the property.

2.7 Building Chronology Contributor(s): Jessica R.

1951: The Rothner Residence finished construction at 3421 W. Schoolhouse Lane as a single family house with an attached garage.

1964: Mr. Jack F. Gordon added an inground pool (20' x 47') and a 4' high fence around the property. These additions were approximately $3,500.

1974: The attached garage was converted into a bedroom/bathroom suite and a single-car detached garage was constructed to the southwest of the house. The driveway was modified to accommodate the new garage addition.

Prior to 2007: The detached garage was expanded by 250 square feet to its south side, and a second entrance was added to the detached garage expansion. The driveway was modified again to accommodate the new garage entrance.

[19] "Brandeis Unit Sets Election." *Philadelphia Inquirer,* April 5, 1959, sec. Social.
[20] "Margolis." *Philadelphia Inquirer.*

2009: The second entrance to the detached garage was filled in with concrete block, thereby reverting the entry into the garage back to the 1974 condition. The driveway was modified a third time to reflect the 1974 condition.

3.0 Existing Conditions

3.1 Introduction Contributor(s): Adam H.

Chapter 3 observes the existing conditions of the Rothner Residence looking at the existing documentation, character defining features, description of the interior and exterior, and materials used. The information collected in this section concludes with a statement of significance which will inform the philosophy for any proposed changes to the property. Majority of the information from this section derives from on-site observations, backed up with research and the existing documentation.

3.2 Existing Documentation Contributor(s): Adam H.

Existing documentation for the Rothner Residence is intermediate. A majority of the existing information was provided by the current owner, Janet Grace. Ms. Grace herself compiled a lengthy amount of information on Norman Rice, the home's construction, and kept a detailed record of any renovations she made over her years as the owner. A relevant document to mention is the Historic Building Nomination prepared by Ms. Grace to the Philadelphia Historical Commission.

The Historic Building Nomination includes several valuable pieces of information including a series of photographs and drawings of the building, a timeline of site modifications, and a general description of the organization. The nomination does not provide any architectural drawings that are to scale or with significant detail. To construct a consistent set of drawings the team conducted a survey (see appendix A.) While Norman Rice is a recognizable name for successful Philadelphia architects. He is not well documented or researched.

3.3 Character Defining Features Contributor(s): Adam H.

The character defining features of the Rothner Residence include:

- The Mid-Century Modern style features a lack of ornamentation and the use of manufactured and modular construction materials such as CMU block and aluminum windows.
- The division of entertaining, utility, and private spaces;
- The private facade of the home is represented through the contrast between the opening sizes of the south (street facing) and north (backyard facing) elevations.

- The emphasis of horizontality through the horizontal windows and the filing of any vertical masonry courses, emphasizing the horizontal courses.

3.4 Building Description Contributor(s): Adam H.

Exterior Description

The Rothner Residence is oriented southeast. The surrounding area is primarily residential to the north, southwest, and west. Across Schoolhouse Lane, to the east, is the Ravenhill Campus of Thomas Jefferson University East Falls. From the street, the residence has a private appearance with only a p presence of the detached garage. The majority of the facade is veiled by a variety of coniferous shrubs and trees. Two granite gate posts define the driveway of the property.

The Rothner Residence is a single story, concrete masonry block building. The form in plan is an almost equal proportined L-shape with a rectangular garage to the south. The house features a butterfly roof while the garage has a shed roof. The garage is oriented northeast and is the first visible structure upon approach. The northeast elevation of the garage is inline with the southeast elevation of the house. The entrance of the house is in the inner corner of the L on the southeast elevation. Including the south wing of the L, the residence is four bays wide and approximately three bays deep. A chimney is located on the roof, slightly southwest of the inner corner and the main entrance.

The style of the Rothner Residence is Mid-Century Modern featuring simple geometries and a manufactured modular construction. Ornamentation is found through the house's form and strong horizontal features. Extended eaves emphasize the plane of the roof. Vertical course lines are hidden to draw out the horizontal lines in the masonry. The majority of the house is white with the southeast face of the south wing painted gray and a vibrant red along the northeast face leading to the entrance.

Rice added privacy from Schoolhouse Lane with smaller openings on the southeast elevation while the northwest elevation features larger openings to the backyard. Glass block creates a unique design in the southeast elevation of the garage and the red northeast face of the south wing. Aluminum windows infill the majority of the openings relating to the interior program with various scales. The primary programs of the house (dining room, living room, office, and master bedroom) line the northwest elevation opening to the back of the property.

The landscape to the north features a terrace along the northwest elevation and a sloping landscape. A rectangular pool with curved short ends is positioned with the long sides parallel to the northwest house elevation. A fence defines the property line of the site. A

series of garnes scatter the landscape. No evidence existing documentation shows Norman Rice influenced the landscape design.

Interior Description

The interior of the Rothner Residence is divided into three distinct areas. In the inner and outer corners of the L is the entrance and the entertaining spaces (living and dining rooms.) Private spaces like the office, bedrooms, and bathrooms are in the north wing. Utility spaces like the kitchen, laundry, and original garage, now den, is in the south wing.Throughout the home key features highlight the interior such as cypress paneling and built-in shelving. According to the documentation from Ms. Grace, a large variety of repairs and renovations over the past ten years, the most significant, the replacement of asbestos tile floors with slate.

Entrance and Entertaining Spaces

Upon entrance of the front door, there is a small foyer with that doors into three areas, to the northeast (right), a mudroom; to the southwest (left), the den/original garage; and to the north (forward) is the living room. A glass door bordered by two sidelites opens serves as a barrier between the foyer and the living room. Between the foyer and living room is a small landing with access to a coat closet to the northeast, the landing has three steps down into the living room.

Entering into the living room the space expands in volume and visually to the landscape with the northwest elevation of glass. Directly to the northwest is a random ashlar fireplace which is the focal point of the entertaining spaces and the house as a whole. A central hearth is a common Mid-Century Modern feature popular with Frank Lloyd Wright and other well known architects of the time. The northeast wall features a warm cypress paneling running vertically to create juxtaposition with the horizontality of the windows. A door hidden in the paneling leads into the office while a clear squared arch opens to the bedroom corridor of the north wing. A common feature in Norman Rice's interiors is high natural lighting, a rendition of this in the Rohtner Residence is the soffit lighting above the northwest window of the living room. Under the windows of the living room is a set of low built-in shelves.

The living room is open to the dining room to the southwest which is slightly smaller. A storm door opens to the exterior terrace of the northwest elevation. The southeast elevation features a doorway and small 24"x12" opening into the kitchen. The division between the kitchen and dining room is a key feature to the Rothner Residence in terms of the division between entertaining and utility spaces.

Utility Spaces

The utility spaces of the Rothner Residence are in the south wing of the house's L. The utility spaces are divided into two areas, the den/original garage and the kitchen and laundry area. Presumably, the original garage was sealed off when the detached garage was built. The current owner, Janet Grace is utilizing this space as a den with an en-suite bathroom. The only entrance of the den is off of the foyer. The existing den features a textured wall finishing on the southwest elevation and unknown flooring. A small passage to the southeast of the room leads to the en-suite bathroom.

The dining room connects to the kitchen. The kitchen is U-shaped along the northwest, southwest, and southeast elevations. The northeast elevation has a door into a utility room. The cabinets in the kitchen are original metal cabinets. Above the sink on the southwest face is a set of three aluminum windows. Opposite the dining room entrance there is a square archway into the laundry room. The laundry room has access to the exterior on the southwest elevation with a door flanked by two double hung windows. The northeast elevation has a door into another mechanical room where the furnace and hot water heater are stored.

Private Spaces

The north wing of the Rothner Residence houses the private spaces, including the office, master bedroom and bathroom, guest bedroom, guest bathroom, and bar/original dark room. All private spaces are accessible from the corridor except for the office which is accessed through the northeast elevation of the living room. The office walls are all paneled with the same cypress as the living room. Built-in shelves on the southeast elevation are opposite the windows of the northwest elevation.

From the passage between the living room and corridor, a northwest doorway opens into the original darkroom, another room repurposed. This time into a small bar. The wall finishes include blue glass tile. Across the corridor on the southeast elevation is a closet with sliding doors. Toward the end of the corridor, are the doors into the guest bedroom to the southeast, guest bathroom directly ahead, and the master bedroom to the northwest. The guest bedroom has openings on the southeast and northeast elevations and a closet in the southwest elevation. The guest bathroom features a frosted pane window on the northeast elevation.

The master bedroom expands similar to the foyer to the living room with an increase in volume and light with a wall of windows on the northwest elevation. A closet is located on

the southwest wall upon entry while the bathroom entrance juts in slightly on the southeast elevation.

3.5 Materials Used

Wood and Doors Contributor(s): Rose D., Riley G., Srinthi J., Jessica R., Spencer R.

Particle Board and Masonite

Particle board was a popular material from the Mid-Century Modern movement due to its affordability and sleek design. It is made from compressed wood shavings and usually has a wood veneer applied to give it the look of a natural material.[21] It is used in furniture, doors and as a construction material making it extremely versatile and is why it was so popular and used so often in Mid Century Modern homes.[22] It is however susceptible to moisture and humidity which means it has the tendency for its veneer to peel off and in extreme circumstances lose portions of its compressed wood construction.[23] Masonite is a brand of particle board created by William H. Mason in 1924 and began to dominate the market for many years. In 1972 Masonite started to manufacture doors and door materials and became a staple in door manufacturing.[24]

Oriented Strand Board (OSB)

Oriented Strand Board was conceptually invented and patented in 1965 by Armin Elmendorf.[25] It is made up of alternating layers of wood strands that are compressed with adhesive and is used as a structural particleboard for exterior appliances such as wall construction and doors.[26] If protective materials surrounding the OSB are installed incorrectly, moisture can cause the edges of the board to swell permanently and deform.[27]

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[21] "Mid-Century Modern Furniture (i) : Particle-Board." working by hand, August 2, 2016. https://workingbyhand.wordpress.com/2016/07/26/mid-century-furniture-i-particle-board/
[22] Ibid,.
[23] "What Is Particleboard?" International Timber, February 20, 2019. https://www.internationaltimber.com/what-is-particleboard/.
[24] "The History of Masonite," Masonite (Masonite International Corporation, n.d.), https://web.archive.org/web/20111020213919/http://www.masonite.com/masonite_history.php.
[25] Zerbe, John I, Zhiyong Cai, and George B Harpole. "An Evolutionary History of Oriented Strandboard (OSB)," United States Department of Agriculture, February 2015.
[26] Ibid.
[27] "Choosing Between Oriented Strandboard and Plywood: Building and Construction Technology: UMass Amherst." Building and Construction Technology. Accessed April 21, 2020. https://bct.eco.umass.edu/publications/articles/choosing-between-oriented-strandboard-and-plywood/.

Oil-Based Paint

Oil-Based paint was a popular exterior application in the 1920's to 1960's, especially in home construction due to its smoothness, glossiness, dirt-resistance, and hardness.[28] Over time, however, oil-based paints lose their elasticity and can crack, check, or peel due to aging when the substrate expands and contracts or moves. These conditions can also occur in oil-based paints if they are applied over a substrate that was poorly prepped, wet or dirty. If the outermost layer of paint is a latex-based paint and is applied over an oil-based that was not first primed, incompatibility can occur between the layers and cause the latex-based paint to crack in the same way that the oil-based paint is underneath.[29]

Nickel-Plated Handset

Nickel-plated handsets were very popular in the early modern movement. The style that is very common was developed by Ferdinand Kramer, a Bauhaus and functionalist designer in the 1920s and 30s. One of the projects he worked on was the New Frankfurt project which was a public housing program started in the 1920s. Kramer designed various aspects of the project, which included hardware. He designed a nickel-plated door knob which became very popular and used in various international modern styles.[30] However, nickel-plated knobs when put in contact with moisture wear the nickel plating off, exposing whatever metal is underneath.

Windows and Doors Contributor(s): Alison E., Adam H., Alex J., Grace M.

Pittsburgh Corning Glass Block

Corning Glass Works and Pittsburgh Plate Glass Company formed the Pittsburgh Corning Glass Block Company in 1937. In 1947 FOAMGLAS insulated glass blocks were developed.[31] In the Rothner Residence the 8"x8" Argus Perpendicular Pattern (first manufactured in 1938) was used, see Figure 3.1. Glass block manufacturers are still in process today and

[28] Baker, Thomas. "All About Exterior Paint." This Old House. This Old House, April 11, 2012. https://www.thisoldhouse.com/painting/21017905/all-about-exterior-paint.
[29] Formisano, Bob. "Here Are the Top 10 Exterior Paint Problems, and How to Fix Them." The Spruce. Accessed April 22, 2020. https://www.thespruce.com/top-exterior-paint-problems-1824712.
[30] "Ferdinand (Carl) (August Friedrich) Kramer." archINFORM. Accessed January 11, 2020. https://www.archinform.net/arch/797.htm
[31] Strand, Tara. "Pittsburgh Corning." Mesothelioma.ccom. https://www.mesothelioma.com/asbestos-exposure/companies/pittsburgh-corning/

replacement blocks are readily obtainable, although the addition of the pattern, if no longer in print, could be custom matched.

Fig. 3.1: 8x8 Glass Block

Aluminum Windows & Doors

The original windows in the house were manufactured by Cupples Aluminum Windows, and the replacement windows were manufactured by Thermador. Cupples was established in St. Louis, Missouri in 1946 and closed in 1994. The company was renowned for innovative advancements in glass fabrication as well as the fabrication of custom designs. Aluminum windows are well known for lightweight, easily installable windows, and Cupples later became known for the fabrication of glass facades. Some of the custom fabrications included work for I.M. Pei, SOM, and Yamasaki for the World Trade Center. Cupples offered Multiple standard shape and sized windows that were mass produced for ease of production and readily available for purchase. The windows ranged from different styles of windows as well as operable and inoperable windows, see Figure 3.2. Aluminum windows are a rust resistant window option that were available in varying sizes, gauges, finishes, and offered different coatings to be applied to the windows. The windows were believed to be an easy to install, low maintenance option for windows. The construction of windows offered was a screw assembly style, as well as a wielded or mitered option. Aluminum windows also offered both screen and storm inserts for insulation or circulation purposes. One Aluminum screen door was also installed off of the dining room door Figure 3.3. While the manufacturer is unknown It is of the same material and construction type of the windows.

Figure 3.2: Image of Aluminum window # 5 and Figure 3.3: Aluminum Door off Dining Room.

Masonry and Hardscaping Contributor(s): Helen P., Talcia B., Alan D.

Concrete Masonry Units (CMU)

Concrete masonry units are popular in a wide range of projects, from residential to educational to commercial and industrial. These units are manufactured using a mixture of concrete placed in mold, vibrated compacted and removed from the mold after it has dried well enough to hold its shape, after this time the product is cured in a curing chamber. After this process is complete they are prepared to be shipped to their varying destinations.[32] Concrete masonry units bring a wide range of advantages to any product, often the first to be mentioned is the fact that it is a non-combustible material. Added to this the product is durable, it adds thermal mass to any project to maintain uniform temperatures throughout a space. Concrete masonry units are modular products, with the most common size being nominal 8” tall by 8” deep and 16” wide and units are held together using mortar. If reinforcement is needed, they can be placed in horizontal and/or vertical cavities. This added reinforcement helps the wall to carry live and dead load from the building, as well as any additional forces that may act on them.[33]

Elastomeric Paint

[32] “Concrete Masonry Units,” *PCA America’s Cement Manufacturers.,* Accessed April 21, 2020, https://www.cement.org/cement-concrete-applications/products/concrete-masonry-units
[33] “Concrete Masonry Units,” *International Masonry Institute,* Accessed April 20, 2020, https://imiweb.org/concrete-masonry-units/

Elastomeric Pain is a high build coating that is specifically designed to protect masonry surfaces. Adding a coat of elastomeric paint to a masonry surface can protect it from wind driven rain, and act as a low-grade weatherproofing system, if correctly applied. However if used incorrectly or under the wrong circumstances these coatings can cause more harm than good.[34] Elastomeric paints are 10 times thicker than a regular coat of paint. It can be used to repair sizable cracks in stucco and is sometimes used as an alternative to replacing the stucco on a masonry building. The material is water tight and bendable. Due to the fact that this material requires an expert painter to apply it to a project, it can often become a costly endeavor. It is at times applied to handle movement in masonry unit walls, that would otherwise cause cracking.[35] If the product is not applied correctly, it will cause the finished surface to appear bumpy which can lead to cracking in the material. A solution to this problem would be to hire an expert painter to do the job. Likewise if there are multiple layers of paint already on your stucco it is not advised to add elastomeric paint to that surface. Elastomeric paint is a high build product as such it weighs more than the typical paint. If the coating underneath the elastomeric paint is not tight enough, the substrate could pull away from the stucco with the weight of the elastomeric paint.[36] The house's current coating is the Sonneborn Chemflex elastomeric coating.

Parging

A parge coat is a cementitious mortar applied to concrete masonry units in order to refine the surface. Parging is often applied to the surface using a trowel and pressed into the existing surface. Often the intent when using this technique is to create a more refined surface by filing in the imperfections, which could include surface voids, leveling the surface for visually pleasing reasons or to prepare for a topcoat of some kind. Parging is considered a low-cost alternative to repointing. The product also helps to protect the masonry unit, and can be whitewashed as a finish.[37] Though parging can prevent water from travelling through a wall, it is not an effective waterproofing method.[38]

Mechanical, Electrical, and Plumbing Systems

Mechanical

The Rothner Residence was originally heated by a unique system and did not originally have air conditioning. Historically, the entire house was heated by an underfloor hydronic

[34] "When to use Elastomeric Paint on Stucco," CertaPro Painters, Accessed May 05, 2020, https://certapro.com/bryn-mawr/elastomeric-paint-stucco/.
[35] "Ask The Family Handyman." *Reader's Digest.* The Reader's Digest Association, Inc: New York. (1999): 146-147
[36] Jason Parker, "Pros & Cons for Elastomeric Paint," *Professional Painting Knowledge Base: Better Information, Better Decisions,* Performance Painting Contractors Inc., https://www.performance-painting.com/blog/the-pros-cons-for-elastomeric-paint.
[37] Jeff, "What is Parging Anyway?" Home Improvement, Parging, *Coating Parging Experts, (*July 7, 2014.)
[38] Paul Briggs, "Mortars and Finishes," *Old House Journal* 19, no. 4 (Jul-Aug 1991): 37.

radiant heat system. Today, half of the existing hydronic system has failed in the easternmost portion of the house and hot-water baseboard radiators were added to compensate for the loss of the heat source. According to the owner and resident, Janet Grace, she keeps the house at about 60 degrees Fahrenheit year-round.[39]

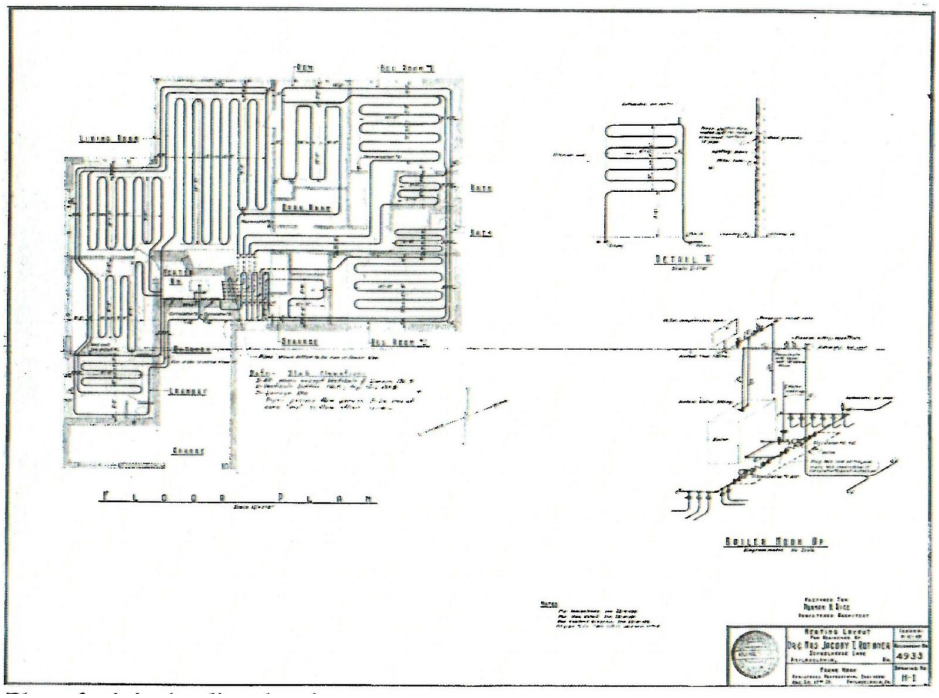


Fig 3.4: Original underfloor hydronic radiant heat system plans.[40]

Hydronic underfloor radiant heat systems were commonly used in Mid-Century Modern homes. The first Americans to popularize radiant floor systems were Frank Llyod Wright and Levittown designers and occupants. Frank Lloyd Wright was the first to popularize radiant heat systems, calling his system “gravity heat”, which included a boiler in the basement that heated copper pipes that went through the floor slab above it. Homes in Levittowns even used heated slabs. Levittown homes were constructed quickly with a slab-on-grade foundation that could be adapted into a radiant heat system. During the 1940s and 1950s, the American radiant industry was booming with the promotion of copper, wrought iron, and steel piping for underfloor systems, even installing heated driveways and sidewalks for

[39] Janet Grace, interviewed by Alison Eberhardt. April 15, 2020.

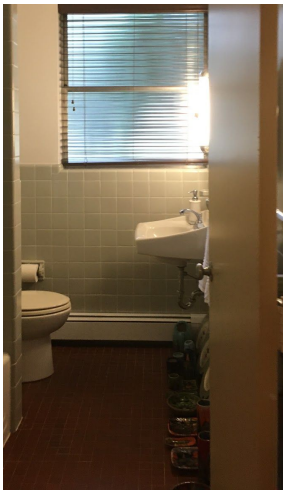
[40] Janet Grace, Nomination of Historic Building, 3421 W. Schoolhouse Lane (Philadelphia Historical Commission, 2010).

snow melting. However, most of these experimental systems failed within fifteen or twenty years, due to the metal piping.[41]

Electrical

The building is serviced by PECO for its electricity. The electricity is used for electric overhead lighting, task fixtures, and appliances, including the two air conditioning units added by Janet Grace.[42]





(L-R) Fig. 3.5: Lounge AC unit. Fig. 3.6: Water heater and gas boiler. Fig. 3.7: Baseboard radiator.

Plumbing

The Rothner Residence is supplied by City of Philadelphia water. Hot water is heated by a water heater, powered by a Crown gas boiler; both appliances were installed in 2019. The hot water heater also heats the underfloor hydronic radiant heat system and baseboard radiators, as discussed previously.

There are a total of six sinks, three toilets, and three showers in the building. The toilets and shower heads were replaced by low-flow, water-efficient fixtures in 2009.

[41] Steve Smith and Jack Sweet, "A Brief History of Radiant Heating, Radiant & Hydronics", published June 1, 2006, https://www.pmmag.com/articles/91874-a-brief-history-of-radiant-heating.
[42] Interview with Janet Grace, 2020.

3.6 Statement of Significance Contributor(s): Jessica R.

The Rothner Residence was constructed and completed as a single family residence with an attached garage for Dr, Jacoby T. Rothner and Mrs. Leah M. (Margolis) Rothner in 1951 after the land was bought in 1948 from Alma H. Morani. Since its completion, the building has retained its use as a residence, but has passed ownership five times and endured multiple alterations to its original design and footprint. These physical changes, however did not affect the integrity of the building's historic fabric as a modernist house. Its historical significance lies in its non-disrupted preservation as an example of modernist architecture in East Falls, Pennsylvania.

The period of significance for the Rothner Residence spans from the start of the house's construction in 1948 to the end of the Rothners' ownership of the property in 1961 when it was sold to Mr. Jack F. Gordon. Maintaining the design of the house during this period best preserves its connection to the modernist movement that was emerging in the East Falls area during the 1950s. In the periods of ownership following that of the Rothners, the essence of governing modernist principles was still present in the house, but were not as closely connected to the context of the overarching time period.

4.0 Conditions Assessment

4.1 Masonry and Site Paving Contributor(s): Helen P., Talcia B., Alan D.

CMU and Coatings

The house and the garage are made of CMU block coated with several coatings. The garage uses 12” x 16” CMU blocks and the house uses 8” x 16” brown CMU blocks . The coatings are as follows: brownish CMU block, a stucco coating with greenish aggregate, a white paint, and an elastomeric white coating. The coatings are generally in good condition, but there are many areas where repairs are evident especially by the openings of windows (see Fig. 4.1). Some are active but a majority of them are repaired and stable. There seems to be no method to allow the wall to expand and contract and so this may be why at the openings, which are the weakest points of the wall, cracks are appearing. There is also peeling coating by the retaining wall in the rear with green staining (see Fig. 4.2). The staining pattern and the flatness of the stain is indicative of algae. With the conduit there, it may act as a surface that catches water and directs it towards the wall. This area is also well shaded by trees and foliage that line the edge of the property and so that creates a suitable environment for the algae to grow.

Fig. 4.1: Repaired crack on west elevation; Fig. 4.2: Algae on south elevation retaining wall.

Hardscaping

The hardscaping is made of three different periods of masonry and then the asphalt. The front walkway, the area by the garage and laundry room door, and part of the walkway to the pool use concrete. The flagstone, which is made of schist, covers about half of the patio on the west side and the steps to the pool (Fig. 4.3). And the bluestone square pavers cover the other half of the patio and also make up the area around the garage door and create the path down to the pool on the west elevation (Fig. 4.4). The asphalt only exists on the front side of the house. The concrete is generally fair, although the concrete ramp is cracked and the front walkway is weathered from site runoff as evidenced by the exposed aggregate and discoloration (Fig. 4.5). The cracking of the ramp may be due to settlement of the ramp itself, detaching it from the garage. The flagstone is a little displaced and there is some need to it in between and the pavers face the same issues, with some cracking involved.

(L-R): Fig. 4.3: Flagstone on the west side; Fig. 4.4: Square schist pavers on the south side; Fig. 4.5: Crack on concrete ramp on west elevation of the garage.

Drainage

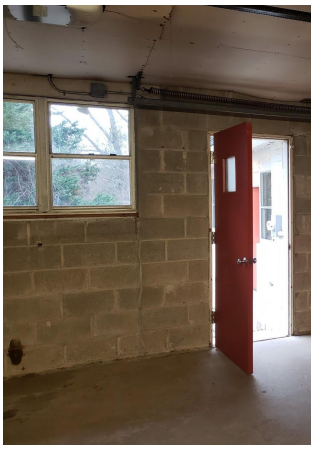
The site drainage consists of three different components: downspouts, a drainage grate, and areas of gravel which we assume is to help with drainage. There is one visible downspout where the roof slopes meet on the west elevation with three other locations for downspout openings on corners of the house, but with no downspout (Fig. 4.6). Though to help, there is drainage gravel near these areas where the house is susceptible to water

draining on the site, specifically on the east elevation (Fig. 4.7). And there is also the drainage grate in the middle of the driveway, adding additional drainage help.

(L-R): Fig. 4.6: The only downspout located on the south elevation; Fig. 4.7: South corner of garage without downspout.

Garage

The garage has the same construction and almost the same coatings as the house. It has a parging coat that is different in its color and appearance. Clearly the addition uses similar materials, but because it was added later, the materials are not exactly the same which may cause problems relating to thermal movement due to differing material expansion and contraction. The largest of the active cracks is located on the west elevation of the garage (Fig. 4.8). The location aligns with the extension of the garage which may be related to difference in material movement like mentioned earlier or the attachment to cold joints between the old and new materials. There is also an active crack which is underneath the only window of the garage (Fig. 4.9). It is visible both inside and outside indicating ongoing movement. This may be caused by the lack of a downspout on the nearby corner causing water to constantly hit that area, making it more compressed than the surrounding soil.



(L-R): Fig. 4.8: Active crack on the east elevation of the garage; Fig. 4.9: View of crack below window of garage.

4.2 Wood and Doors Contributor(s): Rose D., Riley G., Srinthi J., Jessica R., Spencer R.

Garage

Garage Door

The garage door is made of an oriented strand board (OSB) base with dimensional lumber used as paneling trim. The OSB is covered with white paint that is cracking and peeling across the entire surface. In many places, the OSB is clearly visible behind the paint where pieces of peeling paint have completely come off. Behind some of the paint surrounding these exposed areas, there appears to be mold growth between the paint and the OSB substrate (Fig. 4.10). This alerts that moisture is entering this gap behind the paint and is left to sit, which could potentially lead to moisture damage of the OSB if left untreated. It is unclear whether the peeling paint on the garage door is from an incompatibility between an older oil-based paint and a newer latex-based paint or from it still being the original oil-based paint that has lost its elasticity over time as the OSB substrate expands and contracts in heat.

(L-R) Fig. 4.10: Exposure of OSB behind peeling paint. Fig. 4.11: Garage door trim peeling from wall.

Garage Door Trim

The trim surrounding the garage door is made of dimensional lumber, possibly 1”x4” and is seen to be peeling away from the wall of the garage (Fig. 4.11). This could possibly be due to moisture traveling down from the trim above, potentially from a small leak in the roof assembly. However, further investigation would have to be made to clarify that cause.

Garage Door Header

The header above the garage door is made from plywood, which is seen in the presence of the plugs in what were knots in the wood during manufacturing (Fig. 4.12).[43] The white paint coating the header is cracking in the direction of the wood grain, which is either caused by paint incompatibility if there are new and old layers of paint, or elasticity loss if the paint is the original oil-based paint. Plywood is susceptible to warping due to changes in moisture within the wood as well as expansion and contraction, which could also be a large factor in the cracking of the paint.

[43] “Cracking - Plywood Checking - Sherwin-Williams.” Sherwin. Accessed April 19, 2020. https://www.sherwin-williams.com/homeowners/how-to/problem-solver/peeling-cracking/SW-ARTICLE-DIR-CRACKINGPLY

Fig. 4.12: Peeling paint on garage door header.

South Red Door

The red door leading to the backyard is made of particle board and has multiple layers of paint, including a medium gray, a dark gray, and finally the red that is currently seen on the door. There is a square window at the top of the door about a quarter of the way down that is made from a clear plastic with ridges running horizontally. There is deterioration at the bottom of the door in the form of cracking paint and a deteriorating corner, where the veneer and paint have both peeled away to expose the fibrous inner layers of the door (Fig. 4.13). It is speculated that the cause of this deterioration is due to water runoff from the driveway, the result of a potentially-clogged drain.

The jamb of the red door is made from dimensional lumber and is painted white. The door currently closes with the help of a closer, but is slightly off-kilter within the frame, causing a jarring action when left to freely close. This is causing the jamb on the hinged side of the door to pull from the CMU wall of the adjacent garage and for the door to sit askew and not close completely (Fig. 4.14).

(L-R) Fig. 4.13: Peeling paint at bottom of red door. Fig. 4.14: Jamb of red door pulling from CMU wall..

House

Panels Above Windows and Doors

Above all of the windows and doors on the house and garage are panels made of plywood coated with white paint. On all of these panels, though at different degrees, the paint is peeling in the same manner. The peeling is most severe on the panels above the windows and doors on the west elevation, but should also be noted on the north elevations of the house and the garage (Fig. 4.15). It is believed that the peeling is worse on the west elevation of the house because it receives the most direct sunlight in the evening hours of the day, which is able to shine directly on the panels under the overhang. The heat from the sun causes the wood to expand, thereby causing the paint to expand as well and crack. The paint currently on the panels could be the original oil-based paint; however, more investigation will need to be done to confirm this to determine whether the layer behind the peeling paint is another paint layer or the substrate itself. If it is another layer of paint, the cause of the peeling would be paint incompatibility between the original oil-based paint and a newer layer of latex-based paint. If not primed properly before applying, the latex-based paint can crack in the same way as the oil-based paint underneath it as it loses its elasticity over time.[44] If what is seen under the peeling paint is the substrate, the current paint layer would be the original oil-based paint.

[44] "Why Does Exterior Paint Peel?" House Painting Guide. Accessed April 21, 2020. http://www.housepaintingguide.org/why-does-exterior-paint-peel/.

Fig. 4.15: Most severe peeling paint on the window and door panels of the west elevation.

Column on North Elevation

The columns at the corners of the windows of the living room on the north elevation are made from dimensional lumber, possibly 3” x 3” posts, and are coated with a white paint. There is cracking seen in the paint running in the same direction as the grain of the wood underneath (Fig. 4.16). The cracking of the paint here can be caused by similar situations as explained above in the window and door panel description: incompatible paint layers or aging original oil-based paint.

Fig. 4.16: Corner column on north elevation with cracking paint.

4.3 Windows and Doors Contributor(s): Alison E., Adam H., Alex J., Grace M.

House

Almost all of the windows are prefabricated A200 series aluminum windows manufactured by Cupples Aluminum Corporation. There are a combination of double-hung and fixed windows at varying scales (see Figure 4.17). Glass storm windows are mechanically attached to the window frame with screws, making them inoperable. Pull tabs on the storm windows suggest they were originally removable and could be replaced with a screen.

Fig. 4.17 Both operable and inoperable windows.

Overall the windows on the house are in fair condition. There are areas of deterioration present in the sealants for most of the original windows, but collectively they are performing adequately. A black glazing compound is present between the fixed and double-hung windows, which has dried up and is beginning to crack and flake away (see Figure 4.18). A few windows on the house have had recent repairs with sealant replacement and pane replacement. General cleaning to all windows is being done by the current owner with the use of aluminum jelly or phosphoric acid jelly. The owner is using this product to remove oxidation which has formed on the aluminum frames. Several of the panes of glass have sustained cracks. Further investigations should be performed to ensure the integrity of the window is not compromised.

Fig. 4.18 Showing cracked gasket between frames.

Garage

The main windows on the garage match those on the house, but are newer. These are the only aluminum frame windows on the building which are not covered by a storm window. These windows are overall dirtier than those on the house, and there is an abandoned mud wasp nest located in the exterior track of one of the windows. There are also 8”x8” Argus Perpendicular Pattern Corning Glass blocks on the street-facing elevation of the garage, which are in excellent condition, besides some cosmetic smearing of mortar from the adjacent masonry (see Figure 4.19).

Fig. 4.19 Showing Glass Block in garage.

4.4 Mechanical, Electrical, and Plumbing Systems Contributor(s): Alison E.

Mechanical

Historically, the house was heated by an underfloor hydronic radiant heat system, which is partially operational today. Hot-water baseboard radiators were added to compensate for the loss of the heat and both of the systems are in good condition.

Electrical

The building is serviced by PECO for its electricity and, from photographs, all lights and electric appliances seemed to be in good condition.

Plumbing

The Rothner Residence is supplied by City of Philadelphia water. The water heater and Crown gas boiler are both in good condition, having been installed in 2019.

5.0 Treatment Recommendations

5.1 Treatment Philosophy Contributor(s): Grace M.

The Secretary of the Interiors' Standards for the Treatment of Historic Properties defines preservation as:

The act of or process of applying measures necessary to sustain the existing form, integrity, and materials of a historic property, generally focused on the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment, however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code required work to make the property functional is appropriate within a preservation project.

The Secretary of the Interior has also defined four levels of treatment for historic resources: preservation, rehabilitation, restoration, and reconstruction.

- The *preservation* standards apply to processes, measures, or work on a historic resource intended to sustain it in its present form.
- The *rehabilitation* standards generally apply to work done to adapt a historic resource to a compatible new use, or uses, without losing the character-defining elements which convey its historical, cultural, and aesthetic value.
- The *restoration* standards apply to processes, or work on a historic resource intended to return it to its form and appearance of a specific time period, or era, defined as the period of significance of the resource.
- The *reconstruction* standards apply to the replication or reconstruction of lost resources, or portions thereof, with new construction.

Preservation is the most relevant level of treatment for the property, as much of the original historical fabric remains. *Restoration* has occurred through much of the work done by the current owner, Janet Grace. This work has largely addressed any issues which were potentially hazardous or demonstrated a particular need for restoration. The preservation of the remaining historic fabric and restoration of any further deteriorated elements are the two most relevant levels of treatment for the site and house.

Consistent with that standard, the treatment approach for the extant Rothner Residence and its associated site should conform to the following principles:

- Elimination or minimization of all conditions and practices which adversely affect, or reduce the service life of surviving historic fabric
- Establish maintenance cycles and practices that increase the longevity of existing historic fabric
- Design and execute all building interventions in a manner that most closely approximates the appearance of the period of significance without replicating original design flaws or introducing new flaws that will diminish or damage the extant building fabric
- Design and execute all system upgrades with the intention to reduce replacement cycles and cumulative damage to the building fabric

5.2 List of Treatments Contributor(s): Alan D, Helen P, Talcia B.

Masonry

High Priority

- Shore and adjust foundation in areas of severe and progressing settlement
- Repoint all live cracks which aren't caused by settlement
- Lintels above windows inspected for expansion
- Pavement redone where cracking
- Gaps and uneven pattern

Medium Priority

- Exterior stone paving
- Schist stone re-lain with proper settling aggregate layers
- Rubber pellets removed
- Mortar repointed on schist

Low Priority

- Add expansion joints below window sills
- Holes in rear elevation repointed and painted
- Exterior elevations washed and repainted where chipped
- Loose stone pavers re-aligned

Wood and Doors

High Priority

- The south door jamb either must be removed or re-faceted to the CMU.

Medium Priority

- The garage trims and headers should have a Medium Density Overlay adhered to the face of the plywood to reduce checking.
- The surface of the garage door should be prepper, primed, and repainted with a latex-based paint. If the OSB behind has not had its wax coating sanded, that should be done as well before priming and repainting.
- The soffit on the garage and main house should be patched with wood to reduce moisture from running down the walls.
- The south red door should be replaced and an aluminum door sweep should be installed to prevent moisture from making contact with the Masonite. The closer above the door should also be repaired to prevent the door from jarring when closing and pulling the jamb from the CMU wall of the garage.
- The surface of the laundry room door should be prepped, primed, and repainted with a latex-based paint.
- The panels above the windows and doors should be prepped, primed, and repainted with a latex-based paint.

Low Priority

- The window sills on the garage and house can be prepped, primed, and repainted with a latex-based paint.
- The aluminum storm door on the west elevation should be re-adjusted so that it does not bear against the ground.

Windows and Doors

High Priority

- None required

Medium Priority

- Replace deteriorated window gaskets

- Replace cracked window panes to reduce air infiltration and risk of further damage

Low Priority

- Remove storm windows to clean debris away from original windows
- Acquire and replace storm windows with screens during the appropriate seasons, if desired

Mechanical, Electrical, and Plumbing Systems

The systems of the house are in overall good condition, despite the loss of half of the historic radiant floor system. According to the Secretary of the Interior's Standards, the original HVAC systems of a building should be maintained and repaired where possible. If the system is unable to be reinstalled, the system should be replaced with a comparable replacement.[45] Hot water baseboard radiators tie into the existing system well with minimal destruction of existing historic fabric. Although a modern radiant floor system is a closer replacement to the original hydronic system, installation of such a system would require more damage to historic interior finishes. The existing systems of the house have been added in a sensitive manner, with the exception of the air conditioning unit installed in the Lounge (former Garage), which is visible from the front approach of the house.

High Priority

- None required.

Medium Priority

- None required.

Low Priority

- Annual homeowner checks and maintenance.
- Make a plan to repair or reinstall the total-house radiant floor system.
- Consider removing the air conditioning unit in the Lounge (former Garage) wall to preserve historic exterior appearance. A ductless mini-split air conditioner mounted on the wall could provide suitable cooling with less effect on the exterior of the building.

[45] "The Secretary of the Interior's Standards", National Parks Service, accessed May 11, 2020, https://www.nps.gov/tps/standards.htm.

5.3 Timeline of Treatment Philosophy Contributor(s): Grace M.

The following proposed action plans organize most of the higher priority interventions into groups of related and complementary tasks that could be used to define the scope of work for future projects. In general, high priority items appear early in the timeline, while low priority and maintenance items appear later; but where it may be efficient to perform some lower priority actions at the same time as higher priority work, some items may appear earlier.

Within 1-3 years:

- Repoint all live cracks which aren't caused by settlement
- Inspect lintels above windows for expansion
- The south door jamb either must be removed or re-faceted to the CMU.
- Replace cracked window panes to reduce air infiltration and risk of further damage

Within 3-5 years:

- Pavement redone where cracking
- The garage trims and headers should have a Medium Density Overlay adhered to the face of the plywood to reduce checking.
- The surface of the garage door should be prepper, primed, and repainted with a latex-based paint. If the OSB behind has not had its wax coating sanded, that should be done as well before priming and repainting.
- The soffit on the garage and main house should be patched with wood to reduce moisture from running down the walls.
- The south red door should be replaced and an aluminum door sweep should be installed to prevent moisture from making contact with the Masonite. The closer above the door should also be repaired to prevent the door from jarring when closing and pulling the jamb from the CMU wall of the garage.
- Replace deteriorated window gaskets
- The surface of the laundry room door should be prepped, primed, and repainted with a latex-based paint.
- The panels above the windows and doors should be prepped, primed, and repainted with a latex-based paint.
- Exterior stone paving
- Schist stone re-lain with proper settling aggregate layers
- Rubber pellets removed

- Mortar repointed on schist

Within 5+ years:

- The window sills on the garage and house can be prepped, primed, and repainted with a latex-based paint.
- The aluminum storm door on the west elevation should be re-adjusted so that it does not bear against the ground.
- Remove storm windows to clean debris away from original windows
- Acquire and replace storm windows with screens during the appropriate seasons, if desired
- Add expansion joints below window sills
- Holes in rear elevation repointed and painted
- Exterior elevations washed and repainted where chipped
- Loose stone pavers re-aligned

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Appendices

Appendix A: Existing Drawings

Appendix B: Conditions Assessment Drawings

Appendix C: Individual Project Proposals

Norman Rice's Approach to Site, Talcia Brown

Influences of Norman Rice, Rose Davis

Proposal for TJU Learning Hub, Riley Gardiner

Guidelines for Interior Rehabilitation, Adam Hoover

Norman Rice's Design Ideologies, Srinithi Jaganathan

Storm Panel Study, Alex Jones

Glass Block Analysis, Helen Phan

Butterfly Roof Study, Jessica Radomski

Energy Audit and Sustainability Study, Alison Eberhardt

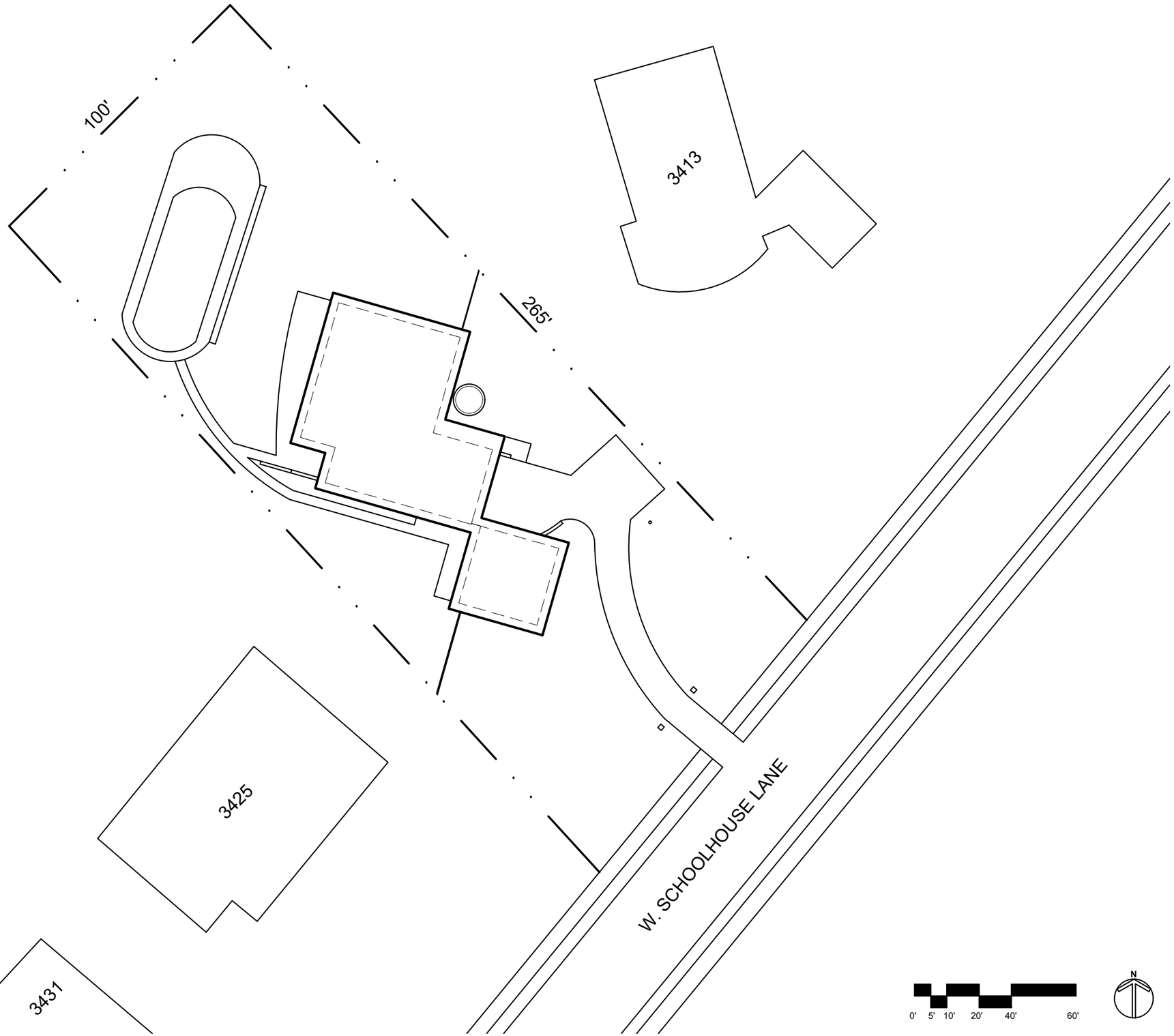
Maintenance Plan, Grace Messner

Addition Management Plan, Alan Davidson

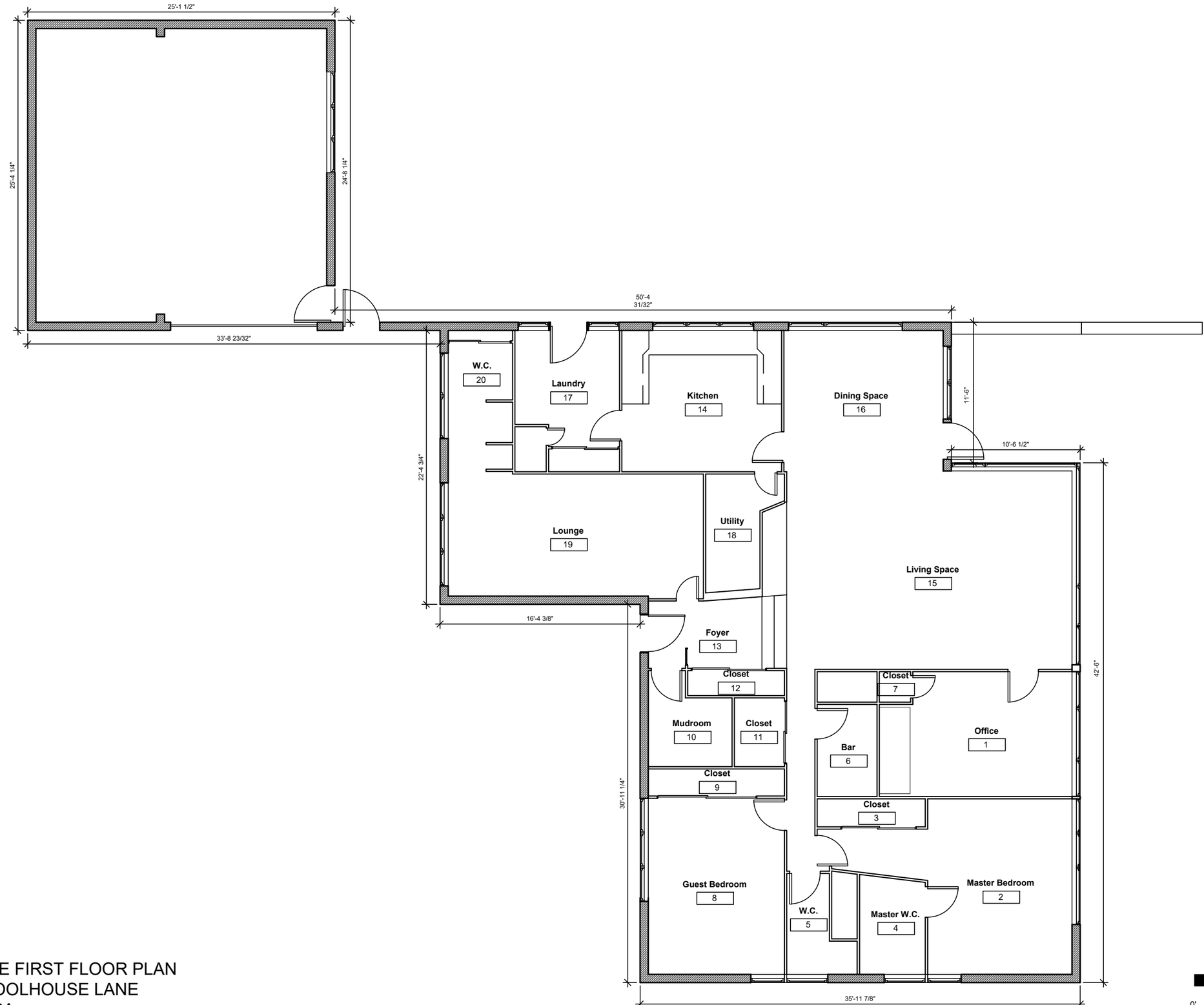
Addition Designs, Spencer Rubino

Appendix A

Existing Drawings



ROTHNER HOUSE SITE PLAN
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA



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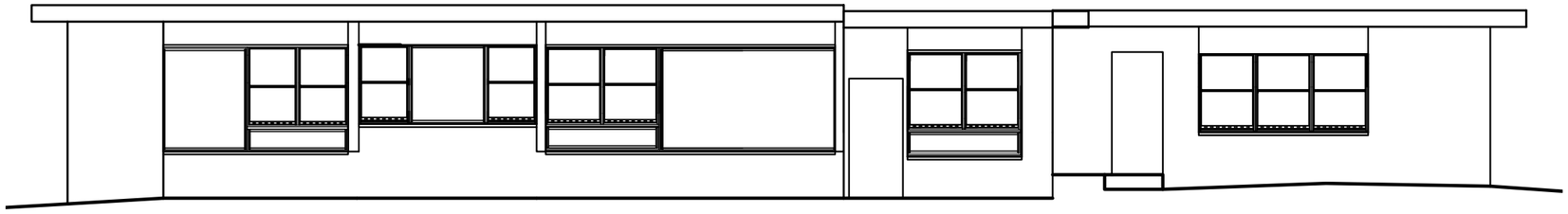

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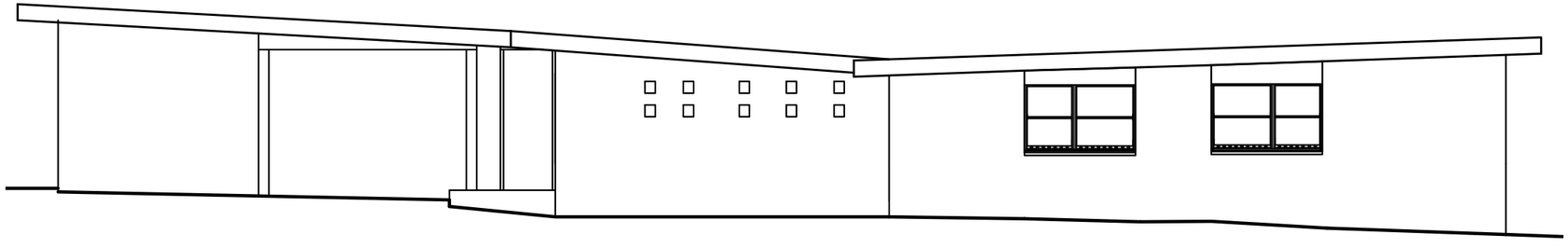

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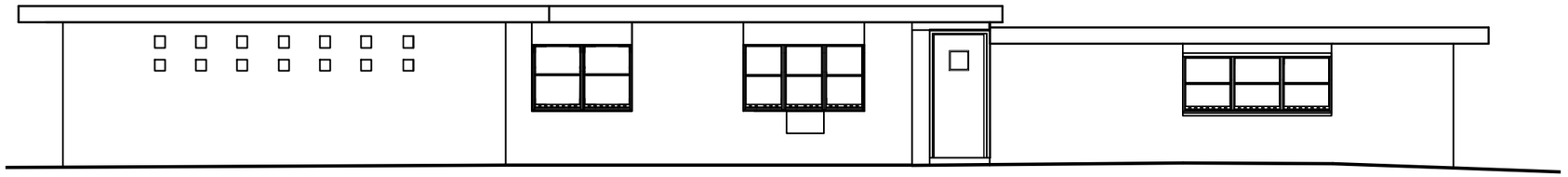

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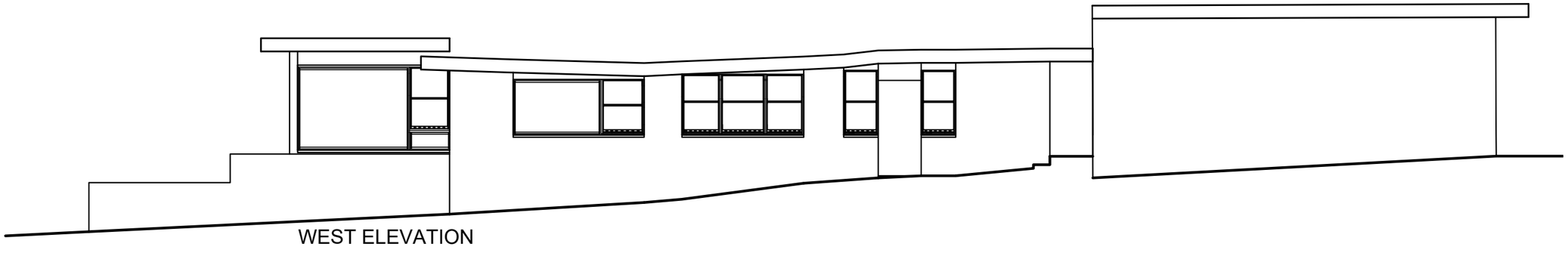

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ROTHNER HOUSE EXTERIOR ELEVATIONS
3419 - 3421 SCHOOLHOUSE LANE
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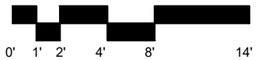

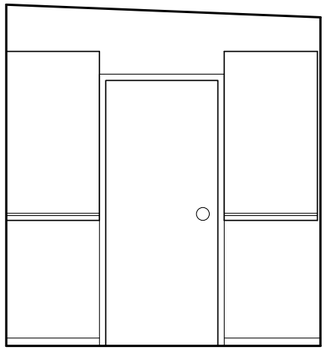

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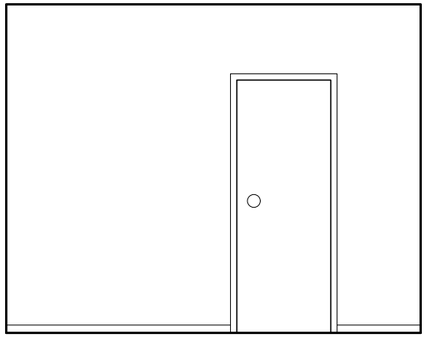
LAUNDRY ROOM



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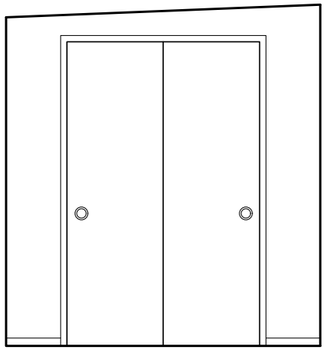

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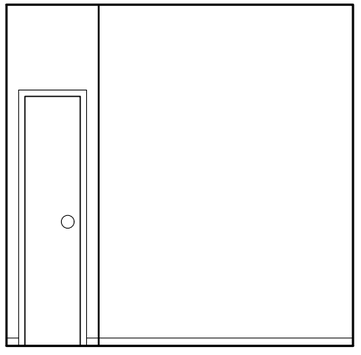

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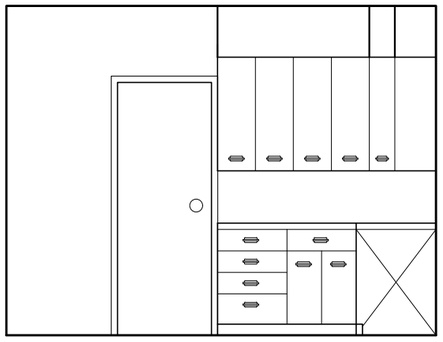
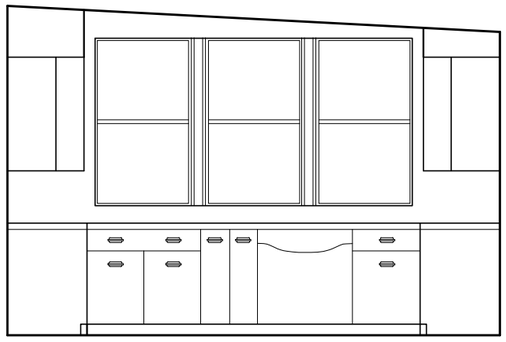


SOUTH ELEVATION
KITCHEN



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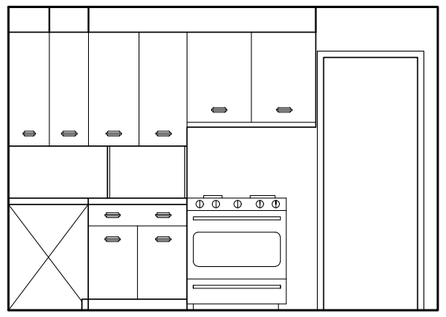

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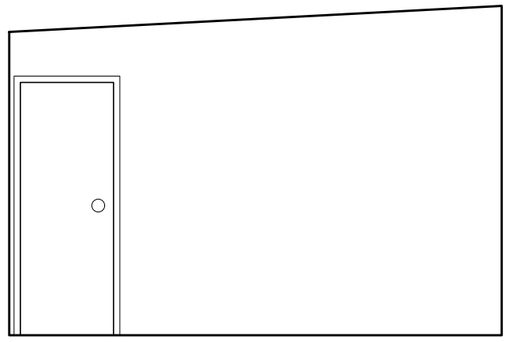
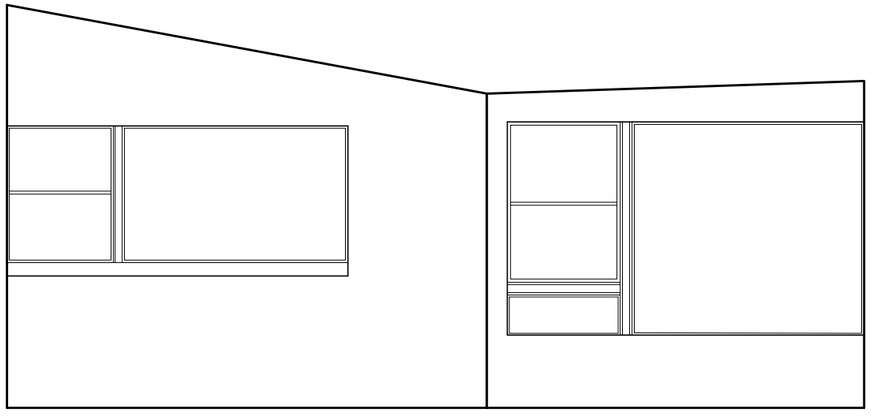


EAST ELEVATION

ROTHNER HOUSE INTERIOR ELEVATIONS
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA



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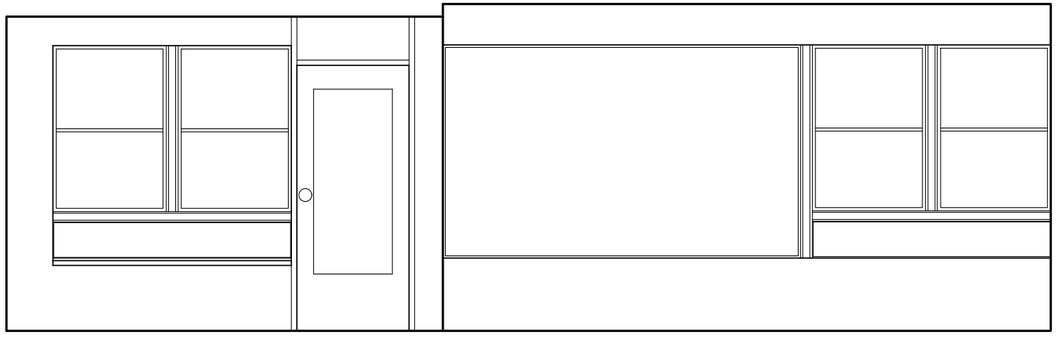
DINING / LIVING ROOM



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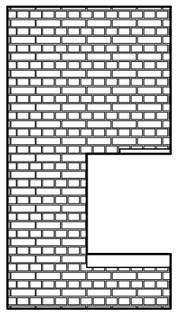

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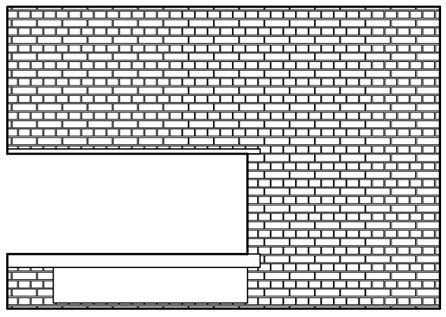
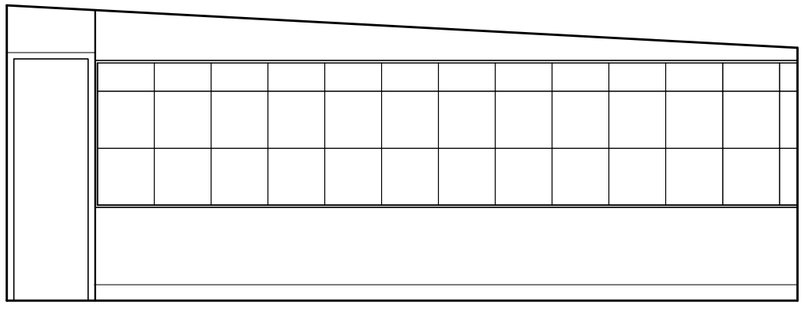


NORTH ELEVATION

ROTHNER HOUSE INTERIOR ELEVATIONS
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA



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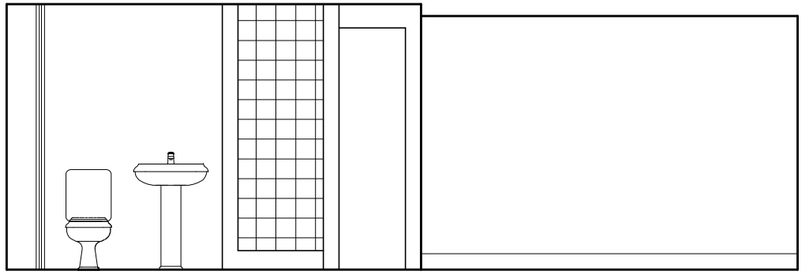
LOUNGE



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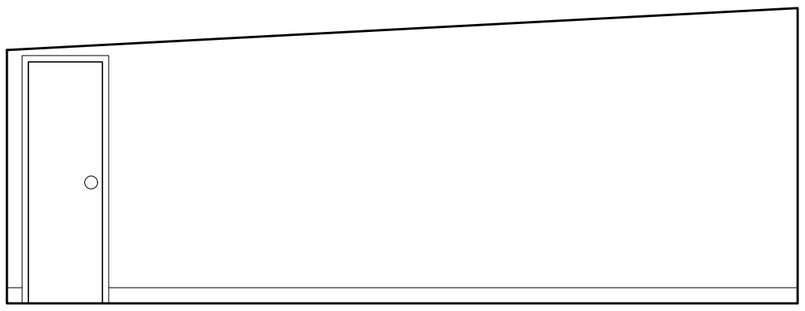

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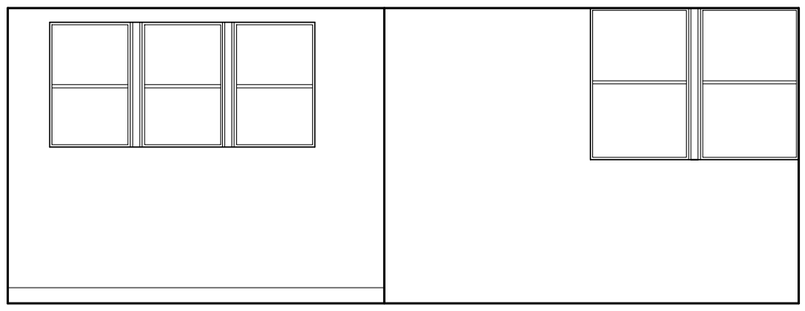
LOUNGE



SOUTH ELEVATION

ROTHNER HOUSE INTERIOR ELEVATIONS
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA

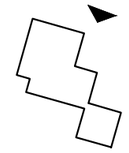
Appendix B

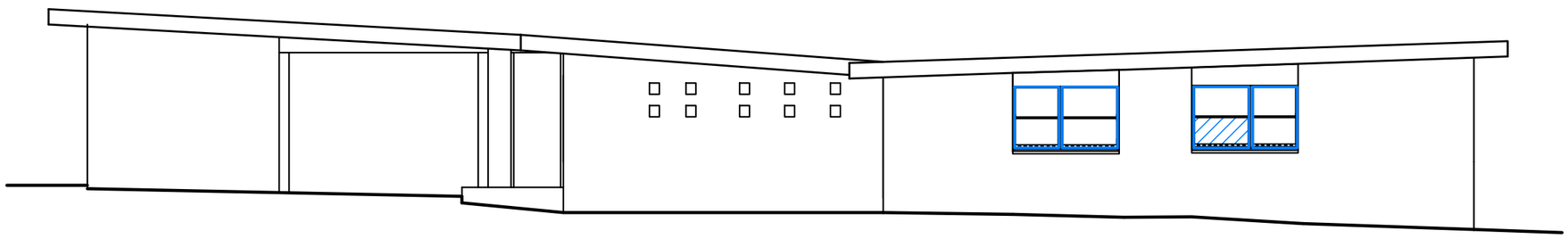
Condition Assessment Drawings

KEY

- CRACKED WINDOW PANES
- MISSING OR DAMAGED GASKETS
- REPLACED WINDOW
- REPLACED SEALANT
- MASONRY CONCERNS
- (LIST HERE)
- WOOD CONCERNS
- (LIST HERE)

KEY PLAN





ROTHNER HOUSE CONDITIONS DRAWINGS
EAST ELEVATION
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA

0' 1' 2' 4' 8' 14'

KEY

CRACKED WINDOW PANES

MISSING OR DAMAGED GASKETS

REPLACED WINDOW

REPLACED SEALANT

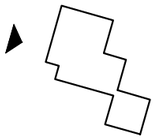
MASONRY CONCERNS

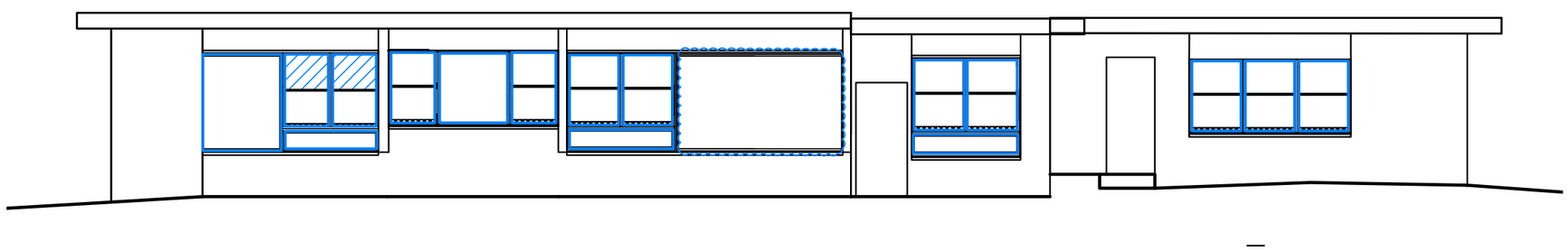
(LIST HERE)

WOOD CONCERNS

(LIST HERE)

KEY PLAN





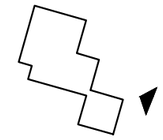
ROTHNER HOUSE CONDITIONS DRAWINGS
NORTH ELEVATION
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA

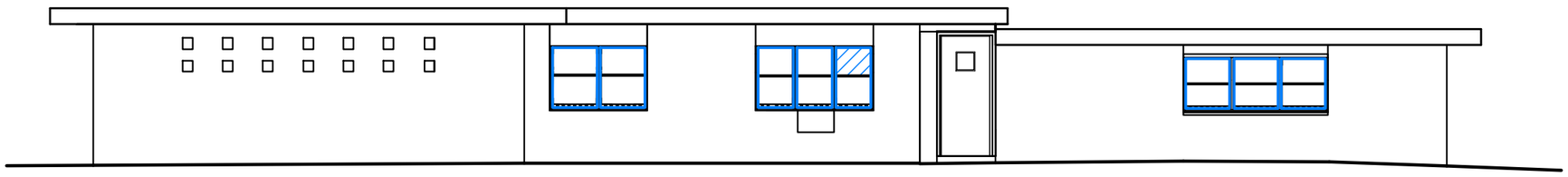
0' 1' 2' 4' 8' 14'

KEY

- CRACKED WINDOW PANES
- MISSING OR DAMAGED GASKETS
- REPLACED WINDOW
- REPLACED SEALANT
- MASONRY CONCERNS
- (LIST HERE)
- WOOD CONCERNS
- (LIST HERE)

KEY PLAN





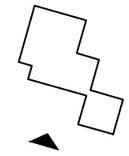
ROTHNER HOUSE CONDITIONS DRAWINGS
SOUTH ELEVATION
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA

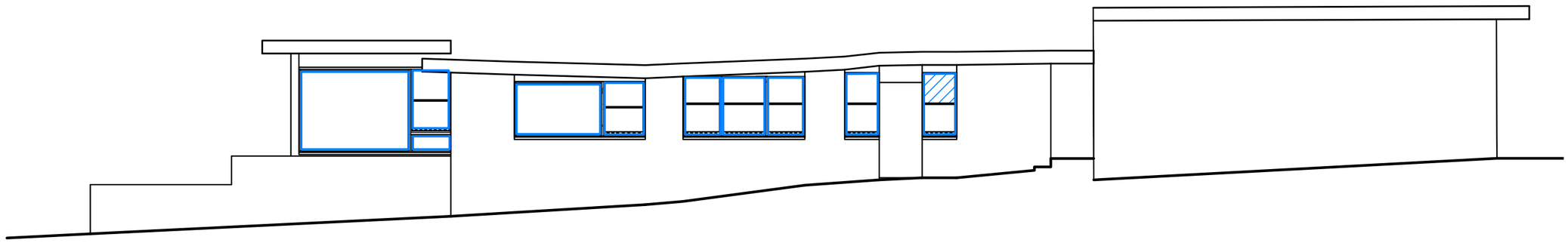
0' 1' 2' 4' 8' 14'

KEY

- CRACKED WINDOW PANES
- MISSING OR DAMAGED GASKETS
- REPLACED WINDOW
- REPLACED SEALANT
- MASONRY CONCERNS
- (LIST HERE)
- WOOD CONCERNS
- (LIST HERE)

KEY PLAN





ROTHNER HOUSE CONDITIONS DRAWINGS
WEST ELEVATION
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA

0' 1' 2' 4' 8' 14'

Appendix C

Individual Projects

Rothner Residence

Norman Rice's Approach to the Site

Talcia Brown

11th May, 2020

Introduction

There can be no doubt that Norman N. Rice... This report attempts to compare three suburban residences to determine if the architect had a particular style when it came to the layout of his site. Also being compared are the Oser and Esherick Residences by Louis Kahn and Frank Lloyd Wright's Jacob First Residence, a Usonian home. The report tries to answer the question, does Norman Rice's suburban residential projects siting fit what is considered stereotypical of modern architecture or is this something that was unique to Rice? Using images collected and analyzed literature to conclude how the site development was influenced by its surroundings.

Frank Lloyd Wright' Usonia 1

The Jacob Residence also known as Jacobs One at was built in 1937 by architect Frank Lloyd Wright as the first of Usonian homes. Dubbed, "the house America needs," by the architect the Usonian home model was to be an affordable home design, intended to cost approximately five thousand dollars (approximately eighty thousand dollars today) to build. The home was built on a rather public residential street in Madison, Wisconsin.[1] Wright's approach to the site was to provide the family privacy from onlookers by creating what appeared to be a wooden wall, appearing as though the house was turning its back on the roadway. He created no significant setbacks from the sidewalk and made no attempts to hide the home from view. On the other side of the house however there were expansive window openings that look out to nature. The house was designed for its occupant to enjoy and was not intended as something to use to show off to neighbors. As such the open nature in the rear of the home is for them to enjoy.[2]

[1] Wisconcin Historical Society, Jacobs Residence, Image IM37812, https://www.wisconsinhistory.org/Records/Image/IM37812.
[2] Avery Trufelman, "Usonia 1," *99 Percent Invisible,* February 07, 2017, https://99percentinvisible.org/episode/usonia-1/.

Figure 1. Usonia 1 built in 1937 by Frank Lloyd Wright, front facade

Figure 2. Image showing the rear elevation of the Jacob's Residence

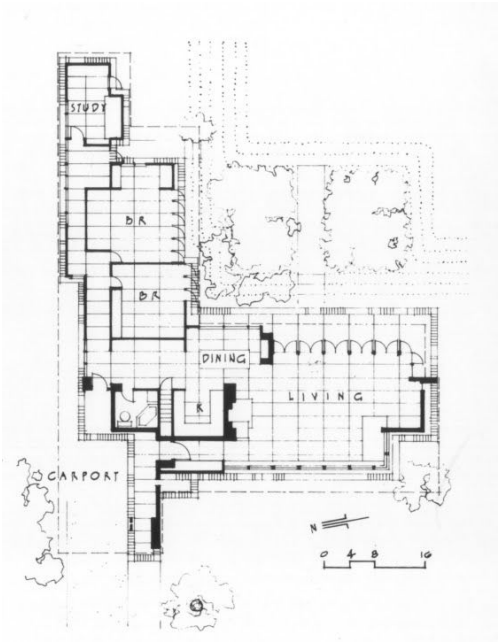


Figure 3. Site plan of the Jacob's reisdence as designed by Frank Lloyd Wright

Louis Kahn Residences

The Oser house located in Melrose Park, Montgomery County, Pennsylvania, was commissioned by Jesse and Ruth Oser in 1940. The home was designed by Louis Kahn as one his first residential project, and was completed in 1943. It is safe to say that this residence illustrates features that were later developed further by Kahn and

implemented in varying projects that became indicative of his particular aesthetic style.[3] The home does not seem to have the approach to privacy on the front façade as would be seen in later residences by Louis Kahn. In comparison to the level of fenestration in the rear of the building it could be argued that it had been considered. The rear of the building once again opens and frames a beautiful view of the nature that surrounds the building. In this way these views become something that is safe for the owner of the home to view and share with guests as he/she sees fit.

Figure 4. Front Facade of the Oser Residence as designed by Louis Kahn in 1940

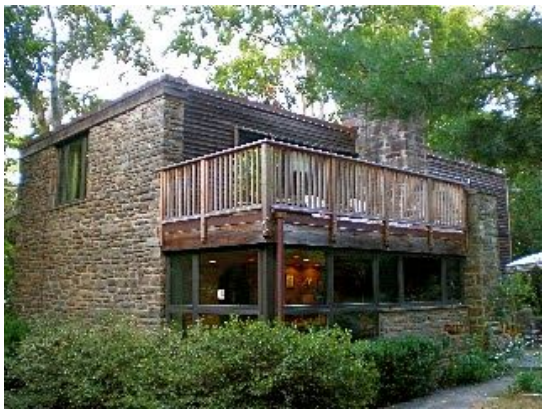


Figure 5. Rear elevation of the Oser Residence.

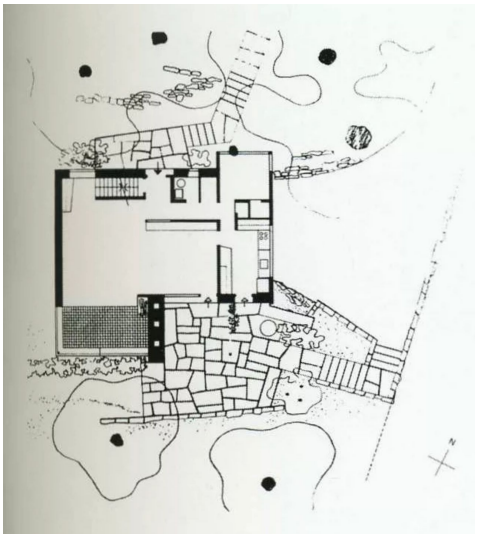


Figure 6. Site plan of the Oser Residence.

The Esherick House was designed by Louis Kahn in the year 1959, commissioned Margaret Esherick, the niece of the famous Philadelphian sculptor Wharton Esherick. The

[3] "Louis Isadore Kahn, FAIA (1901-1974)," US Modernist, accessed April 15, 2020, https://usmodernist.org/lkahn.htm

home is located in Chestnut Hill, Philadelphia and is a true testament to Kahn's principles on simple geometry, light and materiality.[4] This residence, situated on a half-acre lot, was received by critics as a wonderful alternative to the International Style glass box that was seemingly becoming prevalent at the time. Kahn's approach to the building site was similar to that of Wright's, there was no attempt made to hide the building from the street but instead privacy was allotted to homeowners through the use of a lower level of fenestration of the building front façade. Once again, in the rear of the building there were expanses of glass that overlooked nature that was private to the owner of the home.[5]

Figure 7. Front elevation of the Esherick home designed by Louis Kahn in 1959

Figure 8. Back of the home created for Margaret Esherick

[4] "Title sheet and floor plans – Margaret Esherick House, 204 Sunrise Lane, Philadelphia, Philadelphia County, PA," Drawing from Survey HABS PA-6775, Library of Congress, https://www.loc.gov/resource/hhh.pa4101.sheet/?sp=1.
[5] Rose Etherington, "Esherick House by Louis Kahn, *Dezeen,* April 03, 2008, https://www.dezeen.com/2008/04/03/esherick-house-by-louis-kahn/.

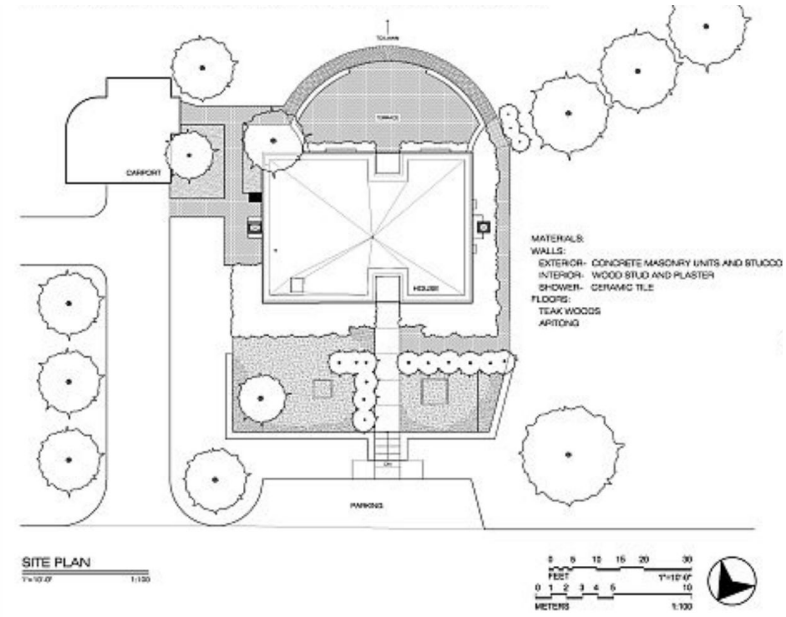


Figure 9. Site plan of the Esherick Residence in Chestnut Hill

Norman Rice Residences

In 1940 Norman Rice completed a home in Elkins Park that had been commissioned by Stanley and Janice Berenstain, the famous cartoonists. Much of the home's original features had been restored but several upgrades have been made over time. Materials or elements that had degraded beyond repair, such as the roof and windows have since been replaced. At this property Rice created a space filled with light on its interior that served as the home for Berenstains and their family.[6] The architect set the home well back from the property's boundaries and angled it ever so slightly in relation to the street to avoid any direct views of the neighboring properties. This move also allowed for the living spaces to be flooded with light from their southern exposure. In 1951 at the Exhibit of the Philadelphia Chapter AIA., the home was awarded the Home Builders' Association award as, "the most distinguished suburban house by a Philadelphia

[6] Melissa Romero, "Elkins Park midcentury modern asks $425K after top to bottom restoration," *Curbed Philadelphia,* (October 12,2017), https://philly.curbed.com/2017/10/12/16458998/elkins-park-home-for-sale-modern.

architect."[7] Much like his counterparts, the amount of opening on the front façade and the rear elevation was significantly different, giving the family a private view of their backyard space.

Figure 10. Front of the Berenstain Residence designed by Rice in 1940

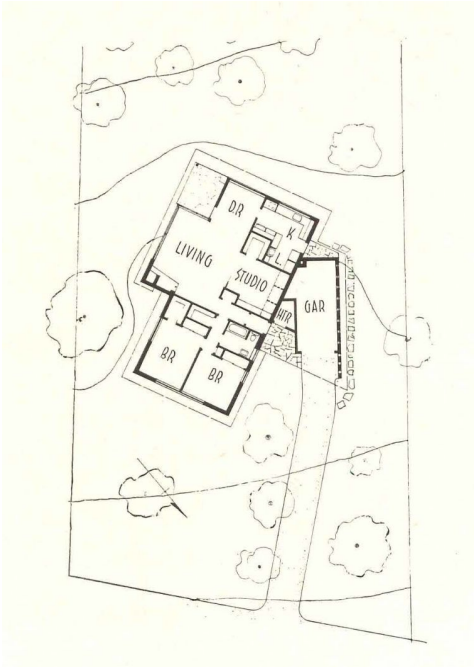


Figure 11. Site plan as designed by Rice.

In a home designed by Rice later in his career, in 1950, along Dekalb Pike in Montgomery County, Pennsylvania Rice appeared to have taken a similar approach siting of the building. In a bird's eye view provided by Google Maps the home appears to be set back from the street several feet. However, this is something that can be seen as being done in several homes that surround the one designed by Rice. It can be said that this was common practice on homes this far away from the city, as well as homes that are found along major roadways. It is unclear if Rice took these design measures simply because of

[7] "Home for Cartoonists' Family," *Architectural Record,* (May 1952): 143-144.

the aforementioned reasons or if it was because it had become his style over the years. However, this building has not been angled from the street.

Figure 12. Scheifler Residence on Dekalb Pike designed in 1950

Figure 13. Bird's eye view of Scheifler Residence

The Rothner Residence completed in 1949, designed by Norman Rice for the Jacoby family. The home sits on West School House Lane, in Philadelphia. In this home rice seems to have taken the same approach that was taken at the Berenstain residence. The home has been angled from the street and has a significant setback from the home's property boundaries. The home is somewhat obscured from view from the street. Likewise, the home has significantly more window openings in its rear elevation than in its front façade. On the rear elevation the windows look out onto the properties backyard that is private to the inhabitants of the home and his/her guest.

Figure 14. Front of the Rothner residence completed in 1949 by Norman Rice.

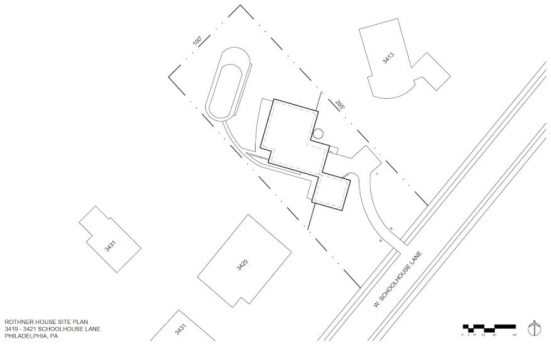


Figure 15. Site plan of the Rothner Residence commissioned by Dr & Mrs. Jacoby Rothner.

Conclusion

Rice certainly seems to have a specific style when it came to siting his building in his suburban projects. However, the placement of his suburban residential buildings do have some similarities to his modernist counterparts, Frank Lloyd Wright and Louis Kahn, with some differences in their approach to privacy. Norman N. Rice's suburban homes appeared to have been placed strategically on the site to provide the inhabitants with added privacy. It is also likely that this was done to be sympathetic to the traditional building that often surrounded them. Several of the projects were previously landscaped with trees around the site to add more privacy to these homes.

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Rothner Residence

The Influences of Norman Rice

Rose Davis

11th May, 2020

Introduction

To get a better sense of why Norman Rice designed the house the way he did, this report delves into the many people and styles that may have influenced the architects design choices. Rice was taught by Paul Cret—a man known for his education and subsequent architectural career in the Beaux-Arts style of architecture, which originated in France. The fact that the Rothner Residence diverges so far from the main style utilized so commonly only one generation before it was built begs the question of where it deviated, and what were the factors that caused the split? This report will also look at some of Rice's contemporaries to see if they paralleled his modern style, or if they stayed true to the Beaux-Arts style of their teachers. Finally, this report will observe and analyze the remnants of the Beaux-Arts within the modern style, in addition to the obvious differences.

For a brief overview of the order in which the Beaux-Arts were taught in France, and subsequently became mid-century modern homes in Philadelphia, a "family tree" is shown below (Fig. 1). This diagram is meant to illustrate who was a teacher to Rice, and who branched off at the same time to create similar designs in America. Norman Rice and Louis Kahn were taught alongside architects such as Alfred Easton Poor, Charles I. Barber, and Edwin A. Kimble at the University of Pennsylvania. Kahn and Rice became most notable for their modernist designs despite being taught by Paul Phillipe Cret—an architect known to be the enemy of the modernist. Cret, however, followed in the footsteps of his Beaux-Arts teacher, Jean-Louis Pascal, who also studied at the École des Beaux-Arts (Fig. 2) in the early 1860's.

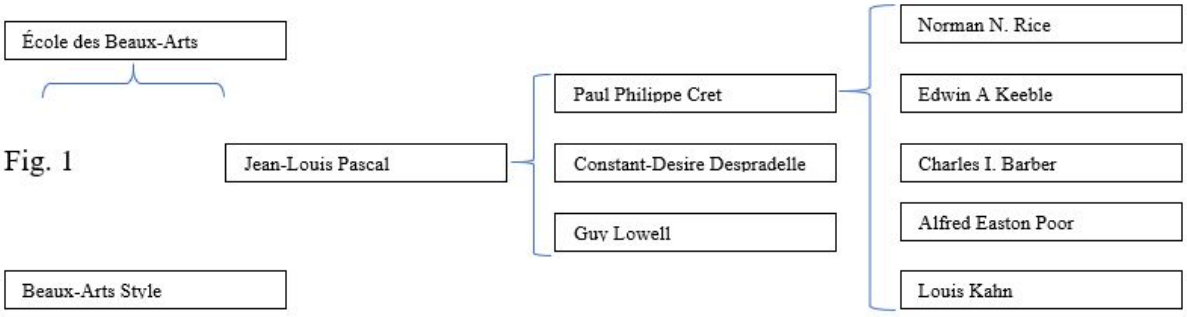

Fig. 1

Beaux-Arts

The Beaux-Arts style was modeled on classical “antiquities” and allowed the idealized forms of European past to be preserved and taught in institutions such as the École des Beaux-Arts. The school was created and founded by an Italian Cardinal with the purpose of educating the most artistically talented students in drawing, painting, sculpture, architecture, and other media. Although the style originated in France, it was carried over to America in the 19th century by architects who attended the school. The style is most seen in America in wealthier areas where generations founded in the turn of the century kept their families. Once it reached America in the 1800’s, more attention was given to Beaus-Arts when the World’s Columbian Exposition in Chicago in 1893 featured many Neo-classical buildings that later became templates for powerful public buildings nationwide.

Figure 2: École des Beaux-Arts in Lyon France

The Beaux-Arts style is characterized by several identifiable features shown in Figure 2 of the school in Lyon. The flat or low-pitched roof emphasizes the horizontality of the entire structure; wall surfaces are often covered or accented with garlands, floral patterns, or shields to show the buildings status and the importance of its residents; the front façade is symmetrical to emulate the classical architecture used as inspiration for the style; rustic stonework is often used on the first story to draw attention to the entrance, and the overall color scheme has subtle polychromy; the entire building is usually monumental in size, again to highlights its importance; and finally, there are columns, statues, sculptures, mosaics, or murals on the exterior to assert the identity of the building.

Figure 3: Grand Central Terminal (1913), New York City.

Figure 4: The San Francisco War Memorial Opera House by Arthur Brown Jr. (1932)

Figure 5: Facade of the Metropolitan Museum of Art, New York, by Richard Morris Hunt (1902).

Beaux-Arts Designers

Jean-Louis Pascal was a French born architect who studied and subsequently taught at the École Nationale supérieure des Beaux-Arts in the 1860's. After graduating and served a brief residency at the Villa Medici in Rome, Pascal was commissioned to finish work on the National Library of France (a building whose interior reflected the Beaux-Arts style well), (Fig. 6) as well as the tomb of French historian Jules Michelet at Père Lachaise Cemetery in 1893. This tomb (Fig. 7) looks almost identical to one bay of the École, with a flat "roof", columns, ornate sculpture, and stonework along the bottom. Pascal and his peers were the most well-documented designers who brought the Beaux influence to the United States in the 19th century.

Figure 6: Interior view of the oval room in the National Library of France

Figure 7: Tomb of French historian Jules Michelet at Père Lachaise Cemetery in 1893

One of Pascal's peers who studied with him and later returned to the States to open his practice was Guy Lowell. Lowell, like Pascal, kept up with designing in the style of the Beaux-Arts throughout the beginning of the 20th century in his Boston practice. He designed the Boston Museum of Fine Arts (1906–09 and later additions) and the New York State Supreme Court building in New York City (1912–1914 and 1919–1927) (Fig. 8). This structure is still reminiscent of the French style Lowell learned at the Ecole with a grand temple-like entrance, but he is starting to drift away to blend in more with the plainer vernacular buildings in America.

Figure 8: New York State Supreme Court building in New York City (1912–1914 and 1919–1927

The student of Pascals and of the Ecole who most directly and most heavily impacted Norman Rice's career as an architect, however, was Paul Philippe Cret. Before teaching architecture at UPenn, he was a student in France, following very closely in the footsteps of Pascal fifty years later. He began practicing in America in 1907, bringing what he knew of the Beaux-Arts style to most of his projects and his lessons, and popularizing the French style in Philadelphia specifically before many of his students diverged from it. Cret designed (from 1930 – 1945, after Cret was done teaching) the main building on the University of Texas (Fig. 9) campus from, the base of which is almost identical to the Ecole in France.

He also designed the Pan American Union Building in D.C. (Fig. 10) where more modern aspects are beginning to surface in addition to the classic Beaux-Arts; more colors are used, and the material is more varied. Additionally, after his ending years as professor in 1929, he designed the Cret Wing of the chemistry department for UPenn in 1941. This building is clearly different from anything else Cret designed in Philadelphia using his French influence.

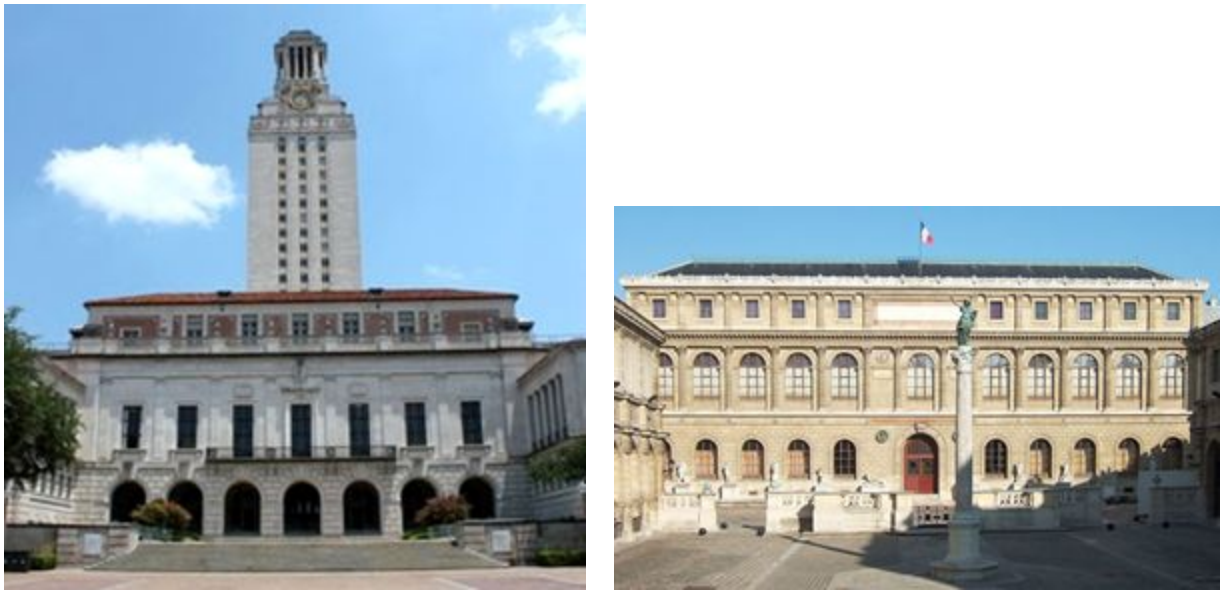

Figure 9: Main building of the University of Texas (1930 – 1945)

Figure 10: Pan American Union Building in Washington DC (1908–10)

Figure 11: Cret Wing of the chemistry building at UPenn (1941)

Mid Century

Because this much more modern building was designed and constructed after Cret had concluded his teaching career, it supports the theory that he followed his students in their movement of “radical revisionism”, or defying the norm in terms of classic movements. In this case, once the Great Depression hit, Americans wanted more conventional and pragmatic buildings and homes. This desire was answered by mid-century modernists such as Kahn and Rice; they used their classical training given to them by generations of French, Beaux-Arts instructed designers, and combined it with the desires and changing fads of the modern day.

Most mid century modern homes display three main characteristics: a clean minimalist aesthetic, and emphasis on bringing the outdoors in, and the presence of angular structures (Fig. 12). Even though, at first look, Beaux-Arts and modern could not be more different, they do have some key similarities. Nature is a critical part of both designs—though one uses nature influence as exterior decoration, and the other “brings it in” using glass walls leading to the outside. Large windows and open floor plans are used to encourage the resident to go outside instead of simply observing a stone replication of nature on a large, elegant, stone building. Both styles use flat planes to emphasize horizontality, but modern homes do it on a smaller scale to accommodate the rural surroundings instead of replicating European architecture.

Figure 12: The Morris Greenwald House by Ludwig Mies van der Rohe in Weston, Connecticut (1955).

Figure 13: Rothner Residence

After traveling to Paris himself to visit and work in the offices of Le Corbusier in 1929, Rice had a new perspective on French architecture. It was more than just the elegant, monumental architecture emulating structures of antiquity; French architecture had taking the same principles and modernized the building techniques and materials to create more efficient and advanced cities with Le Corbusier at the forefront. Rice brought this radical change back to America with him, and officially began a career as the opposite of Paul Cret (despite also working in his offices in the 1930's). Seeing what the American people needed after the Great Depression was one of the main catalysts in Rice's radical revisionism of American architecture and bringing it into the 20th century.

Conclusion

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Rothner Residence

TJU Learning Hub

Riley Gardiner

Spring 2020

Proposal

As an architecture student at Thomas Jefferson University, I have become very aware of the fact that the architecture and interior design programs would benefit from an interactive learning hub on campus. This hub would be a place to see examples of design that we have only talked about in our history classes. The Rothner Residence, designed by Norman Rice, is one of the earliest examples of modernist architecture in East Falls. The home would be the perfect place for interior design and architecture to come and appreciate physical examples of things they have only seen photos of. The home would be furnished with period pieces such as chairs and tables from the Eames, Knoll, and Bertoia collections and many more. The learning hub would provide a hands on experience and understanding of the pieces that shaped the midcentury modern movement as well as the architecture that protects it. Seeing photos of midcentury décor and architecture does not provide the same interest and knowledge as being able to walk through a space and appreciate the work that went into to creating what is now one of the most influential movements in design.

After spending three years in the architecture program at TJU, I have seen many new accommodations being made to give medical students hands on training and experience. Although the studio experience is essential to our learning, I feel that design students would benefit from an on campus learning hub. The field trips that we get to take are amazing, however it would make a lot of sense to have tangible resources at our

fingertips. Our history classes are designed to teach so much material in such a short amount of time and midcentury modern is not given all the time it deserves in the History 4 course. The midcentury modern movement was such a pivotal time in design that engages students on multiple levels and it is important for these students to have physical examples of midcentury work. The Rothner Residence is the perfect hub to showcase how the midcentury modern movement impacted Philadelphia.

The Rothner Residence embodies the Philadelphia midcentury modern movement. Norman Rice designed built in shelves, large window walls, and customized spaces using typical materials of the time. Thomas Jefferson University should be using the Rothner Residence as a resource for its design students and their studies. Using the Rothner Residence as a house museum will allow students to explore pieces they want to know more about or discover pieces they never got the opportunity to learn about. Architecture is all about exploration and the Rothner Residence could be a hub of exploration for the students.

Proposed Designs

Catalog

A

Florence Knoll™ Relaxed Sofa
Knoll 1954 Collection
$4,044

B

Risom Side Table - Round
Jens Risom 1943 Collection
$52

C

Three Legged CylinderTable Lamps
Isamu Noguchi 1944
$101

D

Eames Storage Unit 400
Made by Herman Miller in 1950
$282

E

Unkown Designer
Belgium 1952

F

Splay Leg Table
George Nakashima Collection for Knoll Furniture 1946
$138

G

Eames Lounge Chair & Ottoman
1956
$310

H

George Nelson Bubble Lamp
1952 Currently in the home
$51

I

La Chaise
Eames 1948
$136

J

1966 Dining Table
Richard Shultz 1966
$439

K

Saarinen Executive Armless Chair
Eero Saarinen 1950
$88

L

Unkown Designer
Illinois 1948

M

Triple Bubble Lamp Fixture
George Nelson 1952
$38

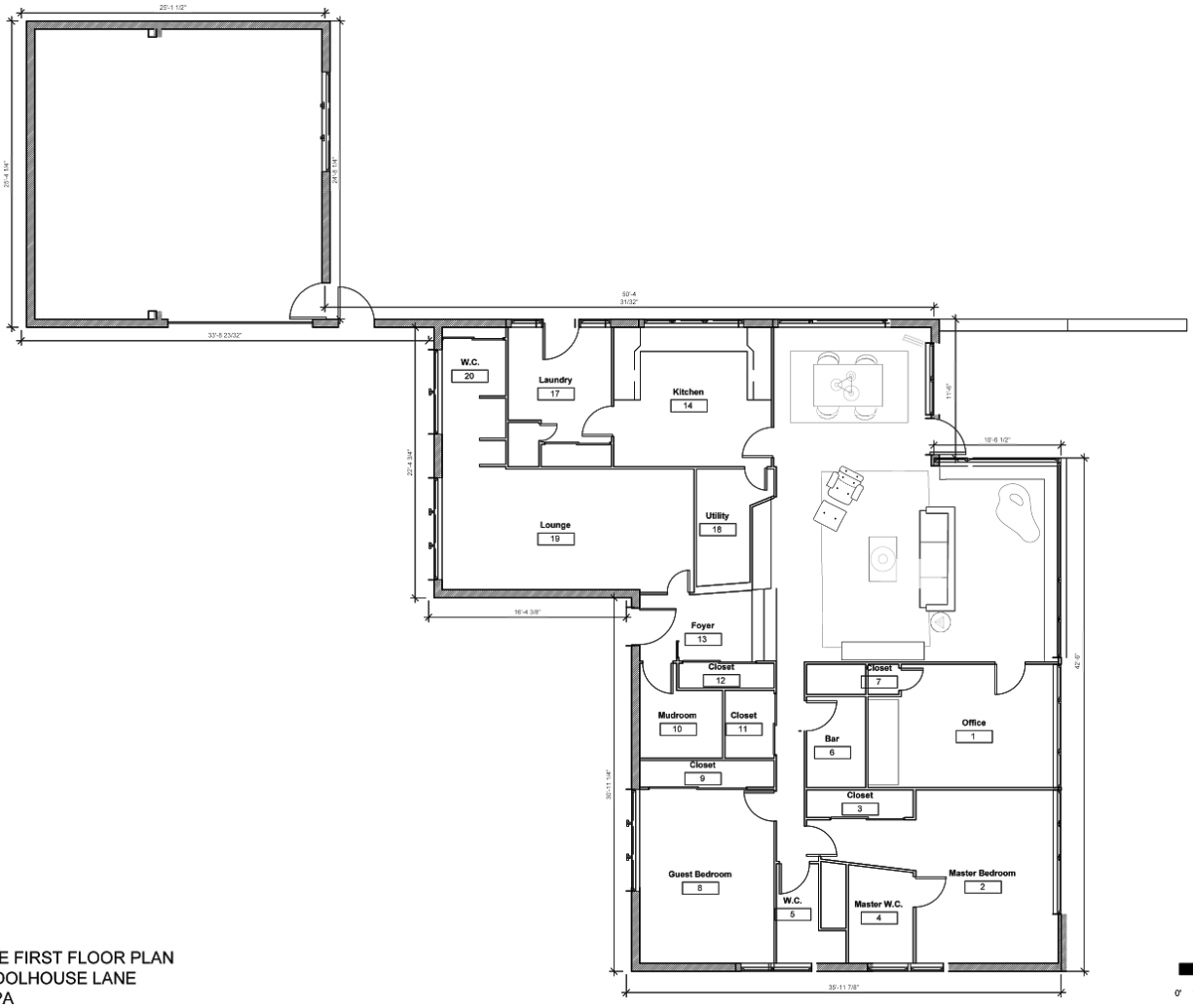
N

The Tea Cup
Jackson Pollock 1946

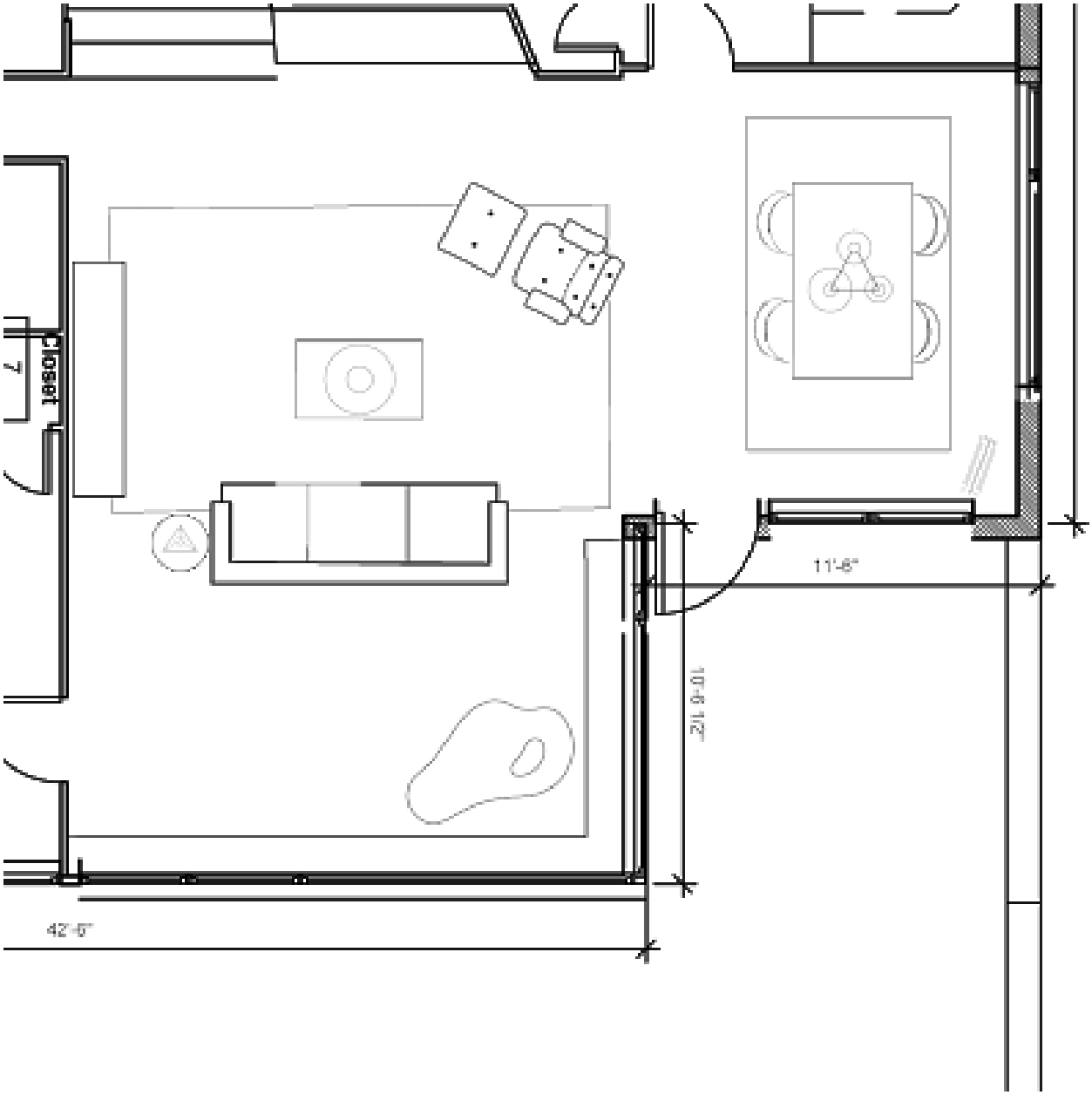
O

Maquette for Manufacturers Hanover Bank
Harry Bertoia 1954

Furnishings Plan



ROTHNER HOUSE FIRST FLOOR PLAN
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA


7
18501
11'-6"
10'-8 1/2"
42'-6"

Additional Furniture Options

Straight Chair
George Nakashima Collection for Knoll Furniture 1946
$63

LCW
Charles & Ray Eames 1946
$82

EM Table
Jean Prouve 1950
$339

Diamond Chair with Full Cover
Harry Bertoia 1952
$221

Rectangular Coffee Table
Charles & Ray Eames 1948
$82

Fiberglass Armchair
Charles & Ray Eames and Girard Herman 1950
$52

Eames Storage Unit 200
Charles & Ray Eames 1950
$163

Bertoia SIde Chair
Harry Bertoia 1952
$84

Low Table Rod Base
Charles & Ray Eames 1950
$94

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Rothner Residence

Guidelines for Interior Rehabilitation

Adam Hoover

Spring 2020

Introduction

While Norman Rice is a well-known Philadelphia architect, his projects and philosophy of design are not well researched or documented. The lack of documentation increases the struggle of respectfully preserving Norman Rice's projects. Luckily, a considerable amount of Norman Rice's projects still exist, leaving hope for future research. The Rothner Residence is an excellent example of a well preserved Norman Rice building. A series of respectful owners left the majority, if not all, of the home's key defining features. The risk remains, will future owners be as respectful?

The Rothner Residence is on the Philadelphia's Historic Registry under two criteria for designation it (1) embodies distinguishing characteristics of an architectural style or engineering specimen; and (2) is the work of a designer, architect, landscape architect, economic, social, or cultural development of the City, Commonwealth, or Nation. While the registry listing protects the exterior of the project to a certain degree, the interior remains at risk for future home renovations.

Purpose for the Study

The purpose of this study is to inform future owners on methods to modify the Rothner Residence without removing the home's key concepts and architectural features. Residential properties, in particular, face rapid renovation to suit the wants and needs of new owners. Especially for owners that uneducated on Mid-Century Modern characteristics, unlike Janet Grace and past owners, these guidelines will allow for the home to respectfully change to fit the needs of any new owner.

Methodology

The methodology for developing the Guidelines for Interior Rehabilitation for the Rothner Residence was a challenge. Due to the lack of prior research on Norman Rice's philosophy of interior spaces and the design process of the Rothner Residence, creative strategies were necessary to collect information. Initial research added perspective on the Mid-Century Modern Style and standards of rehabilitation methods. Primary references included: The Secretary of Interior's Standards for Rehabilitation, Attitudes Towards Modern Living: The Mid-Century Showrooms of Herman Miller and Knoll Associates, and Interior Design and Decoration 4th ed.

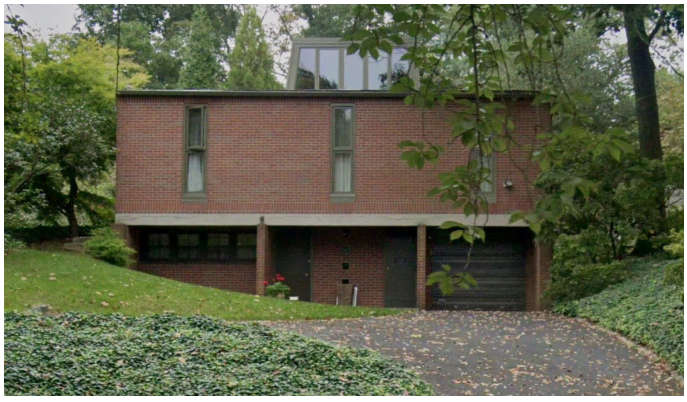
After initial research, the next goal was to understand Norman Rice's design philosophy, through a series of visual analysis through photographs of three of Rice's projects. 3909 Vaux Street is another Rice house near the Rothner Residence in East Falls, Philadelphia. The Beth Hillel - Beth El Synagogue in Wynnewood, Pennsylvania. Finally, Rice's own office in Fitler Square. This visual analysis led to the definition of key features found in Rice's interiors. The next stage used those defined features to compare to the features of the Rothner Residence, identifying the key architectural concepts and features that hold the significance of Rice's design. Finally, creating the guideline to inform future users which spaces and features can be edited and the features that should remain to hold the significance of the home's interior.

Visual Analysis

3909 Vaux Street Philadelphia, Pennsylvania

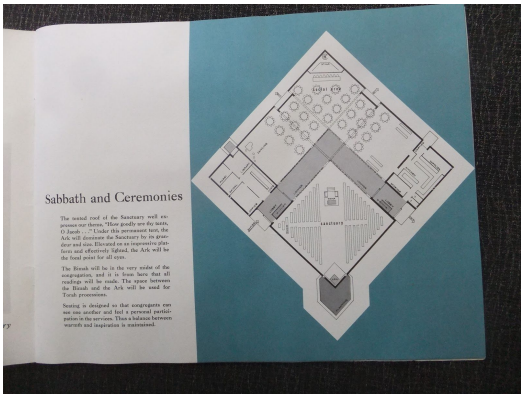
3909 Vaux Street is a short walk from the Rothner Residence, in the same neighborhood of East Falls. 3909 Vaux Street is a two-story brick building. The home features key concepts such as a private façade with smaller openings on the west elevation against Vaux Street. The east elevation facing the backyard has larger openings connecting the interior and exterior. The program of this interior divides entertaining, private, and utility spaces revolving around a central hearth. Utility spaces are located on the south side of the building, while private spaces like bedrooms are on the north side. Entertainment spaces such as the living room on the east side of the residence. A garage, guest bedroom, and studio occupy the ground floor while primary areas like the kitchen, dining room, living room, and master bedroom occupy the second floor. There is an explicit use of compression and expansion throughout the house. The living room, dining room, and master bedroom have high ceilings with lots of light while the kitchen and ground floor.

Some key features to highlight in the home are the warm paneled ceilings in the living room. A focal point of a large dormer skylight brings high natural light into the space highlighting the staircase and central hearth. Glass block construct vertical light strips throughout the house on the west elevation and throughout the house.



Beth Hillel - Beth El Synagogue Wynnewood, Pennsylvania

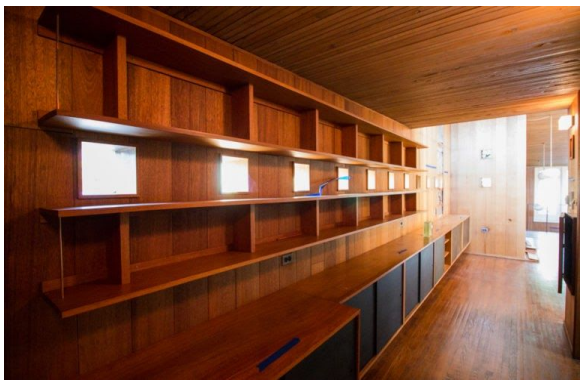
The Beth Hillel – Beth El Synagogue is not a residential property but holds a lot of the same characteristics of the Rothner Residence and 3909 Vaux Street. From the street, one cannot see the entrance of the synagogue, creating a private street façade. Small openings do not allow clear views into any of the spaces. The plan is organized into three squares in an L shape; the entrance is in the inner corner of the L. Labels on the plan of the synagogue indicate a division between sanctuary, social, and administrative spaces. There is a hierarchy if the three divisions with administrative and social areas are more compressed while the high sanctuary ceilings and vertical window openings to express the height. The masonry of the sanctuary interior has hidden vertical courses, emphasizing the horizontality of the masonry. Warm colored wool panels highlight the bimah of the sanctuary. In the administrative and social spaces, high windows naturally light those spaces.

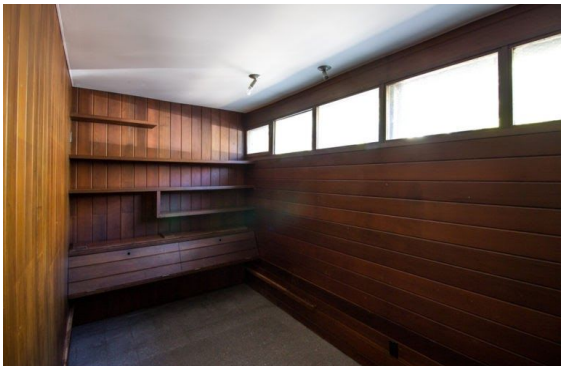


Norman Rice Office Philadelphia, Pennsylvania

Norman Rice's Office near filter square closely relates to his residential projects. From the exterior, one may mistake the office with a residence. The office is a long rectangular form with a second story addition on pushed back from the street entrance. Small windows and high

clerestories create a private façade for the office. There is a clear hierarchy of clients, private offices, and utility spaces with the use of the interior volumes. The conference areas on the second floor feature large clerestory lights while private offices and areas like the break room are condensed with smaller window openings. Wood paneling finished the majority of the walls and ceilings, which created a warm environment throughout. Built-in shelves and cabinets allow for a large amount of storage throughout the office.





Key Concepts & Features of the Rothner Residence

Key Concepts

- The division between entertaining, private, and utility spaces
- The focal point of a central hearth
- The horizontality expressed through the masonry coursing, windows, and extended eaves
- Private façade hid from street view with smaller window openings

The Rothener Residence, like all other of the analyzed projects, feature a division of entertaining, utility, and private spaces. The center corner for entertaining, the south wing for utility areas, and north wing for private spaces. There is a central hearth in which the spaces rotate. The façade of the house is hidden from the street and features smaller openings. (For a more detailed description of the interior see Section 3.4.)

Key Features

- Warm paneling in the living room and office
- Manufactured aluminum windows
- Built-In shelves in the living room and office
- Central random ashlar fireplace

Prior Renovations

- Adaptation of the old garage into a den
- Adaptation of the darkroom into a bar
- Replacement of the asbestos floor with slate
- General maintenance and repairs

The figure above identifies the level of impact the previous renovations made of the identity of the home. Major modifications indicate additions and major programmatic changes like the adaptation of the original garage, a utility space, into a den, entertaining space. Moder modifications indicate a minor change like the darkroom to a bar, maintaining the concept of private spaces. Minor modifications include general maintenance.

Guidelines for Interior Rehabilitation

Hierarchy of Spaces

The hierarchy of the spaces in the Rothner Residence reflects the organization and the presence of key features or concepts. The living room, dining room, office, and entrance are the most significant featuring the most defining features including the wood paneling and fireplace. The master bedroom and kitchen rate at a moderate significance due to their organization. The master bedroom is located along the northwest elevation which is the most significant elevation due to the presence of the windows. The kitchen wall is a clear divider between the entertaining and utility spaces, the removal of the kitchen wall would destroy that visual divide.

Risk Levels for Modification

The levels of risk identify potential features and areas new owners would most likely modify. Based on contemporary standards, an owner would want a large master bedroom and kitchen. The cypress paneling is “outdated” to most contemporary design and would be at risk of removal or painting. As a result, the spaces adjacent to the kitchen and master bedroom are put at moderate risk if the owners chose to demolish walls to open up space. The low-risk spaces include the previously renovated and most desirable portions of the house like the renovated den, detached garage, living room, office, and dining room.

Rothner Residence

Norman Rice's Design Ideologies

Srinithi Jaganathan

Spring 2020

Introduction

Norman Rice was born in Philadelphia. He graduated from Central highschool and studied architecture at the University of Pennsylvania with Kahn, where they both earned a B.Arch. degree in 1924. During his senior year, Rice served as a teaching assistant in graphics. After graduation, he worked as a draftsman and designer with several Philadelphia firms, including Paul Cret, John Molitor, Zantzinger, Borie & Medary, and Tilden, Register & Pepper, and also worked with Kahn on the Sesquicentennial Exposition while both were in Molitor's office. partially due to the frustrations of the experience of watching city corruption in action, by 1928 Rice was by his own account "disillusioned and inclined to quit architecture" and left the US "eager to determine great European buildings everyone imitated." After traveling widely in Europe, the center East, and geographical region, Rice landed within the Paris office of Charles Edouard Jeanneret and Pierre Jeanneret, working there with Jose Luis Sert, among others, between 1929 and 1930. Rice returned to Philadelphia in 1931, revitalized by his exposure to Charles Edouard Jeanneret, and joined the firm of Howe & Lescaze during the seminal PSFS Building project. In 1932, Rice established an independent practice in Center City Philadelphia that lasted for a few fifty years. He was very active within the profession, serving as a director of the Philadelphia Chapter of the AIA in 1953-55 and 1962-63, its vice-president in 1958-59, and president in 1960-61.

He led the Pennsylvania Society of Architects in 1964-66, and subsequently chaired its commission on Architectural Design. In 1971, he was named to the Pennsylvania State Art Commission and remained on that until 1980. Rice joined the national AIA in 1945 and was made a fellow in 1964. Rice returned to Penn as a lecturer in 1963, continuing there until 1977; he co-taught a Master's studio with Kahn and Robert Le Ricolais until Kahn died in 1974. Rice also taught at the Philadelphia Museum School of Art within the 1950s.

A List of his projects

1. Fitler Square
2. Berenstain Residence
3. Grover Cleveland Elementary School
4. Mikosek Residence
5. Ornsteen Residence
6. Rothner Residence
7. Schleifer Residence
8. Silverstein Apartment and Doctors office
9. Studio Apartment Building
10. Thompson Residence Residence.

Fitler Square

For nearly 22 years Fitler Square was the studio of mid-century architect Norman Rice. It's a brick-and-wood bunker at 24th and Pine chances. The building is squat, paranoid, and definitely out-of-place among the ornate 19th century row houses that ring around picturesque Fitler Square. It was acquired by Kippy Stroud, founder of the Fabric Workshop, after Rice died in 1985. The property most recently served as an apartment for visiting artists of the workshop before it was sold in 2016. This summer the current owners plan to raze part of the one-story section and add a two-story addition, an alteration that most neighbors will likely applaud. Although the building is listed on the Philadelphia Register of Historic Places as part of the Rittenhouse-Fitler Square Historic District, it has been deemed architecturally non-contributing. Yet, as defensive and inharmonious to the surrounding neighborhood as the exterior of the studio is, the inside is a soothing, minimalist time capsule filled with warm wood paneling and uplifting natural light. The owners plan to salvage what they can, but the cozy Atomic Age interior will soon be demolished for new construction.

Design Ideologies

For nearly 22 years Fitler Square was the studio of mid-century architect Norman Rice. it is a brick-and-wood bunker at 24th and Pine chances. The building is squat, paranoid, and definitely out-of-place among the ornate 19th century row houses that ring around picturesque Fitler Square. it absolutely was acquired by Kippy Stroud, founding father of the material Workshop, after Rice died in 1985. The property last served as an apartment for visiting artists of the workshop before it absolutely was sold in 2016. This summer the present owners commit to raze a part of the one-story section and add a two-story addition, an alteration that almost all neighbors will likely applaud. Although the building is listed on the Philadelphia Register of Historic Places as a part of the Rittenhouse-Fitler Square Historic District, it's been deemed architecturally non-contributing. Yet, as defensive and inharmonious to the encompassing neighborhood because the exterior of the studio is, the within may be a soothing, minimalist container stuffed with warm wood paneling and uplifting natural light. The owners commit to salvage what they will, but the comfortable Atomic Age interior will soon be demolished for brand new construction. Norman Rice isn’t a reputation that gets thrown around much nowadays.

The revered Philadelphia-born architect was an in depth, lifelong friend of monumental Modernist Louis Kahn from the time they graduated from Central highschool to their undergraduate days at the University of Pennsylvania to once they returned to show at Penn until Kahn's death in 1974. Nearly every book written about Kahn includes excerpts from correspondence between the 2 confidants. And yet Rice was never quite possessed by the fevered, utopian visions that drove and sometimes undermined Kahn, choosing instead to interact with Philly's architecture community and dig in reception. Rice studied under Paul Cret as a student at Penn. He was the primary American to figure within the studio of Charles Edouard Jeanneret in Paris and frolicked at the firm of Pierre Jeanneret. While working for Howe & Lescaze within the early 1930s he contributed to the planning of the groundbreaking PFSF Building, the country's first International Style skyscraper. Rice opened his independent practice at 29 and spent an industrious career functioning on commissions for the town and residential projects within the surrounding suburbs. He redesigned Fitler Square in 1954, steered the helm of the Philadelphia chapter of the AIA within the 1960s as director and president, lead the Pennsylvania Society of Architects, and taught at Penn from 1963 to 1977.

He was also rumored to be an adversary of Frank Lloyd Wright. Similar to his studio at 2400 Pine Street, most of Rice's designs are restrictive and self-contained, but radiate from the within with light. one among his better-known commissions, the Dr. and Mrs. Jacoby T. Rothner Residence at 3419-23 W. School House Lane, may be a one-story clinker block rancher that appears prefer it belongs on a military base within the desert. inbuilt 1952, the low-slung house is wrapped in ribbon windows interrupted by an oversized pane of glass that appears out into the backyard and also the Wissahickon Valley below. The house was nominated and listed on the local register of historic places by its current owners in 2010. Other commissions, like Temple Beth Hillel in Wynnewood, District Health Centers #10 next to Northeast Regional Library on Cottman Avenue, and Rice's United States President primary school addition are equally detached from the surface world. Although the design was indicative of the days, this theme of protection and isolation is reoccurring in Rice's body of labor. Even the concrete bleachers he designed for Whitehall Commons Playground are asocial and uptight. Yet, as Rice's buildings shut up and stiffen their backs, inside skylights and clerestories brighten their interiors with an unexpected sensation of heat, welcome, and calm.

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Rothner Residence

Window Care Plan

Alex Jones

Spring 2020

Philosophy and Impact

For the Rothner Residents, the philosophy of the house is to maintain as much of the original integrity as possible with the intent to perform maintenance and repairs that keep original components in fair and functioning condition, as well as to in case of severe circumstances be able to replace elements in kind, or find as similar elements as possible for parts that may be unavailable. The intent of the window care guide is to be able to understand the elements of how to maintain and protect the windows that are in the residents, as well as to how to facilitate best care methods and practice for the windows. The research will also highlight important elements to consider in case of need of replacement of the windows.

The Secretary of the Interior Standards ten-step preservation framework will also serve as a guide throughout the project to further preserve the integrity of the house. Most of the windows are in fair to good condition and severe intervention is not needed at this time but will be brought into consideration in case of the event that something in the future does occur.

The original windows in the house were manufacture by the company Cupples, and the replacement windows that owner Janet Grace had installed were Beta Pane IGCC 1436 E2190 windows possibly manufactured by Thermopane. It is recommended by the preservation tech notes that even if hardware for the windows is in proper

working condition, that spare parts are obtained for future repairs in case a piece of hardware does break or gets damaged, or to at least see if replacement parts are available. All damages such as failing gaskets, cracked windows, cracked sealants, etc can all be referenced in the Conditions Drawings for specific locations of the window unit.

Note that not all of the windows are original, some have been replaced over time

Elements

Aluminum

The usage of Aluminum windows became common after World War II. The increase was due to machinery being switched from the production of planes and tanks for the war effort, to the need to create fast and affordable housing for the people returning for war.[1] Most Aluminum windows are created through an extrusion process that allows for standard or custom sizing and mass production for an assembly process. Through this process two types of windows were created, the types are an interlocking screw assembly method, or welded component assembly.[2] For the Rothner Residents the interlocking screw assembly was chosen. Another aspect of the window construction was the production of operable and inoperable windows, which both are used in the house. The operable windows are a double hung sash and frame that also have

[1] Prudon, Theodore H. M. *Preservation of Modern Architecture*. Hoboken, NJ: John Wiley & Sons, 2008.
[2] *Preservation Tech Notes*. Vol. 22. Washington, D.C.: U.S. Department of the Interior, National Park Service, 1989.

additional storm/screen inserts as well as additional hardware. The inoperable windows that are present have no additional hardware.

Finish

The aluminum windows that are present in the Rothner Residence are unfinished, although different finishes are available. Notably, some of the window frames do have a paint coating over them. Being aluminum, the window frames are resistant to rusting, and if any indication of rusting is present, an investigation should be conducted to determine if galvanic action or of some kind of chemical deterioration is present.[3] Many window companies also offer different coatings to be applied, while there is no evidence at the present time that a coating is present, it is possible that there was a coating during the time of construction that is no longer present. Some windows may have an oxidized patina that can be removed in the cleaning process.[4]

Hardre

Hardware is noted to be on all of the operable windows in the Rothner Residence. There are multiple elements pertaining to the hardware of the window units. Each of the operable windows should have a storm window, screen insert, and a series of mechanics that allow for each of the windows to be latched opened and closed. The condition of the operability hardware is not currently known due to limitations of the conditions

[3] *Preservation Tech Notes*. Vol. 22. Washington, D.C.: U.S. Department of the Interior, National Park Service, 1989.

[4] Prudon, Theodore H. M. *Preservation of Modern Architecture*. Hoboken, NJ: John Wiley & Sons, 2008.

assessment that was performed, however some pieces are noticeable broken. Further assessment can indicate the level of maintenance required for each piece of hardware to be either replaced, repaired or greased in order to restore operability. As of this time, no windows have the screen inserts and should be obtained if desired when windows are open. Notable hardware elements include pins and screws to lock storm windows and screens in place, as well as various elements to lock or adjust placement on the sliders of the window. For replacement of the hardware, some manufactures if still in operation can be contacted for replacement parts, or for manufactures that are no longer in order, there is possibility that a salvage company may have the desired components.

Glass

In the Rothner Residence all of the operable windows are single paned glass, with storm windows, and all of the fixed windows are double paned. For the operable windows the largest problem faced is the cracked panes inside the windows. For the double paned windows, fogging has been an issue in the past leading to the replacement of the windows, as well as one window currently is beginning to fog. Further research is needed in order to determine the type of glass that is in each of the windows. One aspect of the windows that is present is the different textures that the glass has. The bathrooms are the areas with textured glass, one being a horizontal texture and the other being a generic texture that does not follow simple striations. The textures should be taken into consideration if replacement is needed in the future, in order to match or find

as similar as possible pattern. In two areas, a textured glass block is also used, and the texture should be matched if in need of replacement in the future.

Common Problems

Cracks

While the windows are broken, since it is just a crack there is little to no need for replacement. The cracked windows pose no risk of injury and the repair would be aesthetic. One option of repair is a form of glass bonding agent that would render the crack invisible, or to ultimately replace the pane. When replacing the pane of glass important elements to note are the height, width, and thickness of the glass pane in order to ensure that the replacement fits into the frame. If possible, match the type of glass that is currently in the window unit.

Sealants

Cracked and/or hardened sealant are a common problem in the Rothner Residence. Window sealant should regularly be inspected and replaced as needed in order to keeps its functionality.[5] In order to reseal the window, all old sealants, as well as aluminum beading should be removed. If aluminum beading is present, determine if beading is reusable or if it needs to be replaced. The sealant used should be a metal safe glazing, and should be replaced regularly.

[5] *Preservation Tech Notes*. Vol. 22. Washington, D.C.: U.S. Department of the Interior, National Park Service, 1989.

Gaskets

The windows with gaskets and lock stripping should be checked regularly in order to confirm that all gaskets are in good condition and are not failing.[6] One of the largest indicators of a failing gasket is if fogging in a double pane window occurs. In order to replace the gasket proper dimensions are needed in order to determine the correct replacement size. Furthermore, the level of difficulty in replacing the gasket should be assessed. The level of difficulty in replacing the gasket can help determine the severity of the need to replace the gasket.

Care Methods

Cleaning

For a simple cleaning, storm windows should be removed in order to enable one to wash and dust the interior panes of glass, as well as to clean and dust the outer layers of the glass. For the aluminum framing and components, a mild soap and water scrub is appropriate. Abrasive cleaners and chemical agents can also be used on the aluminum, but spot check the cleaning agent on an inconspicuous area before application, as well as to make sure the abrasive cleaner is aluminum friendly.[7] Removal of any animal intervention should also be removed such as the nest located on window E – 13.

[6] Prudon, Theodore H. M. *Preservation of Modern Architecture*. Hoboken, NJ: John Wiley & Sons, 2008.
[7] *Preservation Tech Notes*. Vol. 22. Washington, D.C.: U.S. Department of the Interior, National Park Service, 1989.

Although this seemed to be an isolated incident, regular inspectin of windows should be completed

Repair

The window repairs should be completed in a level of priority from high to low depending on the condition of the windows.[8] Since all of the windows are in fair condition the windows can fall under the low priority, and can be completed at the owners discretion. One notable repair to be noted that may be a medium priority would be the cracked masonry below window unit E - 13. Some of the more common problems include broken glass, cracked sealants, broken storm panes, cracked or broken gaskets, broken hardware components, and to check for instability amongst any windows.

Reinstallation

Reinstallation is the process of removing repairing and reinstalling the window to the original location. This can be done for repairs that are not required to be replaced, or can also be completed in order to replace hardware components that can not simply be fixed while the window is in the wall. This method could also be used in the case of window unit E – 13 during an investigation and repair of the masonry crack in order to protect the window from sustaining damage during the repair. Reinstallation can also

[8] Burke, Sheridan, Jyoti Somerville, Gail Ostergren, Laura Matarese, and Chandler McCoy. *Eames House Conservation Management Plan*. Los Angeles: The Getty Conservation Institute, 2018.

resolve any structural integrity or insulation issues that may be a problem for the window. Not recommended for minor repairs or for storm window repairs.

Replacement

Replacement of the windows is to be used as a worse case scenario treatment for any window units in the residence.[9] While the replacement of any window is not needed at this time, potential replacement in the future is possible. If a window is needed to be replaced, the height, width, and depth of the frame, sill, panes, as well as material, finish, and aluminum gage all need to be recorded in order to have a custom window be made in order to maintain the integrity of the windows appearance. Since all of the windows are in good condition, as much of the documentation as possible should be completed now in order to have the information if needed.

Abatement

Asbestos was common in glass block prior to the 1980's as well as being present in some window sealants.[10] While no evidence suggests that there is asbestos in any of the materials, further investigations by a professional should be conducted in order to determine the safety of the materials and to follow the proper abatement process and remediation methods.

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[9] Burke, Sheridan, Jyoti Somerville, Gail Ostergren, Laura Matarese, and Chandler McCoy. *Eames House Conservation Management Plan*. Los Angeles: The Getty Conservation Institute, 2018.

[10] *Preservation Tech Notes*. Vol. 22. Washington, D.C.: U.S. Department of the Interior, National Park Service, 1989.

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Rothner Residence

Glass Block Study

Helen Phan

Spring 2020

Contribution to CMP

I chose this topic because I thought it was a feature of the house that was prominent and character-defining, but not a material that is widely talked about, except in negative connotations. I thought it was interesting that glass block represented a specific time because of its quick rise and fall in popularity and I wanted to see how that dynamic tied into modernism. By explaining the context in which glass block was made, its influences in modernist architecture, and methods for its conservation, my project will help gain further understanding of the house's significance and also contribute information to the house's material conservation.

Methodology

My methodology of this project was highly research-based so I had to come up with a research strategy that allowed me to span between very broad topics, such as the modern movement, to very specific ones like the types of blocks produced and available. I had to also keep in mind that it had to tie in with the Conservation Management Plan for the Rothner residence. I started off with my thesis, which argues that glass block is a significant feature of the house's architecture. This led me to think about the role that glass block plays into the larger scope of modernist design and about why it should be preserved in this context of architecture. From there, I realized that its innovation played a crucial part in its use in this time period, which led me to look more specifically how it was made and the consumer attitudes towards it leading me to examine more anthropological texts and also trade magazines.

Though today glass blocks are seen as distasteful and are even hated by some, there was a time when glass blocks were seen as innovative and a sign of being in the know about the newest technology and trends. At the time they were introduced to Americans, there were several factors that helped create the right environment for glass block to become popular. First, the Industrial Revolution towards the end of the 19th century increased populations in cities leading to worsening living conditions and creating a focus on the connection to nature as a way to improve health. The revolution also affected the construction industry with the appearance of machine-made items that were cheaper and easier to use. The globe was also experiencing the aftereffects of both world wars which spanned from 1914-1918 and then 1939- 1945[1]. One effect was an underlying sense of fear, but also the sense of renewal in Americans. Another effect was the arrival of modernists Walter Gropius and Mies van der Rohe immigrated to America around 1937 and 1938[2] . Another major change came with the electrification of homes, with only two-thirds of American homes being electrified by 1930, which transformed ideas about light, both artificial and natural[3]. Light came to be a symbol of progress and productivity. Then there was the Great Depression from 1929-1939, affecting consumer attitudes towards a more conservative way of living. At the same time, the government

[1] History.com Editors, *World War II*, History.com, . A&E Television Networks, October 29, 2009, https://www.history.com/topics/world-war-ii/world-war-ii-history.
[2] Elizabeth Fagan, *Building Walls of Light: The Development of Glass Block and Its Influence on American Architecture in the 1930s*. (Columbia Academic Commons, 2015), 109.
[3] Ibid.,11.

was trying to boost the economy and so advertising tactics changed to reach a larger audience[4].

The development of glass blocks were influenced by the invention of vault lights and prismatic glass tiles in the late nineteenth century. They would be set into the city sidewalks as a way to light dark interiors such as cellars and basements and were made of solid glass[5]. Then in 1897, the Luxfer Prism Company introduced a vertical version of glass slabs that was a way to integrate nature more easily into daily lives and as a "remedy for some of the negative effects of modern civilization"[6]. They advertised it in uses such as facade material, partition walls, and windows. Around the same time in 1886, French engineer Gustav Falconnier patented his lozenge-shaped glass blocks, which would be known as the first hollow glass block. Falconnier's blocks were first introduced to Americans at the 1893 World's Columbian Exposition. Not until the 1933-1934 Chicago Century of Progress International Exhibition, and the later 1939 New York World's Fair did glass companies picked up on this new innovative way of treating glass[7]. Among these companies were The Structural Glass Corporation, Macbeth-Evans Glass company, Owens-Illinois Glass Company, and the Pittsburgh-Corning Company[8]. The former two pretty quickly dissipated, but the Owens-Illinois Glass Company and

[4] Nathan Glazer, From a Cause to a Style: Modernist Architecture's Encounter with the American City (PrincetonUniversity Press, 2011) 15.
[5] Fagan, *Building Walls of Light*, 5.
[6] Ibid.,9.
[7] Ibid., iii.
[8] Thomas Jester, *Twentieth-Century Building Materials : History and Conservation*, (New York, McGraw-Hill, 1995), 195.

Pittsburgh-Corning Company continued strong with their own glass block models, the Insulux for Owens-Illinois and PC block from Pittsburgh-Corning.

Early glass blocks were hand blown or cast into molds, but later evolved to being made from two halves combined with an airtight seal. The seals were initially made with cementitious and solder-based sealants, but eventually were replaced with a technique that sealed blocks by pressing together two halves whose edges have been heated. Coatings, originally made of synthetic resin and fine spread of sharp-grained sand or marble dust, then replaced with plastic coating, were then applied to the sidewalls to improve bonding to other blocks and materials[9]. The companies would make the blocks in a variety of sizes, colors, and with varying face patterns as a way to add decorative appeal and increase its usability to both architects and homeowners. In their trade catalogs, they would boast of its many beneficial characteristics such as allowing light in, maintaining privacy, providing high levels of thermal and sound installation, easy maintenance with both repairs and cleaning, and protection against intruders[10]. It was described as the end-all be-all of building materials that would "be at once enclosing wall and window, admitting light, and impervious to heat and cold"[11] . Because of these properties, it became the perfect material to express modernity.

In her paper, Elizabeth Fagan identifies the two ways glass block was used. The first was the application of glass block as a whole wall, similar to the way traditional

[9] Jester, *Twentieth-Century Building Materials*, 195.
[10] "The Glass Age Arrives : Pittsburg Corning Glass Blocks." (Pittsburg Corning Corporation, 1938).
[11] Ibid.

masonry was used. She purports that this way of using block was characteristic of the Streamline Moderne style[12]. This style came out of the need for a new style that was “free of the trappings and encumbrances of the past” and used this idea of “streamlining”, which took cues from the motion and speed of new modes of transportation such as the car and train[13]. The style emphasized volumetric forms and curved shapes. The other method ,used in modern and international styles, involved using glass block as planar surfaces and mostly as infill. Plate glass would be replaced with glass block as a cheap and easy way to update a building. Its multifunctionality made it a compatible choice for the modern and international styles because it added visual interest, while being performative.

Even though glass block is a relatively new material, it is still necessary to develop conservation methods since it is a distinctive material of the modernism period. Glass block has a several different ways that it can degrade. One of them is the seal breaking. This can be due to cracks in the mortar allowing moisture to sit on its bedding edges. Once that occurs, moisture can seep through and waterborne minerals can cloud the inside face or trapped water can freeze and shatter the glass[14]. Another issue that can happen is that the bond between the side walls and the mortar can also fail. Early blocks were not structurally sound enough to hold against weather conditions, which is why later blocks added a sanded adhesive coating to the side walls. Finally, bowing, cracking,

[12] Fagan, *Building Walls of Light*, 69.
[13] William Kowalik, *Streamline Moderne Design in Consumer Culture and Transportation Infrastructure: Design for the Twentieth Century* (New Errands: The Undergraduate Journal of American Studies, 2017).
[14] Derek Trelstad, *The Hecht Company Warehouse* (Building Renovation, 1993), 31.

and crushing can happen when there are a lack of expansion or isolation joints in a large span of glass block wall. Original joints were caulked with oakum and sealed with mastic, and over time with water infiltration it can weaken the bond between block and masonry or long-term hardening causes the block to fall out of place[15].

There are several different levels of treatment to keep in mind that include maintenance and repair. To preserve existing glass block that is in good condition, it should be washed with water and a mild detergent and then with a cotton cloth, wiped dry. Solvents that are compatible with the glass can help remove more stubborn stains. Just as with traditional masonry, joints should be repointed where needed. Deterioration that is more serious require repairs such as bowing and extensive cracking. A solution for this involves adding expansion joints into areas that already need replacement block. For replacement, Jester suggests that this should only be implemented if the structural strength is compromised, if the block has shards that might fall, or if it has chips and cracks that may allow water to enter[16]. A tactic that does not require replacement, but protects from water infiltration is through flowing adhesive of the same refractive index as the glass into the crack[17]. Using a technique called epoxy edge-gluing creates an almost invisible and strong repair.

If a replacement is required however, glass block is still made today, but Pittsburgh-Corning, had shut down its glass block plant in 2016 due to low demand of the

[15] Jester, *Twentieth-Century Building Materials*, 199.
[16] Jester, *Twentieth-Century Building Materials*, 199.
[17] Roberto Rosa*, Adhering to the Point: the use of Adhesives in Stained Glass Restoration* (Cathedral Communications, 2004), https://www.buildingconservation.com/articles/stainglass/stainglass.htm)

product. With the patterns being produced by the company slowly being discontinued, there comes an issue of finding accurate replacements. It is not recommended to use salvaged block for one. Also custom dies may be expensive, especially for smaller projects. However, there are several other companies such as GBA Architectural Products and EXTECH/Exterior Technologies that produce glass block domestically and many international companies such as Seves Glass Block Inc.. Some companies even have patterns similar to earlier patterns and Seves even has a model of their Vistablok that is based on the Pittsburgh-Corning old specifications[18]. But the sand that creates the hue, varies from country to country, and that may be noticeable if replacing just several blocks in an entire wall.

As a building material, glass block offers a lot in terms of performative characteristics such as privacy, insulation, protection, easy maintenance, as well as allowing light through, which is part of the reason it was sought after for modernist buildings. Its period of popularity from 1937 to the early 1940s, though short, is important in the fact that it solidified its position as a material of the modernist movement. It was efficient, embodied the now, and also changed the way people looked at light. In this, it offered a smoother transition from traditional styles of architecture that used punched out windows to the large expanses of glass of the international style. And finally, relating

[18] Mike Foti, *Pittsburgh Corning to Stop Glass Block Manufacturing – Now What?*, (Innovate Building Solutions ,2016) https://blog.innovatebuildingsolutions.com/2016/05/20/pittsburgh-corning-stop-glass-block-manufacturing-now/)

to the Rothner Residence, it helped support the house's design which focused on the modular and machine-made .

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Rothner Residence

Butterfly Roof Study

Jessica Radomski

Spring 2020

Introduction and Historical Background

Though credit is often given to William Krisel for the creation of the butterfly roof, the concept was in fact conceived by Le Corbusier in 1930 for a project in Chile that was never built (Figure 1), though no information was found stating why Le Corbusier decided to create or use the new roof form. The design for the home of Eugina Errazuriz in Zapallar, Chile was to overlook the Pacific Ocean from a remote site and to respond to the uneven terrain through the use of natural materials and Le Corbusier's new butterfly roof design, which was a "distinctive departure from the flat roofs that had become characteristic of the 1920s."[1] Unfortunately, the plans fell through as Eugina went bankrupt before the project could break ground.

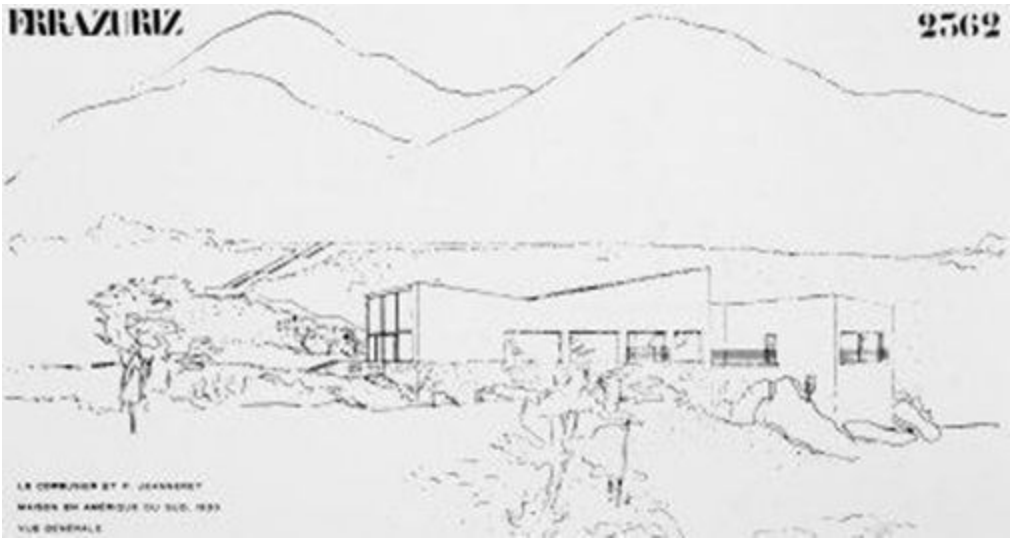

Figure 1: *Maison Errazuriz* A rendering done by Le Corbusier for Eugina Errazuriz's proposed house design showcasing the first use of the butterfly roof. Unfortunately, it was never built.

In 1933, Czech architect Antonin Raymond adopted the butterfly roof design for his summer home in Karuizawa, Japan (Figure 2) with a design that was almost identical to Le Corbusier's Maison Errazuriz. The design would later appear in Architectural Record in 1934, much to the surprise of Le Corbusier, though he only had praise for Raymond's application of his former design.[2] The new roof style was again used in 1945 for a more experimental project by the United States government in its search for pre-fabricated house designs for post-war America. Marcel Breuer designed the Geller House I on Long Island, New York (Figure 3) as an option for one of

[1] Marni Epstein-Mervis, "Le Corbusier's Forgotten Design: SoCal's Iconic Butterfly Roof." Curbed, December 22, 2014.
[2] Ibid.

the pre-fabricated designs and used the roof slopes to separate distinct zones of the house around a centrally located hallway.[3] Two more noteworthy examples of the butterfly roof include Oscar Niemeyer's Yacht Club in Pampulha, Brazil in 1942 and David Mackie and Lloyd Roarke's Cerf House in Lawrence, Kansas in 1958.

Figure 2: *Summer Home* A photograph of Antonin Raymond's summer home in Karuizawa, Japan built in 1933. It was almost a direct copy of Le Corbusier's Maison Errazuriz and was later published in an architecture magazine in 1934.

[3] Ibid.

Figure 3: *Geller House I* An aerial view of Marcel Breuer's Geller House I with the butterfly roof clearly visible in the design.

It was not until 1957 when the butterfly roof became widespread in its use in residential applications. In Palm Springs, California over 2,500 homes boasting butterfly roofs were designed by William Krisel and partner Dan Palmer (Figure 4), and built by Alexander Construction Company.[4] Krisel's designs and implementation of them at such a large scale helped shape the location's desert community and inspire other architects and designers to experiment with the new roof design as well. Krisel's commissions eventually reached over 30,000 homes and reached from San Francisco to San Fernando Valley.[5]

Figure 4: *Butterfly House* A photograph of one of over 2,500 homes constructed in Palm Springs with a butterfly roof after 1957. Krisel and Palmer brought the butterfly roof to the masses.

[4] Morris Newman, "Masters of Modernism – The Butterfly Effect," Palm Springs Life, January 21, 2009.
[5] Marni Epstein-Mervis, "Le Corbusier's Forgotten Design: SoCal's Iconic Butterfly Roof."

The increased use of the butterfly roof in simple residential and commercial projects was due to improved methods in flashing, drainage, and waterproofing in roofing assemblies.[6] Since water drains towards the valley of the roof, flashing needed to extend far up each slope to prevent leaking, a key point that some early uses of the roof design fell short on. However, due to the eaves of the roof sloping upwards from the valley, the design allowed for more and larger windows that allowed for greater amounts of natural light in interior spaces, which was a very important feature in the Modernist house style. Additional advantages and disadvantages applicable to both early and modern butterfly roofs are outlined below:[7]

Advantages

Water collection: This roof form can easily be used to collect water in a holding tank in the center of the home, but it requires designated infrastructure to be built in during construction. Water moves easily off of the roof, however, preventing any potential water damage or mold growth.

Wind resistance: Butterfly roofs are very aerodynamic and resists wind damage from coastal and heavy storms. Fewer repairs and less maintenance due to wind damage cuts down on cost in the long run.

Disadvantages

Cost: This style of roof is complex and difficult to install, as material and labor costs and installation time are usually high. Maintenance tends to be fairly constant, difficult, and costly, especially if in a colder climate.

Water and snow damage: The roof can collapse very easily if clogged with debris or piled with snow. Clogging can cause standing water to infiltrate the home and cause rot or mold growth to begin on the interior of the home or in the roof assembly, causing a health hazard for those living inside and deterioration of the roof structure.

Rothner Residence

The roof of the Rothner Residence is primarily in the shed style with only a portion of the roof in the butterfly style. However, though subtle, the small move by architect Norman Rice to include this roof style in the design of the Rothner Residence did create a unique feature on the

[6] Willis H. Wagner, *Modern Carpentry: Building Construction Details in Easy-to-Understand Form.* South Holland, IL: Goodheart-Willcox Co., 1979.
[7] Vanessa Lord, "The Advantages and Disadvantages of Butterfly Roofs." What You Need to Know About Replacing Your Roof. Mas Mistral, May 7, 2015.

modernist house, one that was especially rare in a northern location like Philadelphia, Pennsylvania. The butterfly portion of the roof sits on the west side of the house and its valley can be seen clearly on the west elevation, sloping upwards on either side of the valley towards the north and south elevations. The shed style portion of the roof is continuous from the northern wing of the butterfly roof at the same slope and continues across the remainder of the house. It can be seen in the east elevation of the house that the overhang of the shed roof over the south elevation creates a visual break between the shed roof and the southern wing of the butterfly roof.

According to the Philadelphia Register nomination form for the Rother Residence, the roofing material recorded for 1974 was rolled asphalt with an aluminum silicate coating.[8] Unfortunately, further information on this type of roofing for this time period was not able to be found. The product found that was closest to this roofing material was modified bitumen roofing. However, though the roofing technique originated and was used in Europe since the 1960s,[9] it was not used in the United States until 1978, eight years after two representatives from the Midwest Roofing Contractors Association (MRCA) traveled to Europe to learn about their new roofing techniques in 1970.[10] The only source found that mentioned this coating material of aluminum silicate only included a photograph of the finish with no further explanation of the roof assembly or the purpose of the coating.[11]

In 2009, the Rothner Residence's nomination form noted Versico 60 mil black rubber roofing as the roofing material, which remains the current roofing material.[12] Currently, Versico black rubber roofing products are still being manufactured and can be easily replaced with the help of the product installers if needed in the future. Though it was unclear what exactly the original roofing material was on the Rothner Residence, the rapid evolution of roofing materials would suggest that the black rubber replacement recorded in 2009 was a suitable and modern substitute for the original roofing material.

Using the information learned from research on butterfly roofs and their construction, drawings of the current roof on the Rothner Residence were created to act as references if any damage were to come to the roof or any restoration work needed to be performed on its assembly. It is to be noted that the framing plan developed is based on common framing techniques of flat and low-sloped roofs that could have been used during the time of the houses construction and on photographs taken of the garage roof rafters during a visit to the house for the conditions

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[8] Janet Grace, "Nomination of Historic Building: 3421 W. Schoolhouse Lane Philadelphia, PA," Philadelphia Historical Commission, April 2, 2010.
[9] "BUR & Modified Bitumen," American Roofing and Metal.
[10] Ray Johnson, "History and Development of Modified Bitumen." Mannford, Oklahoma.
[11] "Guide to Secure Roof Systems in High-Wind Regions," Zurich, May 2015.
[12] Janet Grace, "Nomination of Historic Building: 3421 W. Schoolhouse Lane Philadelphia, PA,"

assessment. Any work or further investigation done on the roof assembly of the Rothner Residence should be used to revise these generated drawings as needed to ensure that the roof's information is kept current and true to the house's current condition. In addition to the roof and framing plans, a segmented section cutting through the butterfly roof perpendicular to the direction of the valley was created as well as construction details of the assembly and should be revised in the same way as the framing plan if findings permit.

Conclusion

The original intent of this project on the Rother Residence's butterfly roof was to study the precedent projects of Raymond's summer home in Karuizawa, Breuer's Geller House I, Niemeyer's Yacht Club, and Mackie and Roarke's Cerf House, and how their butterfly roof assemblies had aged over time. Information regarding any conditions reports or studies would have been used to analyze the roof of the Rothner Residence and predict possible conditions and challenges the roof might face as it continues to age. However, only information regarding the design of the projects in their entirety – not even solely of the butterfly roof design – was found, so the goal of this project changed to a research and conjectural documentation project based on historical documents about the Rothner Residence and references for butterfly roof construction.

Because information on the case study projects concerning the aging of their roof constructions was not found, it creates a gap that should be filled by future studies and preservationists. Butterfly roofs are one of the least common forms of roof construction, which makes it even more important that work be performed and documented to study how these assemblies can age over time. Perhaps knowing the potential future of these roofs can create advancements in their technology that could increase their use in architectural design and extend their lifespans to create architecture that last even longer.

DN

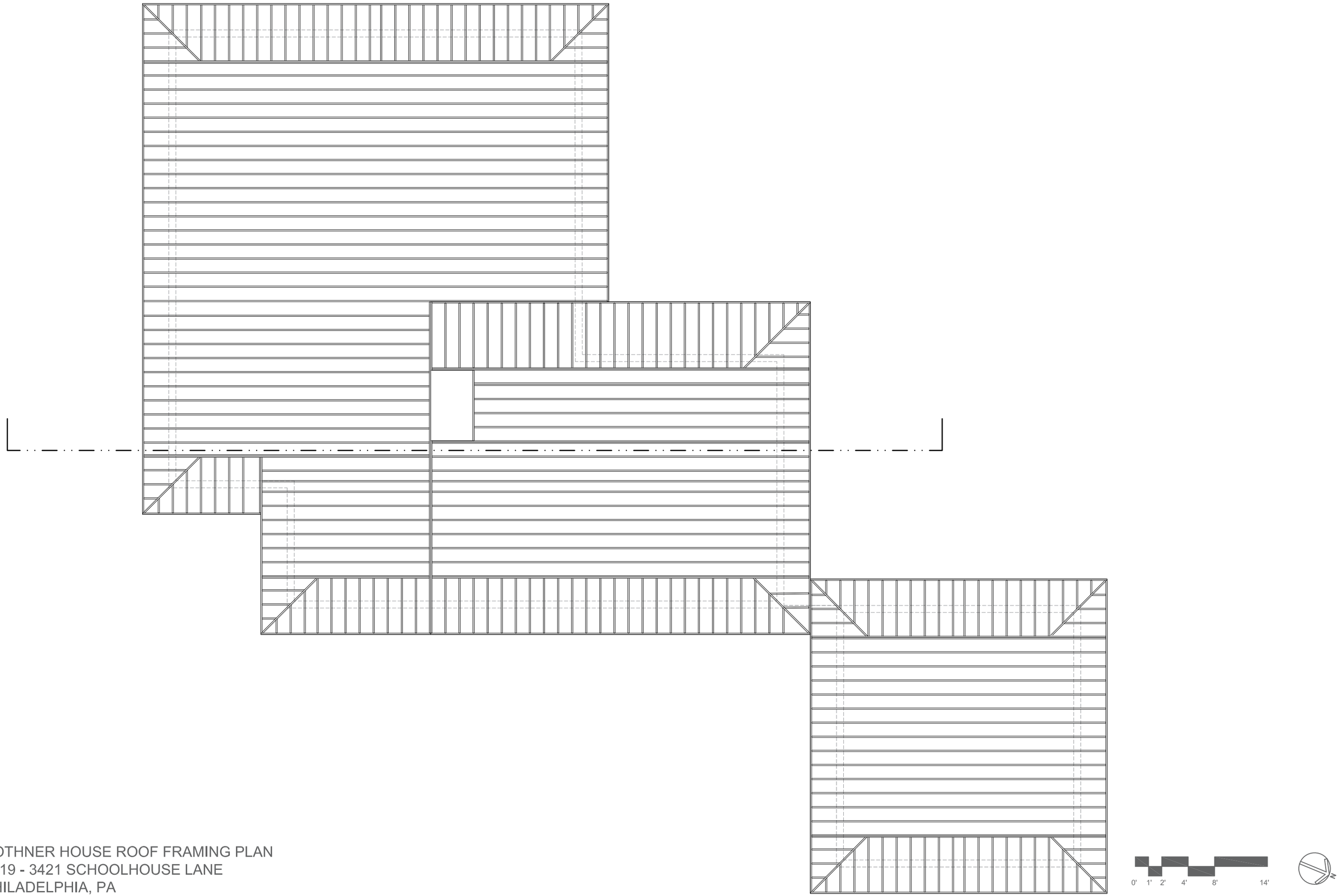
DN

LOW-SLOPE ROOF

C

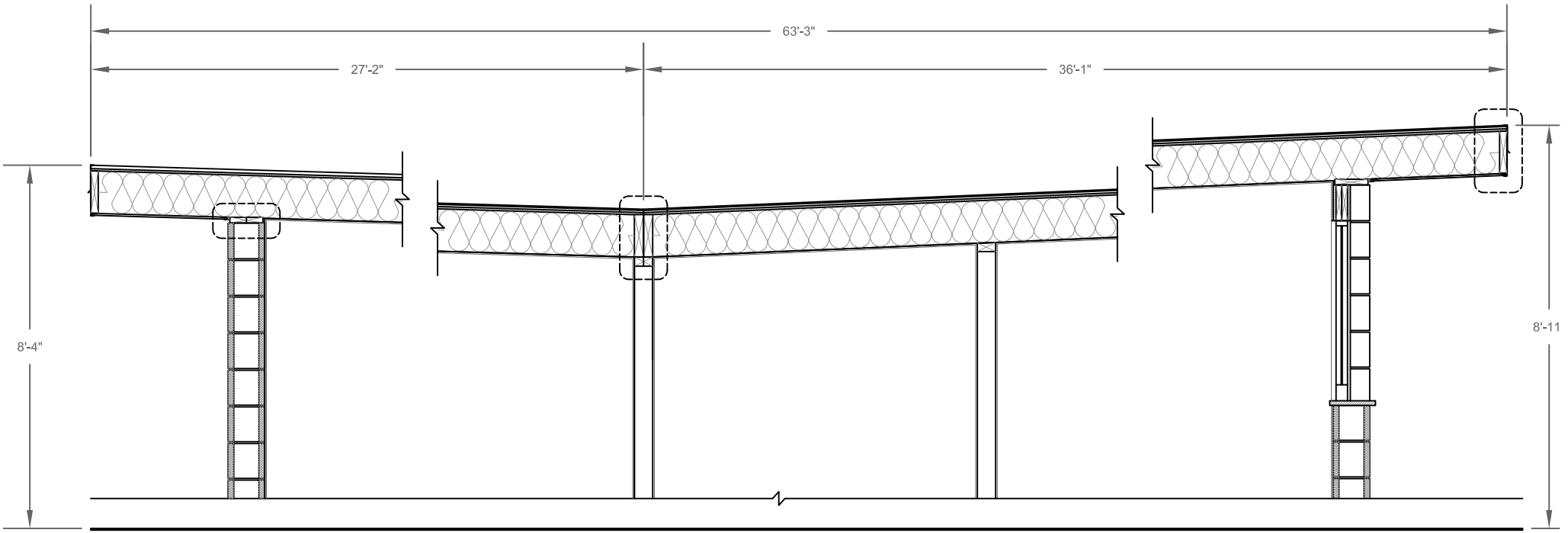
0' 1' 2' 4' 8' 14'

ROTHNER HOUSE ROOF FRAMING PLAN
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA



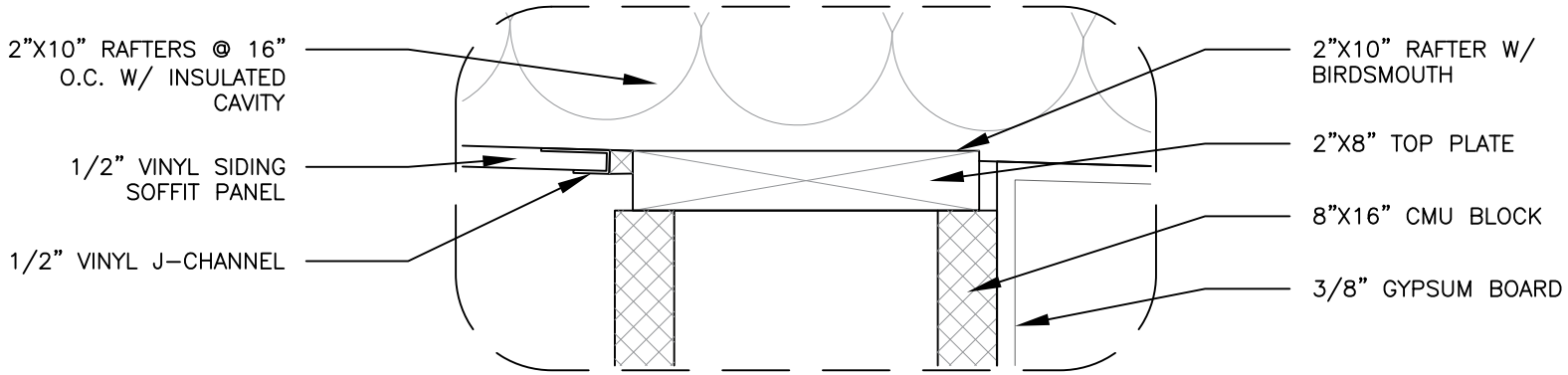
ROTHNER HOUSE ROOF FRAMING PLAN
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA

0' 1' 2' 4' 8' 14'

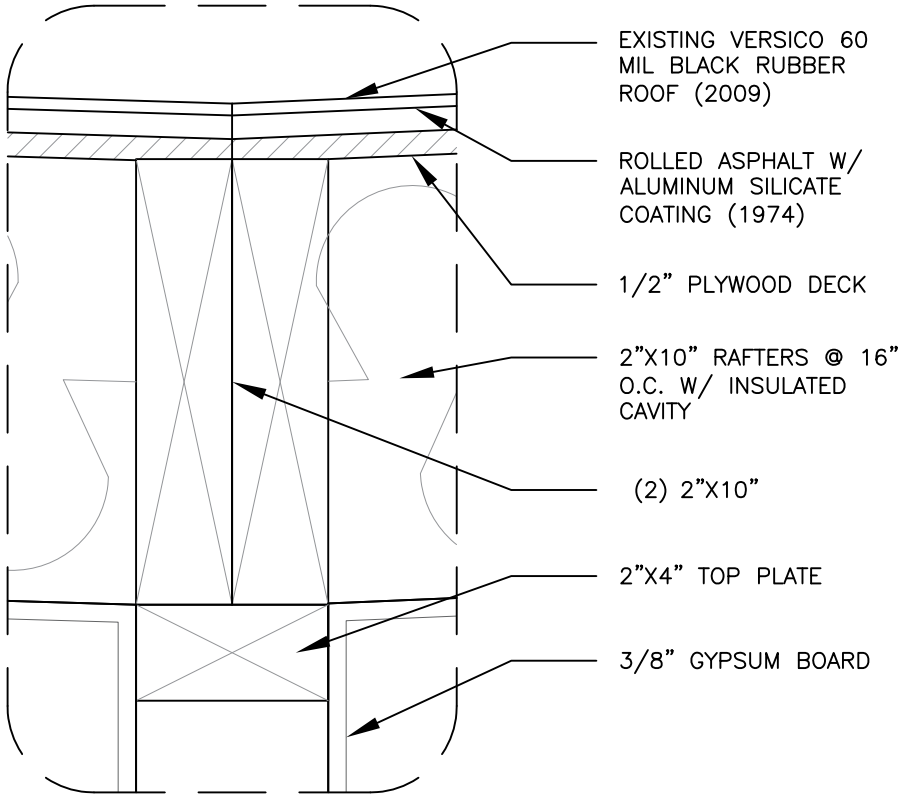


BUTTERFLY ROOF SECTION

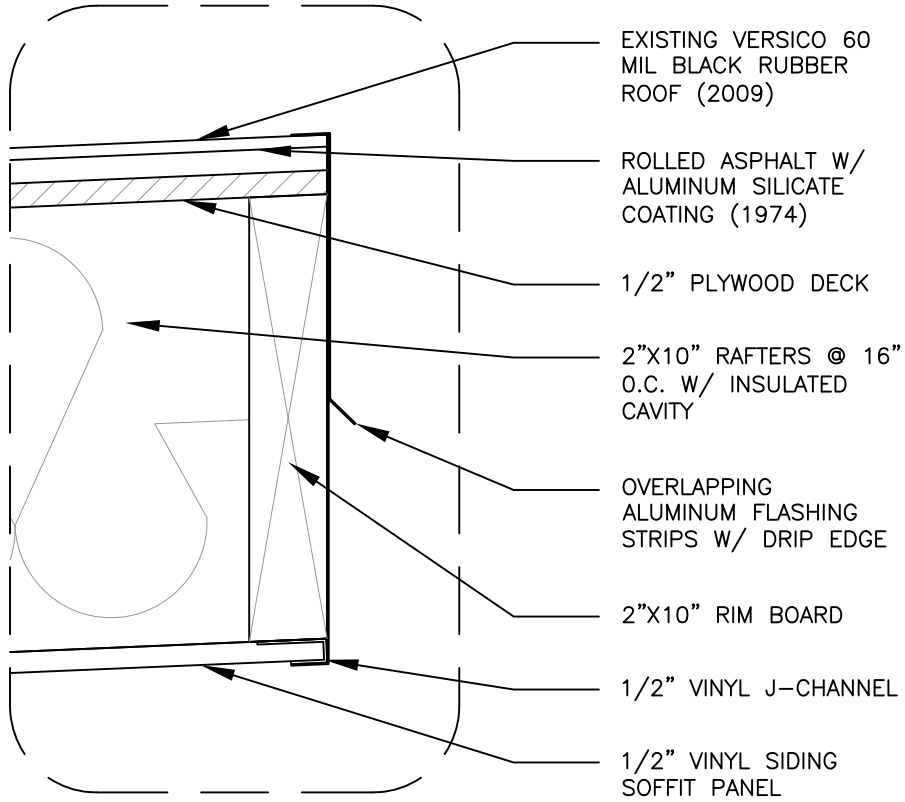
3/8"=1'-0"



1 TOP PLATE DETAIL
3"=1'-0"



2 ROOF VALLEY DETAIL
3"=1'-0"



3 EAVE DETAIL
3"=1'-0"

Rothner Residence

Energy Audit and Sustainability Study

Alison Eberhardt

Spring 2020

Introduction

The twenty-first century has seen a revolution in the architecture and construction industries. From building design to construction, all aspects of creating a building have begun to be questioned with regards to their sustainability. Even building codes have begun to take sustainability into account. New tools and technologies have assisted architects and builders to comply with codes to build new, more efficient, and sustainable structures. Building Information Modeling, or BIM, helps architects to analyze the insulation of a building envelope or the performance of a new HVAC system before the building is even constructed. With all these new technologies focused on designing new sustainable buildings, has the industry forgotten about existing structures, especially the historic ones?

Existing structures, especially historic structures, those over fifty years old, are seen as draft and inefficient. This is partially true, especially if the structure has been abandoned or has not been maintained, though this addresses another point in overall building design and maintenance, sustainable or historic structures. In all buildings, systems still break down and require tuning or maintenance, and materials still have a lifespan to consider. Architecture is not a “one-and-done” process that stops after the building is constructed. This ideology helps to explain the reasoning for adapting existing structures to new uses and new sustainability standards. The most sustainable building is the one that has already been built.

Purpose for the Study

The purpose of this study is to analyze the energy efficiency and overall sustainability of the Rothner Residence, located at 3419 – 3421 West Schoolhouse Lane in East Falls, Philadelphia. The Rothner Residence was designed for Dr. Jacob T. Rothner and his wife Leia by architect Norman Rice in 1948 - 1951.[1] The house is currently occupied by architect Janet Grace, who nominated the structure to the Philadelphia Register of Historic Places in 2010.

This study will use existing sustainable building codes and guidelines to provide recommendations for sustainable improvements to the existing Rothner Residence. Recommendations will be primarily focused in the heating or cooling, electric, or plumbing aspects of the house. Existing structures are limited in that, unless you want to completely tear the structure down and rebuild it, you cannot greatly affect the performance of the envelope. There are boundaries that sustainable adaptations must operate in with regards to existing structures, especially historic structures.

Referenced Guidelines

This study referenced three guidelines when researching sustainable conversion strategies for existing and historic structures; *LEED Guidelines 2009 Existing Buildings and Maintenance, Secretary of Interior's Standards for Rehabilitation, Guidelines on Sustainability for Rehabilitating Historic Buildings,* and *Passive House PHIUS+2015*. The Energy Star Home Assessment Tools and Home Yardstick were also used to analyze the existing performance of the Rothner Residence.

The Secretary of Interior's Standards for Rehabilitation includes specific guidelines on how to choose sustainable building materials and strategies with regards to historic structures. These guidelines are known as *The Guidelines on Sustainability for Rehabilitating Historic Buildings* and they are structured similarly to the *Secretary of*

[1] Janet Grace, Nomination of Historic Building, 3421 W. Schoolhouse Lane (Philadelphia Historical Commission, 2010).

Interior's Standards. The guidelines are broken into sections based on portions of the building (foundation, walls, windows, doors, roofs, interiors, etc.) and each provides strategies for sustainable techniques one could use in adaptive reuse. Most of the recommendations are similar to common sustainability standards; use low-e glass or film to reduce solar heat gain, insulate unfinished spaces like attics or crawl spaces and reduce air infiltration for a tight envelope. However, the difference between the Secretary of the Interior's Sustainability Guidelines and other sustainability guidelines is that they prioritize keeping the preservation of historic materials, especially on the interior of the building, intact. Strategies that are mentioned include retrofitting historic windows before replacing them, using ductless HVAC systems, and even minimalizing the impact of a solar array with regards to historic viewsheds. These guidelines help balance sustainable interventions with preserving the historic character of a structure.[2]

The next set of sustainable guidelines that was consulted for this study was the *LEED 2009 Existing Building and Maintenance*. The LEED system is guided by a checklist that awards points based on how many sustainable interventions a building or site uses. Although LEED has a reputation for assigning point values to less effective strategies, like installing bicycle racks, the checklist is a good point to start in analyzing how an existing structure is already performing. The checklist is broken into seven categories, though the site, water, energy, materials, and air quality categories are the most relevant for the Rothner Residence and where it can be improved. One benefit of LEED is that it takes site strategies, not just the built structure.[3]

The last set of guidelines consulted for the Rothner Residence energy audit was the *Passive House* guidelines (PHIUS+2015). Passive House emphasizes well-insulated and well-sealed homes, which can be challenging to obtain unless your structure is thermally balanced with regards to its heating and cooling systems. The Passive House

[2] "The Secretary of the Interior's Standards", National Parks Service, accessed May 11, 2020, https://www.nps.gov/tps/standards.htm.
[3] "Guide to Certification: Homes", U.S. Green Building Council, accessed May 11, 2020, https://www.usgbc.org/tools/leed-certification/homes.

standards are more challenging than even LEED Platinum guidelines, though they do use some of the same basic sustainability recommendations, like building with sustainably-sourced materials or using energy-efficient windows. The system also uses its own unique scale to grade structures, the RESNET HERS index, which ranks structures from 100, the worst, to 0, the best. A rank of 0 indicates a Net Zero structure, meaning it produces as much energy as it consumes. Structures can get negative number ranks, indicating a Net Positive structure, meaning the building produces more energy than it consumes.[4] Passive House and LEED are not designed for historic structures, though many of their recommendations can be considered for the Rothner Residence.

Rothner Residence Existing Systems Conditions

The Rothner Residence is a one-story, 2,060 square-foot, Mid-Century Modern house, and was constructed in 1948. It has a concrete slab-on-grade foundation, concrete block walls, and a Butterfly-design wood-framed rubber roof. The house currently has a gas boiler that powers a hot water heater, both installed in 2019, and is serviced by the City of Philadelphia for water and sewer, and PECO for its electric. According to Janet Grace, she keeps the house at about 60 degrees Fahrenheit year-round.[5]

Heating

The Rothner Residence was originally designed with a hydronic underfloor radiant heat system throughout the entire house. When Janet Grace first bought the house in the early 2000s, she made several repairs, one of which was installing hot water baseboard radiators in the rooms where the original underfloor heating failed. About fifty percent of the original radiant floor system failed which encompassed the eastern portion of the

[4] "PHIUS+ 2018 Passive Building Standard Certification Guidebook", Passive House Institute US, published June 2019, https://www.phius.org/PHIUS+2018/PHIUS+%20Certification%20Guidebook%20v2.1.pdf.
[5] Janet Grace, interviewed by Alison Eberhardt. April 15, 2020.

building containing the Master Bedroom and additional Bedroom that Janet uses as a Workout Room.[6]

(L-R), Fig. 1: The gas boiler, installed in 2019. Fig. 2: Added baseboard radiators in the bathroom.

Underfloor hydronic radiant heat systems were very common in Mid-Century Modern homes, though historic radiant floor systems have even been attributed to the Romans. Frank Lloyd Wright was the first to popularize radiant heat systems, calling his system “gravity heat”, which included a boiler in the basement that heated copper pipes that went through the floor slab above it. Homes in Levittowns even used heated slabs. Levittown homes were constructed quickly with a slab-on-grade foundation that could be adapted into a radiant heat system. During the 1940s and 1950s, the American radiant industry was booming with the promotion of copper, wrought iron, and steel piping for underfloor systems, even installing heated driveways and sidewalks for snowmelting. However, most of these experimental systems failed within fifteen or twenty years, due to the metal piping.[7]

[6] Interview with Janet Grace, 2020.
[7] Steve Smith and Jack Sweet, “A Brief History of Radiant Heating, Radiant & Hydronics”, published June 1, 2006, https://www.pmmag.com/articles/91874-a-brief-history-of-radiant-heating.

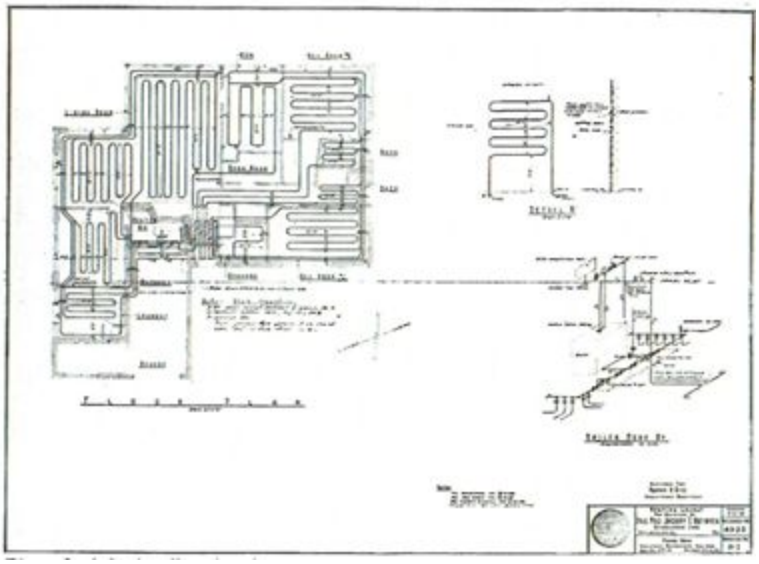


Fig. 3: The original plans for the hydronic underfloor radiant heat system in the Rothner Residence.[8]

Air Conditioning

The house has no central air conditioning. To compensate, Janet Grace installed one unit permanently in the wall of the Lounge (former Garage), and one in the window of the Living/Dining Room. According to Ms. Grace, the one unit in the window of the Living/Dining Room will cool her whole house down well during the summer.[9]

Plumbing Fixtures

Water use is an essential component of a sustainable home. Sustainable homes often use low-flow, efficient fixtures. In 2009, Janet Grace replaced all the toilets with 1.26 gallon-per-flush (GPF) fixtures and replaced all the shower heads with low-flow fixtures.[10]

[8] Janet Grace, Nomination of Historic Building, 3421 W. Schoolhouse Lane, 2010.
[9] Interview with Janet Grace, 2020.
[10] Interview with Janet Grace, 2020.

Current Usage and Performance

Janet Grace shared basic electric, water, and gas usage for the purpose of this study. Her average electric monthly use is 512 kilowatt hours (kWh). The amount of water used is about 60 gallons per day. Her water bill is about $35 dollars per month, including a $15.53 stormwater charge. The average monthly gas use is 65.42 CCF. As shown on the graph (Figure 4), her highest gas use occurs during the winter, or heating months, and her highest electric use occurs during the summer, or cooling months. This concurs with the use of her electric-powered air conditioning units during the summer, and her hot-water-powered radiant heating and baseboard systems during the winter.

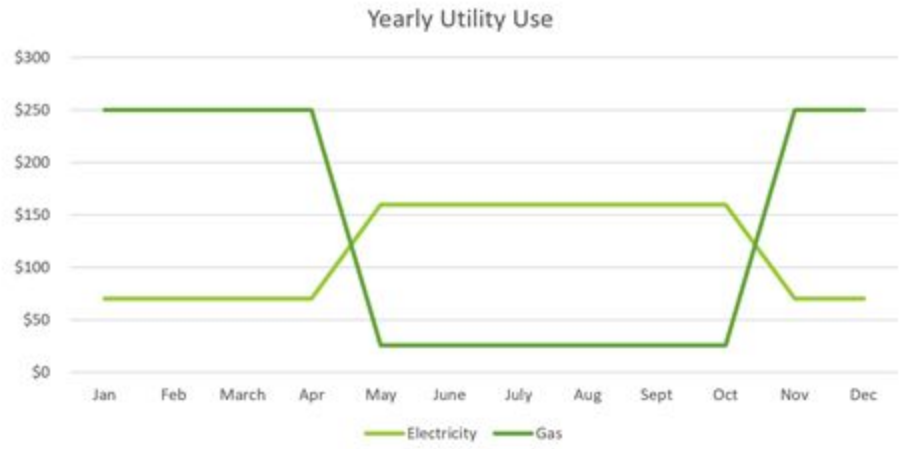


Fig. 4: Janet Grace's yearly energy use of electricity and gas plotted by her bill amounts.[11]

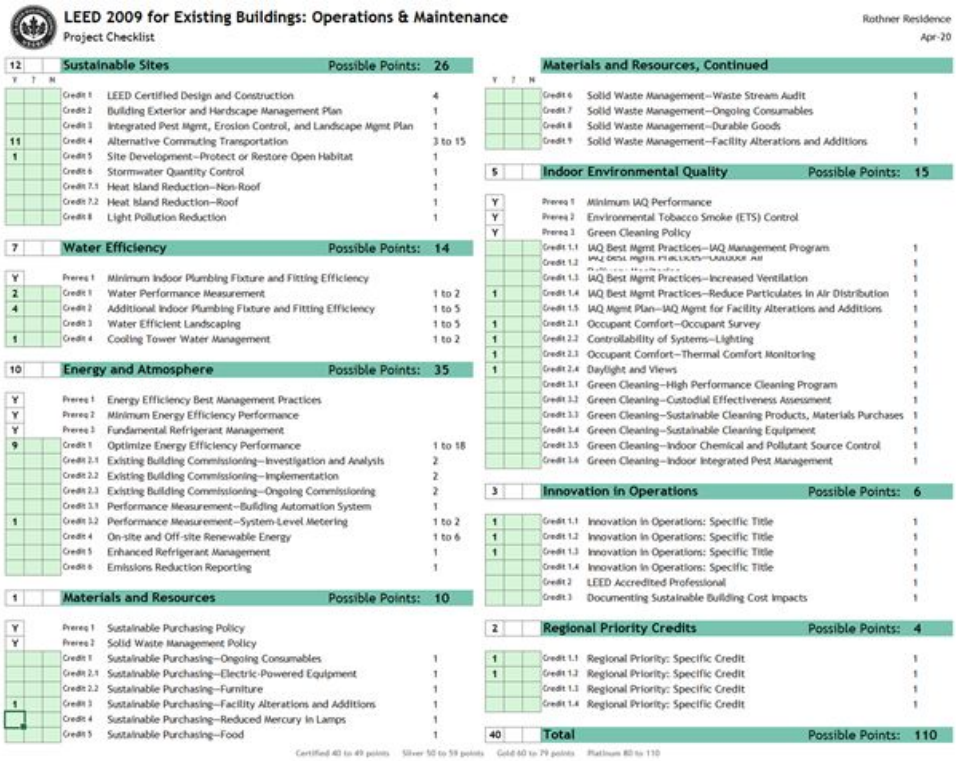
One tool that was used to measure the existing performance of the Rothner Residence was Energy Star's Home Yardstick Tool. Any homeowner can use this tool, entering their energy bills for the year and general characteristics about their home. The Rothner Residence measured a 4.5 out of 10 by Energy Star's system, with one being the worst and ten the best. After being evaluated, the system will provide a list of

[11] Interview with Janet Grace, 2020.

recommendations for the homeowner, although most of their recommendations involve buying Energy Star rated appliances and light bulbs, because of their reputation as efficient fixtures and appliances. While these recommendations can be helpful, it provides no value to homeowners who are on a budget and can't replace all their appliances. The Energy Star tool could be regarded as biased because of its emphasis on its own products. Most of the recommendations from Energy Star for the Rothner Residence was to purchase these Energy Star fixtures, and as such, will have minimal impact on this survey.[12]

Recommendations According to Specific Guidelines

LEED 2019 Existing Buildings and Maintenance



LEED 2009 for Existing Buildings: Operations & Maintenance
Project Checklist

Rothner Residence
Apr-20

Sustainable Sites			Possible Points:	26
	Credit 1	LEED Certified Design and Construction		4
	Credit 2	Building Exterior and Hardscape Management Plan		1
	Credit 3	Integrated Pest Mgmt, Erosion Control, and Landscape Mgmt Plan		1
11	Credit 4	Alternative Commuting Transportation		3 to 15
1	Credit 5	Site Development—Protect or Restore Open Habitat		1
	Credit 6	Stormwater Quantity Control		1
	Credit 7.1	Heat Island Reduction—Non-Roof		1
	Credit 7.2	Heat Island Reduction—Roof		1
	Credit 8	Light Pollution Reduction		1
Water Efficiency			Possible Points:	14
Y	Prereq 1	Minimum Indoor Plumbing Fixture and Fitting Efficiency		
2	Credit 1	Water Performance Measurement		1 to 2
4	Credit 2	Additional Indoor Plumbing Fixture and Fitting Efficiency		1 to 5
	Credit 3	Water Efficient Landscaping		1 to 5
1	Credit 4	Cooling Tower Water Management		1 to 2
Energy and Atmosphere			Possible Points:	35
Y	Prereq 1	Energy Efficiency Best Management Practices		
Y	Prereq 2	Minimum Energy Efficiency Performance		
Y	Prereq 3	Fundamental Refrigerant Management		
9	Credit 1	Optimize Energy Efficiency Performance		1 to 18
	Credit 2.1	Existing Building Commissioning—Investigation and Analysis		2
	Credit 2.2	Existing Building Commissioning—Implementation		2
	Credit 2.3	Existing Building Commissioning—Ongoing Commissioning		2
	Credit 3.1	Performance Measurement—Building Automation System		1
1	Credit 3.2	Performance Measurement—System-Level Metering		1 to 2
	Credit 4	On-site and Off-site Renewable Energy		1 to 6
	Credit 5	Enhanced Refrigerant Management		1
	Credit 6	Emissions Reduction Reporting		1
Materials and Resources			Possible Points:	10
Y	Prereq 1	Sustainable Purchasing Policy		
Y	Prereq 2	Solid Waste Management Policy		
	Credit 1	Sustainable Purchasing—Ongoing Consumables		1
	Credit 2.1	Sustainable Purchasing—Electric-Powered Equipment		1
	Credit 2.2	Sustainable Purchasing—Furniture		1
1	Credit 3	Sustainable Purchasing—Facility Alterations and Additions		1
	Credit 4	Sustainable Purchasing—Reduced Mercury in Lamps		1
	Credit 5	Sustainable Purchasing—Food		1

Materials and Resources, Continued				
	Credit 6	Solid Waste Management—Waste Stream Audit		1
	Credit 7	Solid Waste Management—Ongoing Consumables		1
	Credit 8	Solid Waste Management—Durable Goods		1
	Credit 9	Solid Waste Management—Facility Alterations and Additions		1
Indoor Environmental Quality			Possible Points:	15
Y	Prereq 1	Minimum IAQ Performance		
Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
Y	Prereq 3	Green Cleaning Policy		
	Credit 1.1	IAQ Best Mgmt Practices—IAQ Management Program		1
	Credit 1.2	IAQ Best Mgmt Practices—Outdoor Air		1
	Credit 1.3	IAQ Best Mgmt Practices—Increased Ventilation		1
1	Credit 1.4	IAQ Best Mgmt Practices—Reduce Particulates in Air Distribution		1
	Credit 1.5	IAQ Mgmt Plan—IAQ Mgmt for Facility Alterations and Additions		1
1	Credit 2.1	Occupant Comfort—Occupant Survey		1
1	Credit 2.2	Controllability of Systems—Lighting		1
1	Credit 2.3	Occupant Comfort—Thermal Comfort Monitoring		1
1	Credit 2.4	Daylight and Views		1
	Credit 3.1	Green Cleaning—High Performance Cleaning Program		1
	Credit 3.2	Green Cleaning—Custodial Effectiveness Assessment		1
	Credit 3.3	Green Cleaning—Sustainable Cleaning Products, Materials Purchases		1
	Credit 3.4	Green Cleaning—Sustainable Cleaning Equipment		1
	Credit 3.5	Green Cleaning—Indoor Chemical and Pollutant Source Control		1
	Credit 3.6	Green Cleaning—Indoor Integrated Pest Management		1
Innovation in Operations			Possible Points:	6
1	Credit 1.1	Innovation in Operations: Specific Title		1
1	Credit 1.2	Innovation in Operations: Specific Title		1
1	Credit 1.3	Innovation in Operations: Specific Title		1
	Credit 1.4	Innovation in Operations: Specific Title		1
	Credit 2	LEED Accredited Professional		1
	Credit 3	Documenting Sustainable Building Cost Impacts		1
Regional Priority Credits			Possible Points:	4
1	Credit 1.1	Regional Priority: Specific Credit		1
1	Credit 1.2	Regional Priority: Specific Credit		1
	Credit 1.3	Regional Priority: Specific Credit		1
	Credit 1.4	Regional Priority: Specific Credit		1
40	**Total**		Possible Points:	110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Fig. 5: LEED Checklist for the Rothner Residence as it currently stands.

[12] "Energy Savings at Home", Energy Star, 2020, https://www.energystar.gov/campaign/assessYourHome?s=mega.

Above (Figure 5) is the LEED Checklist for the Rothner Residence in its existing condition, which, as it stands, the Rothner Residence is LEED Certified. The categories most specific to the Rothner Residence are site, water, energy, materials, and air quality. Many of the LEED points are concerned with resident lifestyle and making maintenance plans for the structure, like a pest control plan or a hardscape management plan.

One of the biggest recommendations from the LEED Checklist pertained to the site and reducing the heat island effect of the site, which occurs when dark surfaces absorb and reflect heat from the sun back into the atmosphere. Dark roof materials also contribute to the heat island effect, in which the Rothner Residence does have a black rubber roof. The next time the roof needs to be replaced, a lighter-colored roof would be recommended, or, if the structure could support it, a shallow green roof could also suffice to reduce the heat reflected off the roof. Planting water-efficient plants is also an aspect LEED takes into consideration.

The second most impactful aspect of the LEED checklist is energy efficiency. Efficient LED lightbulbs could be swapped with the existing bulbs, along with light sensors to turn off lights in rooms that aren't in use. Automated building systems, a technique recommended by LEED and other sustainable guidelines, includes a programmable thermostat that is turned down overnight or when the occupants are gone. Energy efficiency also considers where a home gets its electric service from and how that electricity is created. Homeowners can call their electric company and ask how much of their electricity is generated from renewable sources. According to the federal government, Pennsylvania ranks second in nuclear power generation in the United States. In 2018, almost five percent of the state's power was generated from renewable sources, mostly wind turbines. Solar power accounts for only five percent of the total power generated by Pennsylvania's renewable sources, however, four-fifths of the total

solar power is generated from smaller-scale installations, like small arrays on the roofs of homes.[13]

Solar Array Calculations for the Rothner Residence

Per LEED Guidelines, renewable energy sources were considered as part of this energy survey. The calculations performed are outlined below, double-checked by a contractor website that can calculate the number of solar panels needed based on roof area and energy usage.

Average Energy Useage = 512 kWh

512 kWh / 30 = 17 kWh /day

Insolation rate for Philadelphia (how intense the Sun is on average) = 4.75

17 kWh / 4.75 = 3.58 kWh needed from solar array per day

3.58 kWh x 1.3 (loss in panel efficiency) = 4.65 kWh needed to produce per day

One solar panel produces about 200 W

4.65 kWh x 1000 / 200W = **24 panels needed**

[13] "Pennsylvania State Profile and Energy Estimates", U.S. Energy Information Administration, 2020, https://www.eia.gov/state/analysis.php?sid=PA.

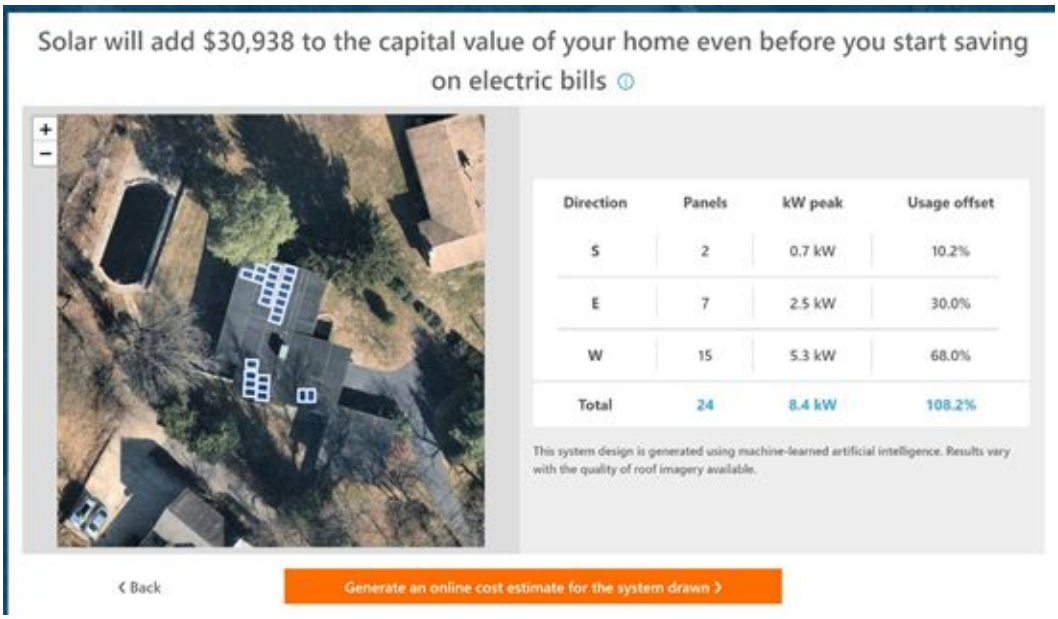


Fig. 6: Online solar panel calculator used to double check calculations.[14]

Passive House (PHIUS+2015)

Passive House, like LEED, uses a checklist divided into categories to rank houses on their overall efficiency and sustainability, though the Passive House checklist includes more detail than the LEED checklist. The checklist devotes an entire section to Energy Star ratings, in addition to electricity, lighting, ventilation, and similar categories of the LEED checklist. A Passive House exam relies on post-construction and pre-occupancy testing, like a blower door test, for example. A blower door test draws all air from inside the house and sensors placed inside test how long the house can stay at that air pressure and temperature, indicating how insulated and sealed the home is. This aspect was one of the drawbacks in referencing the Passive House guidelines for this study; the field testing required for it was not able to be performed. Another drawback to consulting the Passive House checklist is that the Passive House system assumes and operates from the basis that a home uses a forced-air heating and cooling system, which the Rothner Residence does not. However, some recommendations were taken from the Passive House checklist.[15]

[14] "Solar Estimate", accessed April 11, 2020, https://www.solar-estimate.org/solar-panel-calculators.
[15] "PHIUS+ 2018 Passive Building Standard Certification Guidebook", Passive House Institute US, published June 2019, https://www.phius.org/PHIUS+2018/PHIUS+%20Certification%20Guidebook%20v2.1.pdf.

Survey Limitations

This survey was limited by several factors, largely the COVID-19 pandemic, that limited in-person building analysis.

Another limitation faced by this survey was the access of tools and programs used in energy audits. The auditor and author of the paper is a graduate student, attempting to study a house using free programs available to students. BIM modeling is a useful tool in sustainable design, though not much is accessible to students.

If there was more time for on-site analysis, a thermal camera would have been the next step to this survey. A thermal camera could detect “leaks” in the building envelope and could analyze the impact of removing the exterior storm panes from the windows. A blower door test could also be performed if the equipment, and competent professionals, could be obtained.

Conclusion

Sustainable recommendations are useful for every structure, though thought and care need to be exercised when applying these recommendations to historic structures. Below, the table outlines recommendations from this report, referenced from sustainable guidelines, and how the Secretary of the Interior’s Standards view each sustainable measure.

Overall, the Rothner Residence is an efficient structure and is currently LEED Certified. This is due to its double-glazed windows and efficient hydronic radiant heat system, though a system’s energy performance can always be improved, especially if the Rothner Residence is to last another fifty years.

Sustainable Intervention Suggested	Secretary of the Interior's Guidelines on Sustainability	Conclusion Based on Both Guidelines
Planning and Design		
The purpose of this study is to analyze the energy efficiency and overall sustainability of the Rothner Residence. This study will use existing sustainable building codes and guidelines to provide recommendations for sustainable improvements to the existing Rothner Residence.	Identify ways to reduce energy use, such as installing fixtures that conserve resources, before undertaking more invasive treatments that may negatively impact the historic building.	This study fulfills the important first step in the sustainable design or adaptive reuse in any building, existing, new, or history.
Maintenance		
LEED Sites Credit 3 emphasizes management plans**.** LEED Air Quality Credit 3.1 – 3.6 emphasizes green cleaning with sustainable products.	Maintain historic buildings regularly. Use environmentally friendly cleaning products that are compatible with historic finishes.	This is the goal of the larger Conservation Management Plan of which this study is a part of. Decide now how to treat the historic building in the future.
Windows		
LEED Sites Credit 3 emphasizes management plans**.**	Maintaining windows on a regular basis to ensure that they function properly and are completely operable.	Janet Grace currently cleans the windows with aluminum jelly, though it is not necessary to improve the efficiency of the windows. Consult the greater CMP document to consider alternatives to keeping the windows operable.

LEED Air Quality Credit 1.3 emphasizes increasing ventilation. PHIUS suggests designing with efficient window units, double or triple glazed.	Installing interior or exterior storm windows or panels that are compatible with existing historic windows.	The storm panels on the Rothner Residence ultimately contribute to its current efficient performance. Loss of the panels will decrease the efficiency of the units, in addition to removing historic fabric, an original feature of the windows. The alteration is not approved according to the Secretary of the Interior's Standards. However, if a future owner wants to remove the storm panels, and add window screens, a high-performance clear film would be suggested to combat the loss of the glazing layer. Window screens attached the same way as the storm panels would not damage the historic glazing units.
LEED Air Quality Credit 2.4 emphasizes Daylight and Views	Retrofitting historic windows with high-performance glazing or clear film, when possible, and only if the historic character can be maintained.	
Weatherization		
PHIUS has stricter standards with regards to insulation, based on pre-occupancy testing. LEED Air Quality Credit 2.1 emphasizes an occupant survey.	Eliminate infiltration first, beginning with the least invasive and most cost-effective weatherization measures, such as caulking, before undertaking more invasive weatherization measures.	Janet Grace was surveyed and claims the house is comfortable. A blower door test and thermal camera survey are recommended as future work, to test the weatherization of the house.
Insulation		
PHIUS has stricter standards with regards to insulation, based on pre-occupancy testing. LEED Air Quality Credit 2.1 emphasizes an occupant survey.	Ensure that air infiltration is reduced before adding wall insulation. Install appropriate wall insulation, only if necessary, after lower impact treatments have been carried out.	If the future blower door test and thermal camera survey find "leaks" and they are not solved by minimal weatherization methods, insulation may be needed.

HVAC		
	Retaining and maintaining functional and efficient HVAC systems.	
	Supplementing the efficiency of HVAC systems with less energy-intensive measures, such as programmable thermostats, attic and ceiling fans, louvers and vents, where appropriate. Retaining or installing high efficiency, ductless air conditioners when appropriate.	
	Investigating whether a geothermal heat pump will enhance the heating and cooling efficiency of the building before installing one.	
Solar Technology		
Solar panel array design was considered as part of this survey.	Analyze whether solar technology can be used successfully and will benefit a historic building without compromising its character or the character of the site or the surrounding historic district. If so, install a low-profile solar device on the historic building so that it is not visible or only minimally visible from the public right of way: for example, on a flat roof and set back to take advantage of a parapet or other roof feature to screen solar panels from view; or on a secondary slope of a roof, out of view from the public right of way.	The addition of a solar array would benefit the Rothner Residence and its inhabitants by decreasing their energy bill and their effect on the planet.

Wind Power		
LEED and PHIUS both consider sustainable energy-generation measures (LEED Energy Credit 4).	Analyzing whether wind-power technology can be used successfully and will benefit a historic building without compromising its character or the character of the site or the surrounding historic district.	Wind power is not considered the most effective source of power for this site, unless it was generated off-site. A solar panel array would suit the structure better and cause less of an impact on the historic character of the building.
Roofs		
LEED Site Credit 7.2 – Heat Island Reduction, Roof.	Retaining and repairing durable, character-defining historic roofing materials in good condition.	The black rubber roof currently on the house is not the original historic roofing material (refer to the greater CMP document).
LEED Site Credit 7.2 – Heat Island Reduction, Roof.	Analyzing whether a cool roof or a green roof is appropriate for the historic building.	Although the black roof absorbs heat into the atmosphere, the roof does not urgently need to be replaced. When the roof next needs to be replaced, a lighter-colored roof material, like a white or gray, should be used to reduce the heat island effect of the site. However, if the current roof structure allows it, a shallow green roof with smaller-root plants could be an optional strategy to reduce the absorption of energy by the roof.
LEED Site Credit 6 – Stormwater Quality Control.	Ensuring that the roof is watertight and that roof drains, gutters and downspouts function properly before installing a green roof.	The downspouts need to be repaired on the structure (see the CMP).

Site Features and Water Efficiency		
LEED Site Credit 3 – Integrated Pest, Erosion, and Landscape Management Plan LEED Site Credit 7.1 – Heat Island Reduction, Non-Roof	Avoiding paving up to the building foundation to reduce heat island effect, building temperature, damage to the foundation and storm-water runoff.	Currently, asphalt paving extends against three of the walls of the house, with stone patio paving abutting two of the rear walls of the house. The benefits of decreasing the heat island effect and damage to the foundation outweigh the possible damage to the foundation that chipping away the asphalt could cause.
LEED Site Credit 3 – Integrated Pest, Erosion, and Landscape Management Plan LEED Water Credit 3 – Water Efficient Landscaping	Landscaping with native plants, if appropriate, to enhance the sustainability of the historic site.	According to the CMP, Norman Rice did not have a major part in designing the landscape around the Rothner Residence. Much of it has already been changed with the addition of the attached garage. Therefore, more sustainable design aspects can be taken into account for the site without worrying about damaging historic landscape fabric. However, the vantage point of the house from Schoolhouse Lane should still be preserved. It is also important to note that the house is located in the Wissahickon watershed and may have some landscaping or building restrictions.
LEED Site Credit 3 – Integrated Pest, Erosion, and Landscape Management Plan	Adding features, such as bioswales, rain gardens, rain barrels, large collection tanks and cisterns, if compatible, to the historic building site to enhance storm-water management and on-site water reuse.	
Daylighting		

LEED Indoor Quality Credit 2.4 – Daylight and Views	Adding skylights or light tubes on secondary roof elevations where they are not visible or are only minimally visible so that they do not negatively impact the building's historic character.	Some areas, like the hallway or bathrooms, may benefit from more natural light. Light tubes and minimally invasive on the roof profile of the house and can bring more natural light inside.
LEED Indoor Quality Credit 2.2 – Controllability of Systems – Lighting	Installing automated daylighting controls on interior lighting systems that ensure adequate indoor lighting and allow for energy-saving use of daylighting.	Daylight sensors are minimally-invasive systems that can conserve energy. Sensors can tune lights based on how much daylight enters a room or turn lights off based on movement sensors.

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Rothner Residence

Maintenance Plan

Grace Messner

Spring 2020

Introduction

Maintenance helps preserve the integrity of historic structures. If existing materials are regularly maintained and deterioration is significantly reduced or prevented, the integrity of materials and workmanship of the building is protected. Proper maintenance is the most cost-effective method of extending the life of a building. As soon as a building is constructed, restored, or rehabilitated, physical care is needed to slow the natural process of deterioration. An older building has already experienced years of normal weathering and may have suffered from neglect or inappropriate work as well.

Decay is inevitable but deterioration can accelerate when the building envelope is not maintained on a regular basis. Surfaces and parts that were seamlessly joined when the building was constructed may gradually become loose or disconnected; materials that were once sound begin to show signs of weathering. Deferring regular maintenance and repairs may cause irreparable damage to the historic fabric and character of the building. Understandably, immediate repairs may be too costly to undertake when they are discovered but should be addressed as thoroughly as possible as funds become available. Ideally, historic buildings should only require preventative maintenance, but building failures do occur. When the root causes of failure are diagnosed, repairs should follow with the least possible amount of intervention. Repairs may occasionally include limited material replacements. Ideally, extensively deteriorated or missing materials, components, and systems should only be replaced with the same materials. Because this approach is not always economically or technically feasible, compatible substitute materials may be considered under certain circumstances, like removal of deteriorated lead paint or asbestos tile.

This maintenance plan is divided into several sections in order to facilitate ease of use. This first section outlines the materials on the building, both interior and exterior, and identifies the significance of the material to the character of the building, followed by a list of typical issues and a discussion of appropriate maintenance techniques for each material and required supplies for maintenance. The end of the report is a maintenance log document with each maintenance task listed in order of its frequency, with locations to indicate condition and notes about each maintenance task.

Care and Cleaning of Historic Finishes

The utmost care must be taken when maintaining historic finishes on a historic building. There are several guiding principles which should be observed when cleaning historic finishes.

1. Use the gentlest means possible and the gentlest products possible in cleaning historic materials so as not to damage an underlying finish or substrate. Locate as much information as possible about recommended care and cleaning products and applications before selecting a cleaning product or method.
2. Spot test all cleaning products and methods in an inconspicuous location. Visually inspect for adverse effects or damage resulting from the cleaning. Document the conditions before and after the testing by taking photographs and notes.
3. After selecting an effective non-damaging cleaning process and product, record the information about the testing process, results, product used, cleaning procedure, and cleaning schedule in the provided maintenance log. It may initially be difficult to determine the best frequency of cleaning, but by routinely monitoring the effectiveness of the product and procedure used, experience will be gained over time. If necessary, cleaning schedules should then be adjusted to consider the patterns of use of the structure and general wear of the materials.

Exterior

Roof

The roof is designed as a weather-repellant barrier which directs water and debris to flow off of the roof and into functional gutters and downspouts, and away from the foundation of the building. One of the main objectives of maintaining a roof is to prevent water from infiltrating the building, as this can result in the growth of mold, along with deterioration of structural and interior elements. Roof construction often involves far more than just the material which covers the majority of the roof, and also requires routine inspection of flashing and surrounding foliage. The roof of the Rothner Residence is primarily a black rubber coating, with metal flashing located at the chimney and edges of the roof, where the rubber material ends. The butterfly roof shape is one of the most prominent character-defining features of the house, and the entire roof should be cared for as such.

Inspection

When inspecting the roof and associated systems for damage and deterioration, there are several tools which may be useful in identifying issues. Many issues pertaining to drainage can be observed without climbing onto the roof, so a pair of binoculars or a decent digital camera may serve to provide larger and more detailed views of drainage conditions and flashing at the edge of the roof. For more detailed inspections, a stable ladder may be erected on a flat section of the surrounding grade for access to the roof. An experienced roofer should be consulted if any problems appear.

<u>The roof and associated systems should be inspected for the following issues:</u>

- Sagging and deteriorated roof material, including missing, cracked, buckling, bubbling, peeling, or delaminated material
- Ponding of water
- Debris accumulation
- Overhanging foliage which may rub against the roof or gutters, or damage the roof during a weather event
- Organic growth, including sprouting plants, moss, and mold
- Deteriorated flashing and failing connections at intersections of roof slopes, and of roof material and chimney

- Misaligned or damaged elements
- Old, loose, or crumbling roof sealant
- The chimney should be inspected for the following issues:
- Dislodging of or damage to chimney cap
- Missing or damaged masonry and associated mortar, including spalled or cracked mortar
- Accumulation of ash and other debris
- The gutters should be inspected for the following issues:
- Debris buildup due to fallen leaves
- Cracks or leaks which prevent adequate draining
- Sagging gutters, broken gutter clips, or any other disturbance which may affect adequate draining of water from the roof

Maintenance

Ideally, regular inspection and periodic maintenance should prevent significant problems from arising in association with the roof, flashing, chimney, and drainage systems. The type of maintenance required for a roof varies heavily based on the material of the roof. For the purposes of this maintenance guide, the recommended maintenance is based on the materials which are currently on the house, including the rubber roof, metal flashing and gutter system, and the masonry chimney.

Roof and Flashing

- Broom sweep branches and debris away from valleys and seams where it may accumulate, particularly around the chimney flashing and the seam where the two roof slopes meet. Begin from the high point of the roof and work down.
- Remove biological growth where it is causing erosion of roofing material using a garden hose and scrubbing brush. Using a putty knife or other scraping tool is acceptable in areas of more dense buildup.
- Once these materials are removed, a mixture of warm water and dishwashing soap may be used to remove any leftover mildew or dirt.
- Re-secure any loose flashing around the edges of the roof and the chimney. Replace any flashing which is deteriorated. Replacement flashing should match existing material. Be sure to clean out old mortar, lead wool, or other fastening material, and ensure that flashing is properly secured onto new fastening material. Avoid using sealant to attach flashing.
- Reseal any deteriorated, loose, or crumbling roof sealant with a new sealant approved for use on EPDM and rubber roofing.
- Trim adjacent foliage and branches in order to increase the amount of sunlight on the roof surface, as this will deter further organic growth and damage to the roof surface.

Chimney

- Repairs to chimneys and caps should be performed by a professional.
- Annual chimney cleaning and inspection by a certified chimney sweep.
- Repoint joints in chimneys using a hydraulic lime mortar or other suitable mortar where the existing mortar has eroded, cracked, or spalled to prevent moisture penetration. In general, use of a mortar which is slightly weaker than the existing mortar is best, to allow trapped moisture to migrate out of the mortar instead of damaging the masonry, which can cause spalling.

Gutters

- Remove leaves and other associated debris from all gutters and downspouts. Use a garden hose to flush out downspouts and ensure their operation.
- Patch or repair holes in gutters and downspouts using fiberglass tape or epoxy adhesive. Always spot test repair material first to ensure it does not cause further deterioration.
- The best time to clean gutters and downspouts is during autumn or late winter after all nearby trees have shed their leaves. Typically, gutters should be cleaned out twice a year, but often roof drainage will need more frequent cleaning during the spring and fall.

Exterior Walls

Exterior walls serve to prevent water infiltration and to insulate the house. The primary objective of maintenance for the exterior walls is to prevent water infiltration, insect and animal infiltration, and deterioration of the walls and associated coatings. The walls of the Rothner Residence are primarily constructed of CMU, with stucco parging on the exterior surface which covers the vertical seams of the CMU and creates a smooth and even horizontal groove which follows the horizontal grooves of the CMU but does not indicate the seams between individual blocks. This parging is coated in an elastomeric coating in one of three colors: black, white, or red.

Inspection

It is best to inspect walls during dry as well as wet weather. Monitoring the interior wall for moisture or other potential problems is important as well. Look for movement in cracks, joints, and around windows and doors and try to establish whether movement is seasonal in nature.

Exterior walls should be inspected for the following issues:

- Cracks, spalling, etc. in CMU walls and mortar joints, particularly around openings such as doors and windows
- Evidence of rising damp, a condition where moisture rises from grade into the wall material, and may present itself as staining or efflorescence of salts in the bottom 1-3' of the wall which is in contact with grade
- Damage or insect/animal infiltration around the areas of spigots, electrical outlets, and vents
- Excessive dampness or bubbling of elastomeric coatings, which may suggest moisture collecting behind the coatings
- General coating problems, including cracked or peeling paint
- Organic growth, suggesting moisture is present in the wall
- Condition of parging, including spalling or damaged parging

Maintenance

Regular inspection and periodic maintenance should prevent significant problems from arising in association with the exterior walls and associated coatings.

CMU Walls with Parging and Elastomeric Coating

- Trim plantings away from wall surfaces, and remove all climbing plants such as ivy to prevent moisture infiltration and damage to coatings.
- Wash exterior wall surfaces with low-pressure water and a stiff brush or broom. Add mild phosphate-free detergent if necessary. Avoid use of abrasive methods such as scraping, or any kind of blasting techniques such as sand blasting or soda blasting, as these will likely damage the elastomeric coating and wall surface beneath.
- Where patching is required, select a compatible patch material, similar to existing parging, and place patching based on manufacturer's recommendations.
- Prep, prime, and spot paint areas which may need the elastomeric coating touched up. Ensure compatibility between new and old elastomeric coatings by spot testing in an inconspicuous area.
- Remove all deteriorated or loose sealants and caulks and reapply appropriate sealants and caulks using backer rod where necessary
- Repair or replace damaged spigots, light fixtures, and electrical outlets as needed

Openings

Openings in walls such as windows and doors provide the connection between interior and exterior spaces, and are therefore one of the prime locations for deterioration and maintenance needs. Water and air infiltration are common problems when it comes to openings, and these issues can often go ignored for long periods of time, costing extra money in utilities over many years. Although the openings for the windows are not at high risk for damage because of the nature of the CMU walls, the openings should be routinely inspected for damage or deterioration. The openings on the Rothner Residence are primarily original aluminum Cupples windows, with a few replacement windows, and several metal doors, as well as a garage door on the detached garage. The metal doors and garage door are painted, but the windows remain unpainted.

Inspection

The openings on the building should be inspected for the following issues:

- Loose frames or inoperable windows, suggesting a change in the orientation of the window within the opening
- Drag marks on thresholds from poorly fitting doors or damaged hardware
- Loose or damaged hardware
- Deteriorated weatherstripping, window gaskets, window glazing or putty, and flashing
- Broken, chipped, or cracked glass
- Peeling paint, corrosion or rust stains
- Debris accumulation, insect and/or animal infiltration and associated debris
- Damaged or missing weatherstripping
- Pooling water near openings

Maintenance

Ideally, regular inspection and periodic maintenance should prevent significant problems from arising in association with the windows and doors into the building. Because of the age of the house, the aluminum windows may present a coating of oxidization because of exposure to external conditions. This coating of oxidization is protective and it is not necessary to remove it.

- Replace broken or missing glass. Where panes with a distinct appearance are damaged, specialty glass may be required.
- Reputty window glazing where putty is deteriorated or missing. Re-glaze with either traditionally formulated oil putties or modern synthetic ones, making sure to properly bed the glass and secure it with glazing points.

- Clean window and door glass using a mild, non-alkaline commercial window cleaner. Avoid pressure washing, Gentle, low-pressure washing with a hose may be desirable in cases of extreme debris accumulation in exterior window tracks. Dry well with a cloth after cleaning.
- Clean hardware and handles when necessary. Avoid use of detergents, as these may remove the finish on the hardware over time. Do not remove patinated finishes on hardware unless this patina is causing damage to the material the hardware is attached to or is prohibiting use of the hardware.
- Lubricate door hinges and window tracks as necessary to promote continued operability.
- Adjust or replace weatherstripping as necessary. Avoid adding excess weatherstripping to fill gaps or prevent air infiltration, as this may create further misalignment within openings.
- Ensure wall unit air conditioners are draining properly. Remove wall unit air conditioners when not in seasonal use.

Foundation and Grade

The foundation and the ground immediately around the foundation, referred to here as grade, serve important structural functions to the building. It is important to maintain good drainage around the building and to prevent moisture from entering through the foundation walls, and thereby into the building itself. Inspection of the foundation and associated grade may be conducted at the same time as the roof and downspout inspections, to ensure adequate drainage around the site.

Inspection

The foundation walls and grade should be inspected for the following issues:

- Standing water after weather events, pooling near the foundation of the building, depressions in the ground that reflect areas where standing water occurs after rainfall
- Material deterioration near grade on the foundation walls, including deterioration of elastomeric coatings, organic growth, spalling or cracking of masonry, or settlement cracks in the lower section of the wall
- Vegetation and plantings near the foundation walls, including trees and shrubs
- Evidence of organic growth from damp conditions or nearby downspouts
- Damage to seal between asphalt driveway and masonry foundation walls
- Driveway conditions, such as cracked asphalt
- Clogged driveway drainage

Maintenance

- Remove leaves and other organic debris from around the foundation of the building in order to prevent moisture from being trapped against the walls
- Manage vegetation around foundation walls to allow wall surfaces to dry after weather events.
- Maintain the grade around the building, ensuring it slopes away from the building to provide adequate stormwater management.
- Add drainage extensions as needed to facilitate adequate drainage
- Avoid use of de-icing salts, as these may cause damage to masonry that is close to grade
- Reseal seam between driveway and foundation as needed, or when driveway is resurfaced
- Avoid use of metal snow removal tools, such as metal shovels and snow blowers on walks and near building foundation, as this can cause damage to either surface

Interior

Interior maintenance is often more commonly referred to as “housekeeping”, and has become far easier due to modern cleaning methods than it was historically. Even at the time that the Rothner residence was built, vacuum cleaners had existed for nearly fifty years, and were a common household item. The interior section details more specific methods of cleaning which may be done less frequently than common household tasks such as dusting and vacuuming, although these two tasks are the primary form of interior maintenance. As with the exterior section, the interior section works from the walls and ceilings down to the floors.

Walls and Ceilings

Inspection

Walls and ceilings should be inspected for the following issues:

- Cracks or staining that appears to be active.
    - This investigation should consist of two phases: documentation and interpretation. A good rule of thumb is to gather as much information as possible to help identify the cause of the crack. Measure crack location and pattern (horizontal, vertical, diagonal, etc.) Dimensions (length, width, and depth) should be recorded using photographs and sketches. Although difficult in most cases, an attempt should be made to estimate the age of a crack. Mark the date that the crack appeared to the best of your knowledge.
- Evidence of condensation, mold, and mildew
- Nail or screw pop-outs
- Check tile grout on tiled surfaces for evidence of missing grout
- Check sealant gaps, such as those between walls and fixtures, for imperfect seals or deteriorated sealant or caulk

Maintenance

- Use a vacuum with duster attachment to remove dust and cobwebs from ceilings, corners, and wall surfaces before performing any other cleaning on these surfaces.
- Remove any smudges or obvious marks from walls using a clean, damp sponge.

- Wash walls using mild detergent and clean, damp sponges. Clean walls beginning from the bottom and working upwards, to prevent streaks and drips from running down the wall. Dry wall surfaces with a clean, dry cloth to prevent streaks.
- After dusting, wiping down, and drying wooden paneling, polish with mineral oil or other polish NOTE: spot test all polishes first to determine how they will react with coatings on the paneling

Floors

Floors receive the most abuse of any surface in a building, so cleaning and maintaining them regularly is the only way to slow the deterioration of floor surfaces.

Inspection

- Inspect floors for cracks and damage, as this may be a sign of buckling, delaminated adhesives, or other damage.
- Look for uneven tiles and floor surface
- Listen for noises when moving across floor surfaces
- Inspect floors for pet damage, moisture, and surfaces which may be peeling up

Maintenance

- Mop floors with a gentle detergent diluted in water, followed by a dry mop
- Re-adhere any flooring surfaces which may have delaminated with an acceptable adhesive NOTE: spot test all adhesives first to determine how they will react with flooring materials

Cabinetry and Kitchen Features

The kitchen is perhaps the most used utility space in the house, which means it puts up with a lot of wear and tear. Regular maintenance can help to preserve the historic character of the original cabinetry and kitchen features that still remain in the house.

Inspection

- Inspect all appliances for functionality
- Inspect cabinetry and drawers for functionality
- Inspect cabinetry finish for signs of deterioration and corrosion

Maintenance

- Lubricate tracks as necessary in order to facilitate ease of operation and prevent deterioration of hardware
- Regularly clean all surfaces in the kitchen with a mild detergent to eliminate buildup from daily kitchen use and to maintain finishes

Plumbing and Systems

The plumbing and systems located in a house of this age has likely seen its fair share of clogs and deterioration, so maintenance is paramount for this aspect of the house. These systems should be professionally inspected on a yearly basis, or more frequently when problems arise. Boilers should be professionally maintained, and the safety valves and thermostat should be checked for functionality.

Homeowner inspection for radiators should include inspection for leaks or damage, which should be repaired professionally.

Electrical systems should be inspected for the following issues:

- Abrasion to insulation
- Cracked or damaged wiring
- Fire hazards such as curtains or other fabrics near outlets
- Inspection of electrical systems should also include inspection of outlets, electric panels, switches

Homeowner maintenance should include cleaning of the interior and exterior of light fixtures.

Resources

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Feature	Material	Inspection Frequency	Season	Inspection Notes	Location of Issue	Maintenance Performed	Date	Cost	Notes
Roof	Rubber	Annually	Spring or Fall						
Chimney	Masonry	Annually	Fall, prior to heating season						
Flashing	Metal	Annually	Spring or Fall						
Roof Drainage	Aluminum Gutters & Leaders	Monthly, after major weather events	Before and After rainy season/ During or after weather event						
Exterior Walls	CMU with parging and elastomeric coating	Annually	Spring						
Foundation	CMU with parging and elastomeric coating	Annually	Spring, after freeze/thaw cycle						
Grade	Asphalt driveway, stone and concrete patios, earth	Annually	Spring, after freeze/thaw cycle						

Windows	Aluminum, Glass	Annually	Spring						
Doors	Wood, Metal	Annually	Spring						

Feature	Material	Inspection Frequency	Inspection Notes	Location of Issue	Maintenance Performed	Date	Cost	Notes
Walls & Ceilings	CMU, Drywall with latex paint finish	Monthly						
Floors	Slate, Tile	Annually						
Cabinetry & Kitchen Features	Metal	Monthly						
Plumbing	Varies	Monthly						
HVAC	Varies	Annually						

Rothner Residence

Additions Management Plan

Jefferson University College of Architecture and the Built Environment
MHP-603: Restoration and Rehabilitation of Modern Structures
Alan Davidson
Spring 2020

Introduction

The purpose of this plan is to lay out a comprehensive guide for future owners of the Rothner Residence to reference to make the most educated decisions in the event that an addition to the house is being considered. This is not an absolute set of restrictions and respects the reality that the owner will ultimately be the decider of changes. It is instead meant to be a tool to help reduce the overall amount of significance loss that the residence holds as a mid-century modern home.

Philosophy / Methodology

The relevant area of focus, which the significance is based upon with this plan is the connection the Rothner Residence has to the greater movement of the mid-century modern style and philosophy. In this regard, there needs to be an understanding of the main principles that guided the mid-century modern movement and its experimentation. This understanding allows the residence to be comparatively analyzed against an index of these principles. From that the identification of a hierarchy of significance within the residence's own design principles can be made. Decisions of potential additions to the house in the will use this model as the framework for what is allowable in not hindering the significance of the house. The main philosophy that this plan references for its idea of significance is the "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings" and its ideology for rehabilitation.[1]

Historic Context

The main source of focus to the understanding of the mid-century movement is the Case Study House Program that ran from 1945 - 1964; placing the Rothner Residence right within the period in 1949. The case study house publication included and documented a variety of the most famous mid-century modern buildings. The main purpose of this program was to encourage architects to use new abundant post war building materials as well as address architectural

[1] Woodcock, David G., Kay D. Weeks, and Anne E. Grimmer. "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings."

understanding of the post war cultural shift in the modern family.

As well, Richard Neutra was one of the main contributors to the publication and with his Hassrick House also located on West Schoolhouse places a focus on the street as a whole for the presence of strong mid-century modern experimentation. This gives the Rothner Residence, and the entirety of the mid-century modern scene in East Falls, a huge significance as they were the north eastern United States regional experimentation

The architect Norman Rice was also around prominent early modernist architects and mid-century modern architects. Rice had gone to Europe and while he was there he worked under Le Corbusier. Le Corbusier was the architect who designed La Ville Savoye which was known for its integration of the car which was a huge leap to bridge the modern machine into the home. It was also known for its strong connection to the exterior with strong moments of large glazing. Besides with its function it introduced new building materials too.[2]

Rice also worked with Louis Kahn, another modernist architect who designed the Salk Institute. While he was more guaged towards brutalism in his materiality, he did embody some important modernist principles, such as the interior exterior connection and the needs of the modern person.

Mid Century Modern Movement

The mid century modern movement included some of the most famous architects of the middle of the century such as Pierre Koenig, Richard Neutra, Charles Eames, David Thorne, Eero Saarinen etc. They all followed the back end of the modernist movement and attempted to universalize and push what could be done for the modern family with modern materiality. It was primarily practiced in California and the movement was not very concerned with sustainability or how the building functioned in the climate. The philosophy was centered around experimentation for the future. Because of this noble period we have evolved even further in architecture and therefore these mid-century modern buildings deserve to be maintained in the idea that they stand as an important lineage of architectural history.

Even more important is that there were notable efforts to bring the style northeast where there is a dramatically different climate and to see how that experimentation was done. It is

[2] The Villa Savoye: A Manifesto for Modernity. Accessed March 25, 2020.

probably even more successful to see how modern principles could be brought into an even more universal context.

Rothner Residence in Comparison

The Rothner Residence shares many characteristics of many of the more famous mid-century buildings as would be expected. A look at the Eames house would point out the similar use of color on the exterior walls as well as its rectilinear form. Looking at the Stahl House we can see a similar aspect of the axial circulation paths as well as a strong private front facade and a strong visual connection to the rear outdoors. It also shares in the use of the butterfly roof with large soffit.

Design Hierarchy

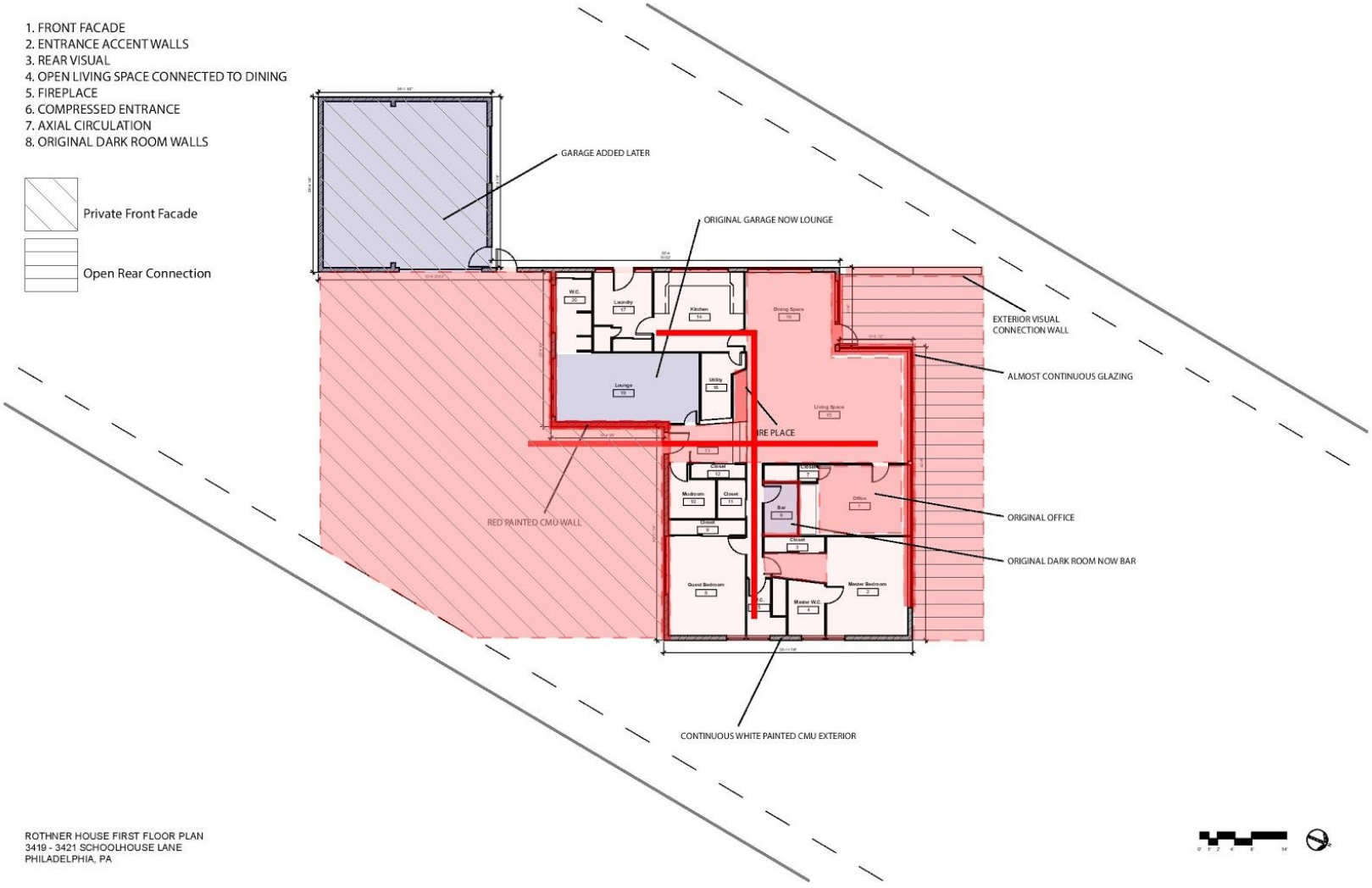
1. **Front Facade**: This is the largest area of concern and is one of the largest core values principles of mid-century modern homes being the privacy of the front facade.
2. **Rear Visual**: Connection between the indoors and outdoors was meant to connect the residents to nature.
3. **Butterfly Roof**: This was a new roof type of the period and is a stark contrast from the gable roofs of the majority of East Falls.
4. **Original Exterior Walls**: The integrity of the original footprint should be unaltered as much as possible to keep the original rectilinear form integrated.
5. **Cupples Windows**: Modular new style windows of the period and fits with the motif of new post war building materials, however some are not original (on the garage, and where the garage used to be).
6. **Glass Block**: New modular glass unit of the period, (garage blocks not original)
7. **Central Axial Plan**: Important plan organizational motif and keeps with the simple organized circulation.
8. **Living Space**: Culturally significant shift to large open central living space and in this case is attached to the kitchen, which broke down the cultural norm of having a separate dining room.
9. **Original Office**: Cultural shift to workspaces at home
10. **Compressed to Open Thresholds**: Important circulation control motif, it gave the house an openness to manipulate spatial awareness of a smaller home.
11. **Rear Partition Wall**: Reinforces the indoor outdoor connection motif
12. **Centrally Located Fireplace**: Centerpiece of the house and living space
13. **Original Dark Room Walls**: Original space of Dr. Jacoby's Dark Room (non original room use, now bar)

Plan Assessment

1. FRONT FACADE
2. ENTRANCE ACCENT WALLS
3. REAR VISUAL
4. OPEN LIVING SPACE CONNECTED TO DINING
5. FIREPLACE
6. COMPRESSED ENTRANCE
7. AXIAL CIRCULATION
8. ORIGINAL DARK ROOM WALLS

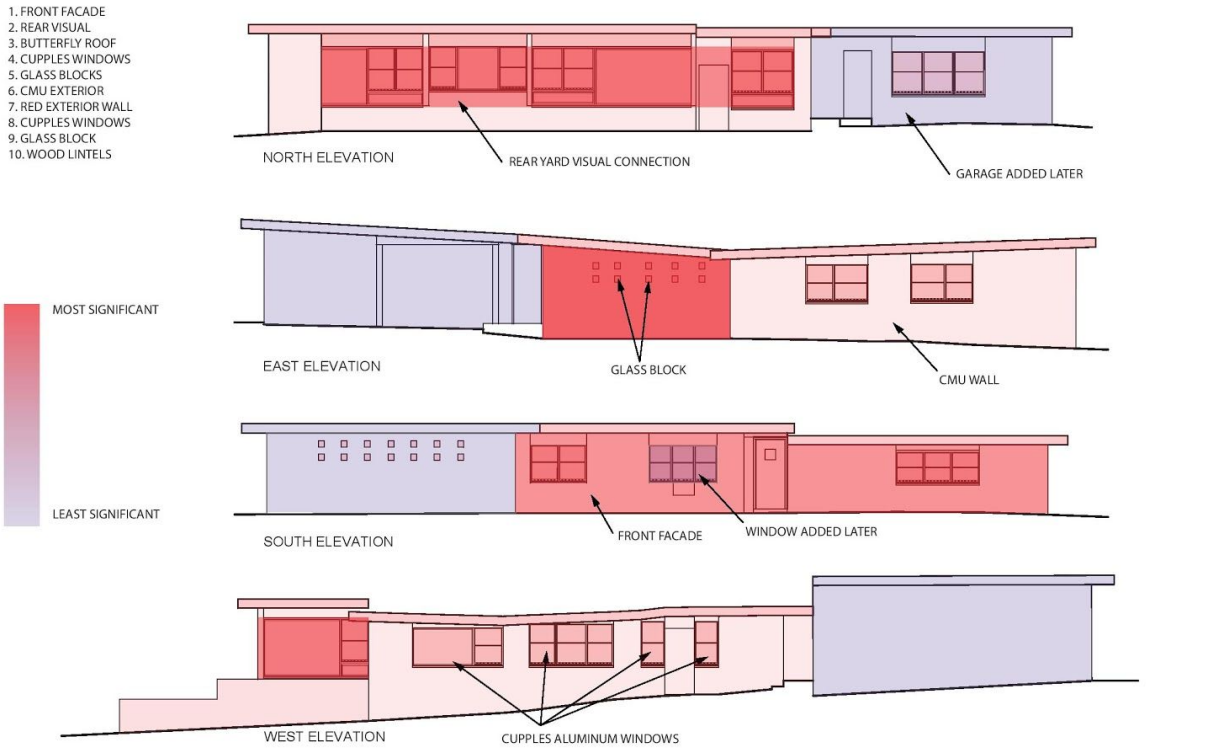
Private Front Facade

Open Rear Connection



ROTHNER HOUSE FIRST FLOOR PLAN
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA

Elevational Assessment



ROTHNER HOUSE EXTERIOR ELEVATIONS
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA

Compatibility

Colors should not visually interrupt the original building and should fit with the original, successful colors are white, black, grey, and appropriate amounts of red.Materials should maintain design intent language but not replicate, and a successful usage of local building materials/styles is acceptable to blend with the area without hurting the original look. Glazing should maintain privacy, and outdoor connection intent, this calls for the use of large rear facing casement windows.

Recommendations

- Any area indicated within the diagrams should be identified for its level of significance associated with it.
    - The redder the area the more cautious changes should be to minimize loss of significance.
    - Bluer areas are areas that can be changed with no impact to the original integrity of the building.
- Changes should follow the significant abstract design principles of the original residence
    - Privacy from the street
    - Visual connection to backyard
    - Axially, central plan
    - Compressed to open transitions
    - Open living spaces
- Additions should be done in the most compatible way
    - Usage of uniterupting colors; black, white, grey, off-white, accent colors of blue or red
    - Does not attempt to replicate or copy original style of the rothner residence
    - Use either a contemporary style, or that of the local East Falls area for appropriate additions
    - Does not overpower the original residence visually

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Rothner Residence

Addition Options

Spencer Rubino

Spring 2020

Introduction

Additions in terms of historic buildings has always been a point of contention within the preservation community due to sensitive the additions must be to the initial structure, as stated in 14 Preservation Briefs, New Exterior Additions to Historic Buildings: Preservation Concerns by Anne Grimmer and Kay Weeks,

> It [additions] is often discussed and it is the subject of concern, consternation, considerable disagreement and confusion. Can, in certain instances, a historic building be enlarged for a new use without destroying its historic character? And, just what is significant about each particular historic building that should be preserved? Finally, what kind of new construction is appropriate to the historic building?[1]

The idea of putting an addition on a structure that has its value in its independence may be considered by some to be detrimental to the character of the historic building and is fully addressed in many different historic preservation documents. In the Venice Charter, Article 13 it states, “Additions cannot be allowed except in so far as they do not detract from the interesting parts of the building, its tradition setting, the balance of its composition and its relation to its surroundings.”[2] In this case, additions are acceptable as long as they do not interfere with the original intent of composition and design.

The Burra Charter also states in Article 22.1 that, “New work such as additions or other changes to the place may be acceptable where it respects and does not distort or obscure the

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[1] Anne E Grimmer, “14 Preservation Briefs, New Exterior Additions to Historic Buildings: Preservation Concerns,” National Park Service (U.S. Department of the Interior, August 2010), https://www.nps.gov/tps/how-to-preserve/preservedocs/preservation-briefs/14Preserve-Brief-Additions.pdf)

[2] “International Charter For The Conservation And Restoration Of Monuments And Sites (The Venice Charter 1964) ,” International Charter For The Conservation And Restoration Of Monuments And Sites (The Venice Charter 1964) § (1964), pp. 0-4)

cultural significance of the place, or detract from its interpretation and appreciation."[3] In this case, it is not only the intent, but its cultural significance or individual interpretation an appreciation which is more in-depth in terms of its allowance of additions.

The Secretary of the Interior's Standards for the Treatment of Historic Properties also outlines the careful consideration required to put an addition on a historic building,

A new addition must preserve the building's historic character, form, significant materials, and features. It must be compatible with the massing, size, scale, and design of the historic building, while differentiated from the historic building. It should also be designed and constructed so that the essential form and integrity of the historic building would remain if the addition were to be removed in the future.[4]

This document goes into greater detail into how the addition is required to look. The specificity listed in this document shows how pivotal it is to make the addition not only compliment the original building but be clearly recognizable as separate as to not obscure what is original and what is an addition.

The Rothner residence is a fickle building, as it is site specific and also complex in terms of finding an appropriate location for an addition. The locations that would best suit an addition would be the west elevation between the garage and main building, and the northern-most elevation. It would be important to note the importance in developing a plan for a future occupant of how they would approach an new addition, especially because in Pennsylvania for any

[3] The Burra Charter, The Burra Charter § (2013)

[4] Anne E Grimmer, "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings ," The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings § (2017), p. 26)

additions on a historic site or level-2 alterations are subject to a building permit.[5] The addition would have to compliment the residence without becoming too similar to it. The interior would have to resemble the concepts Norman Rice implemented but update the quality of life within. The scale of the addition must not detract from the house or must be clearly noticeable as an addition.

Schemes

Two schemes will be provided that compliment the Rothner Residence. They vary in terms of their size and concept but are both respectful to the original residence. The location designated for both of these additions is on the northern elevation next to the master and guest bedroom. Both additions are quality of life based, adding additional bedrooms and a new master suite for occupants who wish to welcome additional guests into the residence or improve their quality of life. The reason as to them being on the north end of the house is due to how Rice designed the residence and its compliment to the massing. Rice split the house into a public and private portions, so continuing his private wing made sense since the additions are private. The location is also the most fit to not detract from the historic significance of the house. As can be seen in the site plan, the addition still allows for complete circulation from the backyard to the front and gives enough room between the neighboring property.

Scheme 1

The first scheme is for the more conservative owner. There are two options, either an addition with twin guest bedrooms or a master suite. The addition is accessed through the

[5] "Treatment of Historic Buildings." Department of Labor & Industry. Commonwealth of Pennsylvania. Accessed March 21, 2020. https://www.dli.pa.gov/ucc/Pages/Historic-Buildings.aspx.

original guest bathroom which has been removed to create an entrance to a hallway running perpendicular to Rice's existing hallway. Rice's idea of compression and expansion is explored in the foyer to the living room, and again in the private hallway to the bedrooms. This concept is continued through a long thin hallway that leads to a larger space. Rice also explored the use of light as a guiding principle as shown in the procession for the foyer to the living room. This is also implemented with a full height vertical window at the end of the hallway to guide the occupant to the bedroom(s). The guest bathroom is replaced with one at the east end of the addition. The bedrooms are equal in size; however, the west bedroom has the advantage of a view to the backyard which was another concept Rice implemented in the residence. The addition itself is set back from the east elevation as to not intrude upon the main house massing. The addition also follows the same roof pitch as the northern end of the residence. The windows on the east elevation compliment that of the original front, however they are contemporary and less complex to create an idea of technological advancement. In the master suite option, this window is turned into glass brick to play off Rice's use of it on the north elevation near the front door. On the west elevation, a dichotomy is created between the large paned glass on the main residence and the addition. The addition implements the concepts of Frank Lloyd Wright, another mid-century modern architect who used full-length or half-length vertical windows to break the horizontality of the residence's mass. This helps to show the difference between the addition and residence. The mass of the addition is made of black machine brick, a muted color to not draw attention and machine brick was a common material used in modern construction.

Scheme 2

The second scheme is much more adventurous. It is for the owner who wishes to make their mark on the residence. The concept behind this addition is a focus on view. Again, we begin

with the original guest bedroom being removed to create an entrance to a smaller hallway. As one enters, to their left is a stairwell. To the right, the concept of light pulls one to a guest bedroom. As one enters this guest bedroom, the concept of compression and expansion is explored with a thin hallway that leads to a large bay of vertical windows on the west elevation taking cues as formerly noted from Frank Lloyd Wright. If one chooses to ascend the stairs, they are greeted with a door that leads into a large master suite that contains views of the east and west. This is the only location in the house where one can experience this. There is also light that comes from the south through a bay of windows The windows that face the east elevation are similar to those below it, and the window bay facing west again employs the verticality of those on the lower portion of the addition to create a similarity between the two. The master suite also has the benefit of a deck that is the roof of the guest bedroom which creates a unique experience that was not present on the original house. The addition is again set back from the house as to not detract from the original mass. The materiality is the same as formerly with black machine brick.

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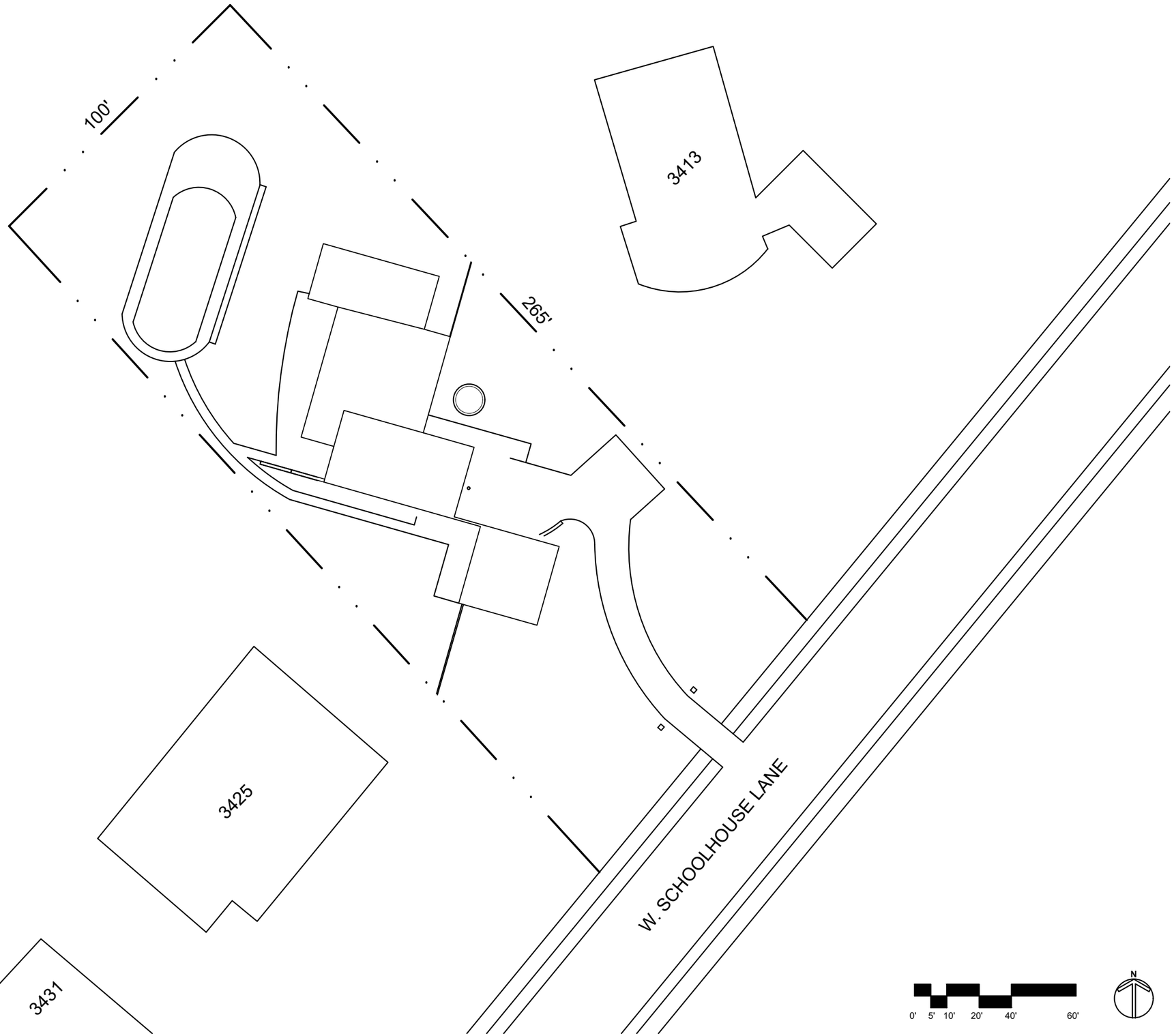
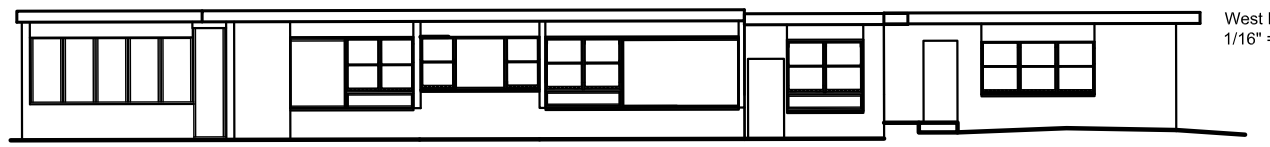
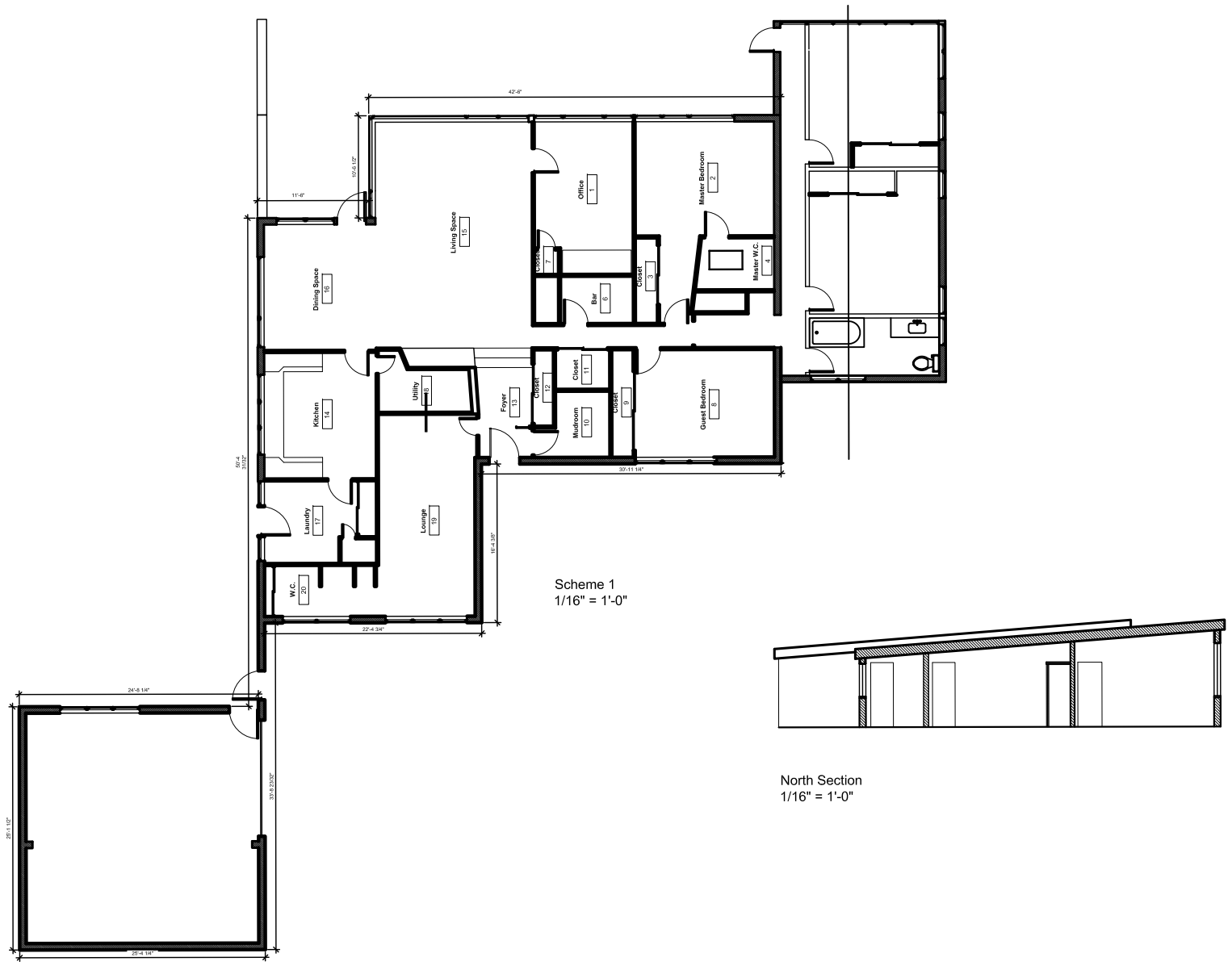


ROTHNER HOUSE SITE PLAN
3419 - 3421 SCHOOLHOUSE LANE
PHILADELPHIA, PA

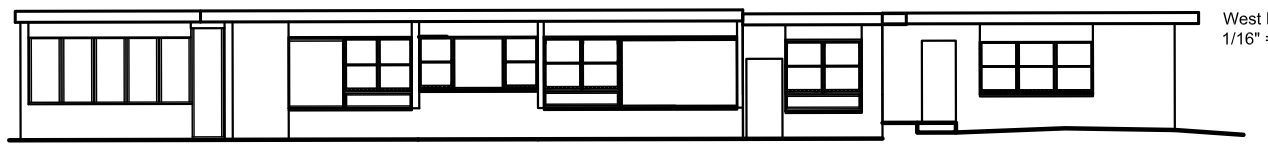


West Elevation
1/16" = 1'-0"



Scheme 1
1/16" = 1'-0"

North Section
1/16" = 1'-0"



West Elevation
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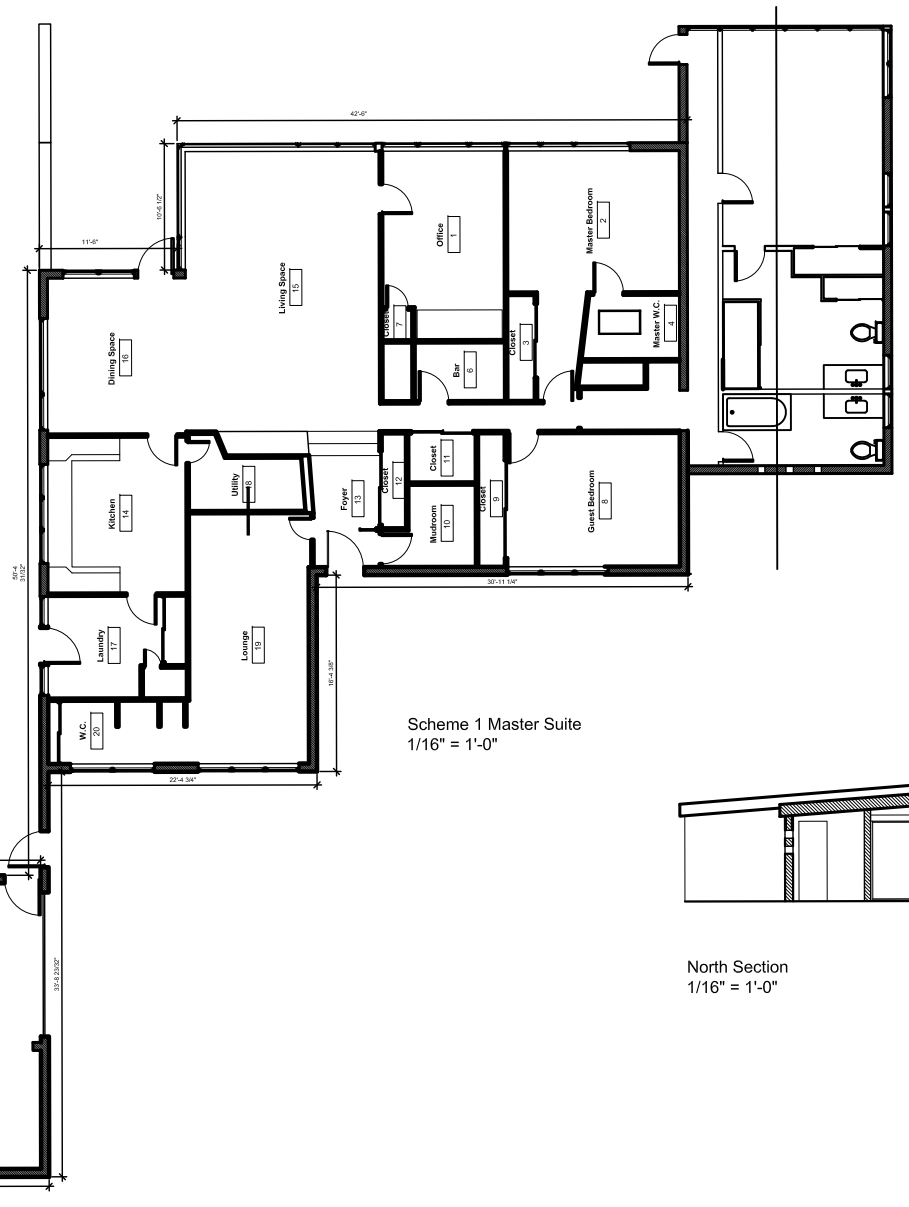

Scheme 1 Master Suite
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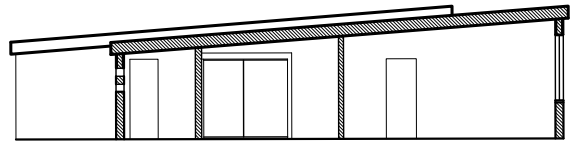

North Section
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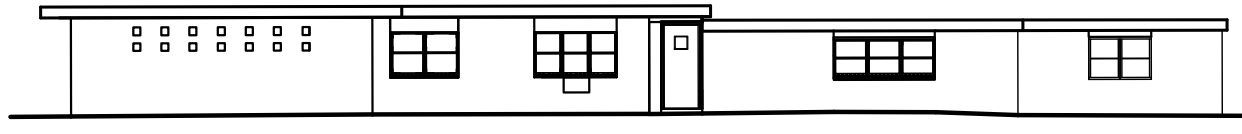

Front Elevation
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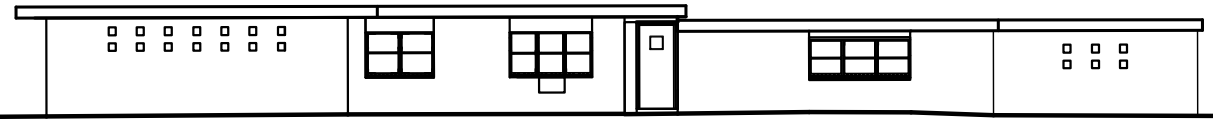

Front Elevation
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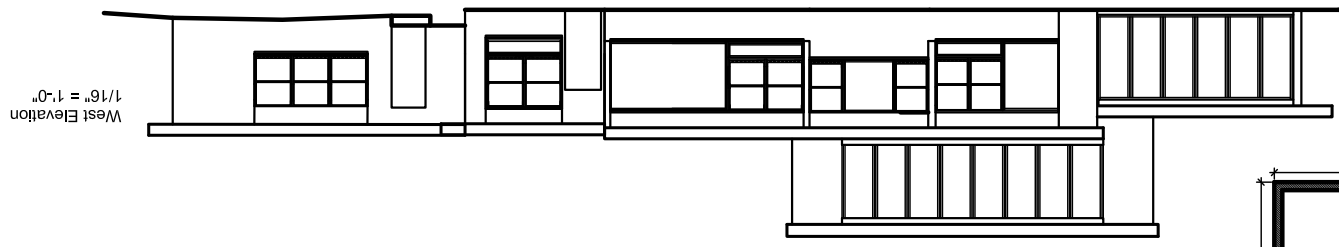

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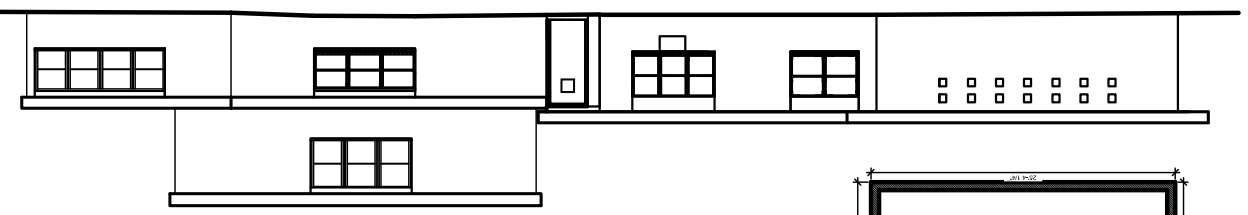

Front Elevation
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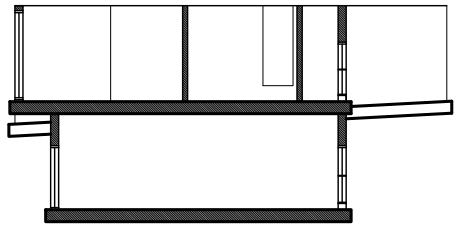

North Section
1/16" = 1'-0"