On proportional design and diagonal planning in R.M. Schindler’s Beach house of 1936/38 for Anna Olga Zacsek

Jin-Ho Park and Su-Jung Ji

Department of Architecture, Inha University, Incheon, Korea

ABSTRACT

Rudolph M. Schindler’s revolutionary theories and designs, which were clearly ahead of his time, have gradually been recognized for their ingenuity. His work would equip him to represent the American modern avant-garde. Many architects find it difficult to leave behind working conventions. Perhaps, only a few in the profession have challenged conventional thinking and working traditions, including Schindler. Among Schindler’s oeuvre, the beach house built for Anna Olga Zacsek is unique in terms of its systematic interplay of the diagonal axis and his unit grid design. Unfortunately, the building was demolished before becoming extensively known in the architectural community. Many scholars and commentators have briefly commented on the house, yet there has been no in-depth study. Thus, the surviving archival drawings were read and reconstructing, and a physical scale model was fabricated. These were used to uncover the house’s unique spatial characteristics and to expose the underlying logic of it spatial composition.

1. Introduction

Rudolph M. Schindler designed a beach house for Anna Olga Zacsek (1896–1973), which seemed to have stood until 1970 yet was demolished between 1970 and 1975. At the start of the 1970s, it was necessary to expand the perimeter of Los Angeles International Airport (LAX) due to the increasing demand for space. Between 1970 and 1975, the Los Angeles Department of Airports purchased large residential areas bordering LAX to create a buffer zone between the airport and its surroundings. This resulted in the removal of the west end of the airport runways, including part of the beach community of Vista del Mar where the beach house was located (Gebhard and Winter 2003).

At present, the site of the house is left empty as part of an “airport respect zone.” Most houses around the area were removed. (Figure 1) There remains only a layout of the streets that existed during that time (Tombesi 1995). The house was Anna Olga Zacsek’s first house at the age of 40. Perhaps, the demolition could have been a surprise to her since it was demolished a few years before she died. She might have watched poignantly as the house vanished without a trace, with a great deal of her memories fading away along with it.

Unfortunately, the building has never been subjected to any type of research or close scrutiny among scholars or the architectural community. This has been due to that the house has not been recognized as a major work in Rudolph Schindler’s oeuvre, and it has never been written about in depth. Worst of all, many of Schindler’s works have been deliberately reevaluated posthumously in recent years. Before receiving any architectural attention, the house was demolished. This study could perhaps be the first to investigate this house in any depth.

2. The client: Anna Olga Zacsek

Anna Olga Zacsek was a daughter of Hungarian immigrants who settled down in Los Angeles in 1902. She started her career as an actress under the stage name Olga Grey. Starting with “His Lesson” (1915), she acted in numerous films, including D.W. Griffith’s “The Birth of a Nation” and “Intolerance.” With the decline of her film roles and the film industry between 1920 and 1921, she became involved in the theater business. Olga Zacsek later ran a theater company after founding “The Actor’s Theater” in Hollywood. 

At the time, Schindler’s Kings Road house became a place to contact “a modernist circle of like-minded artists” in Los Angeles. Many artists and musicians became a part of the circle, including John Cage, Galka Scheyer, and many others (Marcus 2016; Nicholls 2002). Schindler with his wife Pauline had a close personal tie with each of the artists at the Kings Road House, including Zacsek. In 1928, Schindler had a chance to design a stage set for Fyodor Dostoyevsky’s play, “The Idiot,” due to Zacsek and her theater company.
Zacsek later left the business and entered law school to become an attorney. She passed the bar in 1932 and became a successful attorney after dealing with many significant lawsuits. Right after, she commissioned Schindler to design a new house at Playa del Rey in 1936. Zacsek also represented Schindler in his divorce hearing and business dealings. The house was completed after the Schindler’s divorce proceedings began in earnest in late 1937.

Later on, Zacsek purchased a 30-room hacienda-style house in Hancock Park, Los Angeles. The house was known as the Fudger House after the original owner, Eva K.J. Fudger. Still in contact with Schindler at that time, she tasked him with some alteration works on both the beach house and the Fudger house.2

3. Initial scheme

The beach house has chiefly been known from a few photographs and Schindler’s own drawings in the architectural drawing archives at the University of California, Santa Barbara. The archive has 24 extant drawings, including schematic sketch plans, perspective sketches, floor plans, elevations, sections, and detail drawings.3 According to the drawings, Schindler designed the initial scheme of the house in 1936. The initial scheme was a simple one-bedroom house, including a bedroom with a closet and bath, kitchen, and living room. The layout is L-shaped with a patio in front. (Figure 2) The floor plan is based on his 4-foot unit grid, and the section and elevation are regulated by a 16” vertical module. A car park could have been located outside the house but was not included in the floor plan. This plan is a more or less an L-shaped beach cabin. The construction materials seem simple. Reinforced concrete slab is used for the floor throughout, and the structure is made of 2 x 4 studs with an interior covered in drywall. The exterior was sheathed by plywood panels painted for weather, with sloping walls also sheathed with plywood panels.

Based on the initial scheme, the final design was developed between 1937 and 1938 after Zacsek became involved for some changes.4 In the final design, the house is nestled on sand dunes and directly orientated towards ocean views to the west. The garage is tucked into the ground level, and the main house is placed over the garage. A terrace is located on top of the garage and opens to the porch. (Figure 3) The space program is similar to the earlier scheme except that a pantry and dressing room were added. After the house was built, there were continuous additions and minor alterations to the house until 1951, such as a room addition with a bathroom, a patio and landscape alteration, a wind breaker addition, and barbecue grill furniture detail (Park 2015).

The main structural material for the house is brick, which mostly form the walls. Some parts of the enclosure such as the pantry and terrace are covered by wood boards. The bricks are layered horizontally, but the wood boards are vertically aligned. The wooden gable roof is supported by brick columns. This use of brick as the main structural material is rare among Schindler’s designs. (Figure 4)

The composite roof covers the house with a moderate slope, with 2 x 6 rafters nailed to the ridge board along the peak of the roof and sloping downwards. The rafters are spaced 2 feet apart. A flat-roofed dormer window facing the north direction is

---

2It was originally designed for Eva K.J. Fudger by architect Roland E. Coate, Sr. in 1925–26. Howard Hughes rented the house first and then purchased it later from Fudger for a reported $135,000. Howard Hughes lived in the house until 1942, and then the ownership moved to Zacsek. It is located at 211 Muirfield Road, in Hancock Park, Los Angeles, CA (Vaught 2016).

3All drawings are well preserved at the Schindler Archive in the Architecture and Design Collection, University of California, Santa Barbara, CA; and also see Garland 3884–3907 (Gebhard 1993).

4According to their correspondence, Anna Olga Zacsek seemed to be involved in the design of the house. In a letter sent to Schindler, Zacsek wrote, “Please wait on my plans for the house until I can come over with my photographs so that you may see what sort of things I desire” (Mitchell 2011).
installed on the roof, which offers benefits of increased headroom with much needed light and ventilation. (Figure 5)

4. Unit plan and proportional design

Schindler used a modular unit system called Reference Frames in Space as his design method. With this method, he believes that all specific locations and sizes of the building parts with respect to the whole building are precisely measured and identified during the design and construction process. The system involved no arbitrary unrelated measurements. When designing a building, the system also provides a means for architects to mentally visualize “space forms” in three dimensions. It is a sort of heuristic method of
spatial learning, exploration, and even discovery. Schindler argues that it is one of the most important tools for the "space architect," stating that the tool must be a unit that one can carry palpably one's mind to deal with space forms easily but accurately in the imagination (Schindler 1946).

Schindler recommends 48 inches (4 feet) as a basic unit to be used with simple multiples and with half, third, and quarter subdivisions. This makes it possible to derive all necessary dimensions for building parts needed in architecture, such as doors, windows, furniture, and so on. All dimensions can thus be played with freely in the designer's mind with accuracy using no mechanical measuring devices. Thus, space forms are successively conceived from the mental play with the unit system.

Schindler consistently used the unit system from early in his career to the end, with few exceptions. His early designs rely on rigorous use of the unit system, which is

---

5 In 1916, his lecture notes already indicated that Schindler was concerned with a simple unit with its subdivision: "Architect to choose his own 'Unit', unit to be subdivided ½, ¼." In this period, he was also interested in squares as well as rectangles, triangles, and circles due to the “different expression of buildings.” But in practice, he never used any other geometric forms other than squares as a unit figure.

6 Lionel March substantially interpreted Schindler's unit system with regard to the Classical theory of proportions and, also compared Schindler's system to Le Corbusier's system of the Modulor (March and Sheine 1994). Interestingly enough, Melendo et al. (2014) partly interpreted a potential yet indirect link between Schindler's unit system and the system used in traditional Japanese architecture. Even so, the development of Schindler's unit system was well delineated with the archival materials in Park (1999, 2003).

7 It includes the Translucent house (1928, 37-inch vertical module) and Schindler Shelter (1933/42, 5 foot by 5 foot). In addition, although Schindler used a 2-foot and 8-inches by 2-foot and 8-inch module in his Bethlehem Baptist Church of 1944, it is simply 2/3 module of 48 inches.
clearly marked on drawings and on the house. He marks
the unit system on the drawing in the form of grids.
Numbers and letters are laid out on the 4-foot grids in
order, and: the vertical module is identified with the
grade. With this system, every location in the building is
identified with exactitude, and it ensures that all neces-
sary size information appears on the drawings (Park 2006).

However, Schindler’s later works often appear to
deny any consistent use of the system in the building.
At times, his unit system is neither marked on the
drawings nor identified on the house. The beach
house for Zacsek is one such case. At a glance, the
floor plan design seems to have nothing to do with the
use of the system.

The house was designed in Schindler’s heyday
when it comes to his notion of “space architecture”
(Schindler 1934). In addition, Schindler was in com-
mand of his unit system at that time. It is believed
that fluid mental command of the unit system appears
to be paramount in the architect’s conscious in daily
practice because it is important to visualize and iden-
tify spatial portrayals that do not appear to be the ful-
lledged spatial forms in mind on the surface. He must
master the method in mind under the notion of space
architecture and freely apply for the power of imagina-
tion and visualization of space forms. His most com-
plex spatial forms were mostly accomplished in the
1930s, such as the Buck House of 1934, the McAlmon
House of 1935, and the Mackey Apartment of 1939,
where the space forms are intertwined in three dimen-
sions. Although the unit system does not appear on
the house or even on drawings in his later projects, it is
inherent in the design.

Schindler recorded the dimensions of individual
rooms on his working drawings of the house with
a rectangular form. He marked only the width and
length of major rooms with simple whole numbers.
The dimensions of irregularly shaped rooms at times
overlapped or zigzagged, and they were even approxi-
imated by adopting whole numbers and labeling
dimensions “a x b” on the drawings. At times, he over-
looked dimensions of minor or insignificant spaces. It is
possible that he assumed that simple whole numbers
would make it easier to visualize the space form in the
context of his unit system.

In the house for Zacsek, Schindler’s approximation of
room sizes includes a 20 × 16 (5:4) living room, a 9 × 8 (9:8)
kitchen, a 12 × 10 (6:5) bedroom, and an 8 × 7 (8:7) bath.
(Figure 6) While some rooms have irregular shapes,
Schindler approximates the sizes of each room and con-
verts them to simple whole numbers so that he can
manipulate and closely assess the sizes of each room in
his mind.

The proportional design of the rooms is interesting.
Once all dimensions of rooms in the house are
reduced, they turn out to be a sequence of ratios,
such as 5:4, 6:5, 8:7, and 9:8. It is hardly believed that
these simple ratios guided Schindler to generate the
spatial design, but such simplicity in the size relations
must have been in his subconscious mind. Its simplicity
is not the main issue, but instead, it illustrates that his
unit method is sufficient to measure the size of the
building and to visualize the interior space, which
makes the act of creation so powerful. In most of
Schindler’s practice, such simplicity is hidden under
what appear to be complex space forms.

In addition, these simple ratios illustrate Schindler’s
earlier concerns for “rhythmic dimensioning” in archi-
tecture. Schindler was interested in rectangular dimen-
sions arranged in “rows” (Park 2003; March 2003). This
was illustrated in the Church School lecture note,8
which is a sequence or “a following of unequal units
with definite changes.” The notion is simply described
as a set of nested squares, representing row-0, row-1,

Figure 6. The first floor plan of the beach house with room dimensions.

8Schindler himself documented a series of lectures at the Church school in Chicago in a booklet of his handwritten notes. The lecture notes are housed in
the Schindler Archive at UCSB (Park 2003).
row-2 \ldots$ Basically, if $a/b$ is a term in the “row,” the next term is $(a + 1)/(b + 1)$. Row-0 is represented by squares $1/1$, $2/2$, $3/3 \ldots$ with terms like $a/a$. Then, row-1 is represented by rectangles $1/2$, $2/3$, $3/4$, $4/5$, $5/6 \ldots$. Row-2 is then represented by rectangles $1/3$, $2/4$, $3/5$, $4/6 \ldots$ as expressed in Figure 7. Each row produces a sequence of a shape family of a certain proportion. Interestingly enough, the proportional ratios of the rooms in the beach house for Zacsek including 5:4, 6:5, 8:7, and 9:8 lie within the category of row-1 (Park 2003).

5. Diagonal planning

The most interesting compositional characteristic of the house is its butterfly plan layout set along the diagonal axis (Park 1996, 2000, 2004; Sheine 2001). The single story house is flanked by two splayed wings. The plan maximizes the ocean views and gives the best orientation to all rooms. The house is positioned to hug the front patio and garden. The northern wing serves as the entrance to the main floor and the car garage with a terrace on top. Daylight is provided to the garage through clerestory windows.

The southern wing contained the bedroom and dressing room for Zacsek. The living room, kitchen, and dining room are located in the center. These rooms are extensively with fenestration to the south, offering an uninterrupted front view and allowing a maximum expression of openness to the ocean views. These rooms also have “a pair of snug horizontal dormers” in the hipped roof to receive natural sunlight from the east (Gebhard 1980). The triangular scheme extends to the gabled profiles of the roof, which is supported with square brick columns. The trellis on the roof extends the house visually into the backyard. The fireplace and pantry are set along the diagonal axis. Schindler left a sketch around the fireplace that retains a built-in couch with a three-sided open fireplace overlooking the patio. A door at the kitchen provides access to the backyard.

When keenly analyzed, it turns out that the juxtaposition of the plan is based on the triangular geometry as an underlying principle along a major axis. Unlike other butterfly layouts found in the history of architecture, Schindler’s design is not set on a 45-degree axis but on a 60-degree angle. (Figure 8)

We can make assumptions about how Schindler laid out the overall plan. Perhaps, a central axis toward the ocean view was laid out first. Then, an equilateral triangle could be placed along the axis for the overall shape of the design. Another equilateral triangle could be inscribed in an equilateral triangle by joining the midpoints of the sides of the larger triangle. Then, four equal triangles would be formed. This triangular geometry becomes a governing platform of the spatial composition of the rooms and details on the plan. (Figure 9)

At a glance, some might argue that the plan is shaped arbitrarily or just in a butterfly pattern. A close look demonstrates that the equilateral triangle along the diagonal axis determines each of the spaces and overall organization of the house. The final design looks a butterfly layout where two wings are placed along the central axis. The beach house is an archetypical example of using the strong diagonal axis inscribed in an equilateral triangle, similar to the earlier Packard house of 1924 (Park and Park 2013).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Figure7.png}
\caption{Diagrams that illustrate a sequence of proportion of row-1 (left), row-2 (middle), and row-3 (right).}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Figure8.png}
\caption{Typical butterfly layout (left) and butterfly layout for the beach house (right).}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Figure9.png}
\caption{Diagrams that illustrate a sequence of proportion of row-1 (left), row-2 (middle), and row-3 (right).}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Figure10.png}
\caption{Typical butterfly layout (left) and butterfly layout for the beach house (right).}
\end{figure}

\footnote{Per its triangular composition, Gebhard (1980) writes that Schindler’s shift from the rectangular volumes into turning parts of them at seemingly odd or arbitrary.}
It seems that Schindler’s decision is based on a rational approach to his design. It accommodates the direction of ocean views, the shape of the site, the natural setting of the contours, and perhaps the client’s request. The design source of the triangular theme derives from his 1924 Packard house, where the triangular geometry governs the underlying organization of the entire house design. In the Packard House, the overall plan and elevation were set on an equilateral triangle. The triangular organization of the space form was an important theme in Schindler’s work, forming a controlled interplay between geometry and the unit module. (Figure 10)

The “butterfly” theme is dominant in Schindler’s later projects with these particular angles. The list includes residences for Elizabeth van Patten in 1934/35. The use of 45 and 90-degree angles with a butterfly layout is extremely strong in the Southall House of 1938. The Rodriguez House of 1940–42, the Druckman House of 1940–42, and Bethlehem Baptist Church of 1944 have L-shaped 90-degree orthogonal dispositions. In particular, the whole structure of the Church is diagonally planned, including seating areas, the choir, tower, ceiling, etc. The Gold House of 1940/41 and 1945/46, the Daugherty House of 1945/46, and the Roth House of 1945 involve 45-degree angles. Later on, these angles were less regular in the butterfly scheme for the Lechner house of 1946, the Toole House of 1946, and the Kallis House of 1946.

With regard to Schindler’s use of the butterfly layout, it is worth investigating historical precedents as possible sources of Schindler’s interest. Schindler would have been well accustomed to the orthogonal bilateral symmetry from the Wagner ‘scheule and the pervasive influence of the Beaux-Arts tradition (Park 2003; March 2003). In principle, the butterfly pattern is an example of reflection symmetry. Schindler’s earliest use of the symmetry can be traced back to his 1920 competition project, the Free Public Library (Park 1996). Throughout history, diagonal axial symmetry has been used in ornamental design but less in architectural composition. The use of diagonal symmetry for architectural composition is largely a modern development.

One of the most striking early uses of the butterfly layout in residential design is the house in Westwood Park, Worcestershire (1612–20). It was not originally planned as a butterfly layout, but while adding new wings, it assumed this shape. The unusual butterfly plan reappears in 1891 in a house called The Chesters, for which Richard Norman Shaw received a commission to add parts to an existing building originally built in 1771. The layout found its best expression in the hands of the Arts and Crafts movement. Edward Prior designed a series of houses based on the butterfly pattern. He designed a barn in 1896 and then another house in Voewood,

Figure 9. The floor plan inscribed in the triangular geometry.

Figure 10. Plot plan (left) and first floor plan (right) of the Packard House. The first floor plan clearly illustrates the triangular geometry, and the unit grid system is overlaid.

10Such an attitude is clear to Schindler’s How house of 1925, which is placed on a diagonal axis by setting the orthogonal lines of the ground plan at a 45° angle of the lot shape (Park 2000).
Norfolk in 1902–05, which was fully developed into the butterfly pattern.\textsuperscript{11} C.F.A. Voyage’s house at Annesley Lodge in London (1895) also clearly presents an L-shape that is arranged diagonally. (Figure 11)

In 1901, Baillie Scott (1906) designed the Dulce Dimum house, and he himself acknowledged that his design was very much influenced by Prior’s. The Arts and Crafts movement was influential in German speaking areas, including Vienna, where Schindler studied architecture at the Technische Hochschule and Wagnerschule). Hermann Muthesius showed the use of the diagonal axis in his book, Das Englishe Haus. Kornwol points out that Muthesius applied the approach to his own designs at the Freudenberg House.\textsuperscript{12} Schindler’s mentor, Adolf Loos, “thanked Muthesius in print for Das Englishe Haus” (Banham 1980).

Frank Lloyd Wright, whose influence on Schindler’s early architectural development was significant, used the “butterfly” theme early in his career. In the unbuilt Henry Cooper House of 1887,\textsuperscript{13} various geometrical shapes such as squares, circles, pentagons, and octagons are tied together and set along the diagonal axis. (Figure 12) Basically, the house has a butterfly layout on a 45-degree axis, with a central hall in the middle and two wings that are embracing a garden. A pantry, kitchen, and dining room are aligned to the left of the hall. One wing is occupied by a library and music room, while the other wing features a family sitting room.\textsuperscript{14}

6. Conclusion

Schindler’s Beach house was demolished, but the destruction of houses is no new phenomenon. Some great houses have barely outlived their creators, such as Irving Gill’s Dodge house\textsuperscript{15} and Schindler’s famed designs such as the Packard house and the Wolfe

\textbf{Figure 11.} C.F.A. Voyage, the ground and first floor plan of the Annesley Lodge in London.

\textbf{Figure 12.} F.L. Wright, The Henry Cooper House (1887) in La Grange, Illinois (Redrawn by Ro, Dongyun).

\textsuperscript{11}Kornwol (1972) argues that Prior’s “The Barn” is “only the first of a number of similarly diagonal axial schemes of Baroque origin.”

\textsuperscript{12}Frampton (1980) also mentions that the “butterfly” plan-form of Hermann Muthesius’ Freudenberg House was influenced by Edward Prior’s “The Barn”.

\textsuperscript{13}Kathryn Smith (2017) writes that Wright showed the elevation drawing of the house to Sullivan when he was applying for the job as his draftsman. It seems that the design of the house was fine tuned into a residence for the Henry N. Cooper House (1890) while working for Adler and Sullivan.

\textsuperscript{14}Neil Levine points out that the “butterfly plan”, as it was called in Late-Victorian England, had an obvious source in the project for a townhouse by Viollet-le-Duc (1889) and explains more about Wright’s subsequent use of diagonal axis up to his later designs (Searing 1982).

\textsuperscript{15}The Dodge house of Irving Gill was located a block north of Schindler’s own house and studio at Kings Road and destroyed in 1916. The Packard house and the Wolfe house were both destroyed in 2000.
house. For Schindler, an eternal part of the building is essentially not durable material but “eternal conception.” This means that the idea behind the design will be everlasting. Nevertheless, a set of drawings still exists, and some pictures of the house have barely survived.

Through an in-depth analysis of the Beach house, it turns out that the diagonal planning along with the unit system are a central theme of the house like his earlier works including the Free Public Library of 1920 (Park 1996) and the How House of 1925. The unit system is based on simple whole numbers where the architect can think and imagine the size relations in the mind. The Beach house also generates sets of simple ratios, which are based on simple whole numbers. Although most rooms are irregular shapes, all dimensions are integer multiples of the basic unit. It assures that Schindler was able to handle the unit system palpably and precisely to conceive the space form in his mind. In addition, it is deductible that the approach is derived from his early interests in rectangular dimensions arranged in “rows.” Unlike his early designs, Schindler’s use of the unit system is not evidently identified on the drawings of the house. Although the unit system is not identifiable in the drawings, it surely serves as a coherent system of units toward a harmonious spatial composition. They in fact are triggered and superimposed in the creation of Schindler’s designs.

The use of the diagonal planning was deeply rooted in his early education in Vienna as well as Wright’s influence. Schindler continued to develop the butterfly layout with masterly skill. The use of the butterfly layout in the Beach house was unique in that an equilateral triangle is inscribed within. At a look, the composition appears to be arbitrary; yet, the analysis demonstrates that the logical and methodical process was implemented to plan and design the house.

The combination of the diagonal planning along with the unit system in the design underlies the essential simplicity of the interior and exterior and gives us a better understanding of Schindler’s purposeful articulation of later angular designs. Although unit design never appears as readable method at a glance, it serves as an underlying principle of spatial composition as well as the location of details. Undoubtedly, the articulation of symmetry as well as the unit system for Schindler arose not only out of his concern for conceptual clarity and practical convention, but also from a desire to use such a method in the support of spatial composition of his space forms.

To sum up, the authors believe that the house deserves a prime significance among the accomplished projects of the 1930s. In its methodical originality, it surely stands out the most as a unique process, although it is a relatively small project.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by an INHA UNIVERSITY Research Grant.

References

Banham, R. 1980. Theory and Design in the First Machine Age. Cambridge: MIT Press.

Frampton, K. 1980. Modern Architecture. London: Thames and Hudson.

Gebhard, D. 1980. Schindler. Santa Barbara and Salk Lake City: Peregrine Smith.

Gebhard, D. 1993. The Architectural Drawings of R.M. Schindler. Vol. 4. New York: Garland Publishing.

Gebhard, D., and R. Winter. 2003. An Architectural Guidebook to Los Angeles. Salt Lake City: Gibbs Smith.

Kornwol, J. 1972. M. H. Baillie Scott and the Arts and Crafts Movement. Baltimore and London: Johns Hopkins Press.

March, L. 2003. “Rudolph M. Schindler: Space Reference Frame, Modular Coordination and the ‘Row.’” Nexus Network Journal 5 (2): 51–64. doi:10.1007/s00004-003-0016-x.

March, L., and J. Sheine, ed. 1994. R. M. Schindler: Composition and Construction. London: Academy Editions.

Marcus, K. 2016. Schoenborg and Hollywood Modernism. Cambridge: Cambridge University Press.

Melendo, J. M. A. Melendo, J. R. J. Verdejo, I. D. S. de la Blanca, et al. 2014. “Similarities between R.M. Schindler House and Descriptions of Traditional Japanese Architecture.” Journal of Asian Architecture and Building Engineering 13 (1): 41–48. doi:10.1310/jaabe.13.41.

Mitchell, R. 2011. “The Anna Zacek Cottage: Addendum to Los Angeles Department of City Planning Recommendation Report.” Case No. CHC-2011-2619-1CM.

Nicholls, D., ed. 2002. The Cambridge Companion to John Cage. Cambridge: Cambridge University Press.

Park, J. 1996. “Schindler, Symmetry and the Free Public Library, 1920.” Architectural Research Quarterly 2 (2): 72–83. doi:10.1017/S1359135500001275.

Park, J. 1999. “The Architecture of Rudolph Michael Schindler (1887–1953)– The Formal Analysis of Unbuilt Work.” Ph.D. diss., University of California, Los Angeles. doi:10.1469/j-1809.1999.6320101.x.

Park, J. 2000. “Subsymmetry Analysis of Architectural Designs: Some Examples.” Environment and Planning B: Planning and Design 27 (1): 121–136. doi:10.1068/b2462.

Park, J. 2003. “Rudolph M. Schindler: Proportion, Scale and the ‘Row’.” Nexus Network Journal 5 (2): 60–72. doi:10.1007/s00004-003-0017-9.

Park, J. 2004. “Symmetry and Subsymmetry as Characteristic of Form-making the Schindler Shelter.” Journal of Architectural and Planning Research 21 (1): 24–37.

Park, J. 2006. “R. M. Schindler’s Theory of Space Architecture and Its Theoretic Application to Space Development of 1945.” The Journal of Architecture 11 (1): 37–54. doi:10.1080/13602360600366065.

Park, J. 2015. “House Growing Out of Site”: The Case of Rudolph M. Schindler.” Journal of Asian Architecture and Building Engineering 14 (3): 513–520. doi:10.3130/jaabe.14.513.

Park, J., and J-L. Park. 2013. “The Underlying Geometry in Rudolph M. Schindler’s Packard House.” Journal of Asian Architecture and Building Engineering 12 (1): 9–15. doi:10.3130/jaabe.12.9.

Schindler, R. 1934. “Space Architecture.” Dune Forum 1: 44–46.

Schindler, R. 1946. “Reference Frames in Space.” Architect and Engineer, San Francisco 165 10 (40): 44–45.
Scott, B. 1906. *Houses and Gardens*. London: George Newnes.

Searing, H., edited by. 1982. “Frank Lloyd Wright’s Diagonal Planning.” In *Search of Modern Architecture*. New York and Cambridge: Architectural History Foundation and The MIT Press.

Sheine, J. 2001. *R.M. Schindler*. New York: Phaidon Press.

Smith, K. 2017. *Wright on Exhibit: Frank Lloyd Wright’s Architectural Exhibitions*. Princeton: Princeton University Press.

Tombesi, P. 1995. “Rethinking Urban Mobility and Centrality: An Angeleno Perspective.” *Cartas Urbanas* No.5, Arquitectura.

Vaught, S. 2016. “Take a Look inside Howard Hughes’s Hacienda-Style Residence in Los Angeles.” *Architectural Digest*. September 22.

Viollet-le-Duc, E. 1889. *Discourse on Architecture*. Translated by Benjamin Bucknall. Boston: Ticknor.