

Architectural Draughtsmanship

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Editors

Architectural Draughtsmanship

From Analog to Digital Narratives

 Springer

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Preface

The book presented here is a compilation of articles collected under the title *Architectural Draughtsmanship: EGA (Architectural Graphic Expression) From Analog to Digital Narratives*. It is the result of the International Congress EGA (Architectural Graphic Expression)16 held in Alcala de Henares in June 2016 with the subheading: “Teaching and researching in architectural graphic expression.”

This was the 16th edition of the Congress, and it was again centered on the exchange of knowledge of what is taking place within the arena of architectural graphic expression inside and outside of our country.

The implementation of a successive curriculum over a short period of time (BA in Architecture, BA in Fundamentals of Architecture, Master of Architecture and Ph.D.) has led to the necessity of restructuring all areas of study within this field, and for that reason, it seemed the right moment to turn our attention to the work of professors and researchers. As the last Doctor Honoris Causa of the University of Alcala Kenneth Frampton said in his acceptance speech, we have to reclaim innovation by starting from tradition, both in terms of architecture and educational disciplines attached to it.

This book is organized into two major parts:

A/ Research into the field of architectural graphic expression, including related areas of education, in which innovative experiences have been presented in the new curricula,

B/ and how to teach research methods that are essential to the work and experiences found in the field of postgraduate studies.

The editors have grouped the articles into four major chapters, according to their individual subjects:

1. Innovation Teaching Strategies (Teaching experiences applied in EGA).
2. Design and Education (General education concepts in EGA).
3. Design and Architecture (Design issues related to current architectural practice).
4. History and Cultural Heritage (History of a particular designs and/or the design’s application within the architectural heritage).

Blind pairs reviewed all articles as a guarantee of quality in order to obtain the recognition of the scientific community.

All the works are in English, although they may have originally been written in one of the languages of the Congress, either Spanish, Italian, or Portuguese, with the goal of emphasizing their respective international characters.

We believe this compilation of articles could be the trigger to start a new collection of books about the international relevance of architectural graphic expression. It is the result of the important contributions taken from the congresses dedicated to the subject that have been held regularly for over thirty years, with the participation of a large number of researchers from European and Latin-American countries.

Alcalá de Henares, Spain

Enrique Castaño Perea
Ernesto Echeverría Valiente

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Barbara Sokołowska Brukalski. Graphic Analysis of the House on Niegolewskiego Street

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Abstract The project analyzed in this paper by the critical and digital redrawing is the House on Niegolewskiego Street of 1927–28, designed by Barbara Sokołowska for her and her husband, Stanislaw Brukalski, inspired by the Neoplasticism ideas, the paintings of Mondrian and De Stijl. In its details the house seems to recall that one in Utrecht by G.T. Rietveld of 1924, with a very large living room, a studio overlooking a double height and a spiral stair connecting the two floors into one space defined by translated planes and pure volumes.

Keywords Representation · Graphic analysis · Barbara Sokołowska Brukalski

1 Introduction

Between 1920s and 1930s, Europe was characterized by a cultural, economic and political scene that involved the reconstruction of many cities, partly destroyed by war. In this social context in Poland was stimulated the formation of several avant-garde groups that carried on modern ideas, opposed to the previous Warsaw traditionalism, already exposed through CIAM, Werkbund, Bauhaus, De Stijl, Constructivism and Suprematism trends (Boscolo 2005; Quilici 1991).

After the first Polish avant-garde group, i.e. the Formists, in 1919–21 other groups, Blok and Praesens, characterized the architectural scene that began to affect architects and artists connected to the contemporary avant-garde visions. The main aim was to address social problems of that time through the track marked by functionalist thinking of the Modern Movement introduced in Poland by these nascent groups (Chionne 2005, 199–229).

Three groups distinguished above all within Praesens with the aim of creating low-cost housing and minimum dwellings in response to the emerging social issues (Malczyk 2002). One of the most emblematic figures of this Warsaw cultural

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revolution was surely Barbara Sokołowska Brukalski who, together with her husband Stanisław Brukalski, participated to the avant-garde activity of Praesens, acquiring many principles of the Modern Movement linked to the expression of functional rigor and the formal purity in architecture. Barbara Sokołowska graduated at the Warsaw Technical Academy (1921–1932) and began working with her husband in 1927, with whom designed some houses in Niegolweskiego Street between 1927 and 1929, participating at several international exhibitions including the 1st International Exhibition of Modern Architecture in Warsaw in 1926, the Modernists' Salon in Warsaw and Vilnius in 1928, the 1st Exhibition of Praesens in Warsaw in 1926 (Boscolo 2007). Another important collaboration for Barbara was with the architect Nina Jankowska in the '30s, with whom she designed the Dom i Ogród (House and Garden). After II World War Barbara Sokołowska was actively involved in the reconstruction of a new Warsaw building Pod Orłami Bank, Czapski Palace, interiors of the Old Town Square's buildings and even several churches.¹ Barbara Sokołowska joined the Praesens in 1929 and participated in CIAM 4 in 1927 beginning to interface herself with the emerging social issues. She was particularly inspired by personalities linked to the Russian Suprematism and as demonstrated by the issues covered in the quarterly Praesens, of which were printed only two numbers, and where were cited the works of Malevich, van Doesburg, Mondrian, Oud and addressed topics related to architectural utilitarianism, industrialization, prefabrication and standardization of building elements, as well as social and economic issues of building (Kłosiewicz 2005, 157–198). Barbara's work, always reflecting the need for a minimum and functional space, is the result of a mathematical composition between geometry of the plan and neoplastic line of the building. Furthermore, embracing the new culture of the project related to the standardization process of construction and to the housing and economic needs of that time, she glimpsed in contemporary architecture the chance to approaching to building prefabrication and low-cost materials (Bojko 2005).

She constantly alternated professional activity with felt social and cultural commitment participating always with alacrity to the cultural revolutions of that time. She was the first responsible of several buildings in Zoliborz, the emblem district of the revolutionary ideas flow of polish architecture, where also worked important figures of Praesens in 1927 (Heynickx and Avermaete 2012, 96).

Barbara had a leading role among the members of the first generation of Polish women architects, and because of her fame and experience achieved over the years, she was the first woman in the Department of Architecture at the Technical Academy of Warsaw (Leśniakowska 2011).

One of her projects more linked to the polish avant-garde was the studio-house in Niegolewskiego Street designed in 1927–29, particularly influenced by De Stijl

¹Jerzyska k. Węgrowa, 1948–1965; Izabelin k. Pruszkowa, 1952; Troszyn k. Ostrołęki, 1956–1979; Ostrołęka 1958–1961; Sypniewo k. Makowa Mazowieckiego, 1969–1974. Cfr. Marta Leśniakowska, *The Brukalskis' Poetics of the Avant-garde*, in "Culture.PL", 2001 (Retrieved from: <http://culture.pl/en/artist/the-brukalskis-poetics-of-the-avant-garde>. 18.9.15).

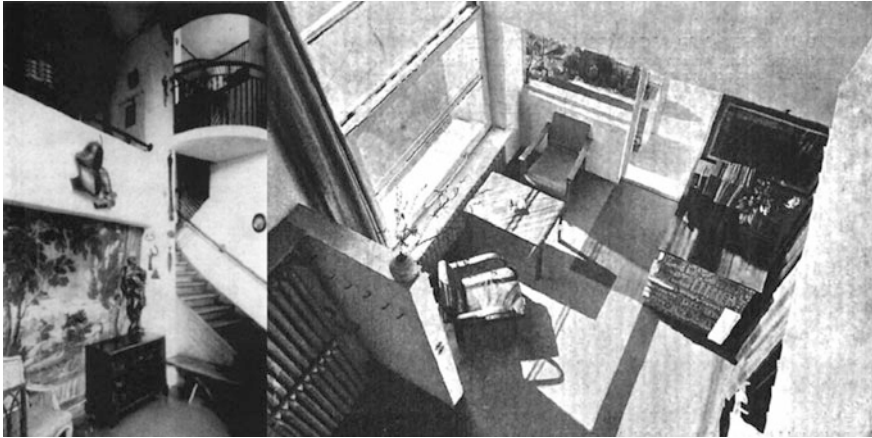


Fig. 1 View of the stair and double height living room of the House in Niegolewskiego Street

principles and inspired by the house in Utrecht, designed by Gerrit Thomas Rietveld in 1924 (Fig. 1).

This project was an expression form of the Polish architects' new generation that included names like Helena Niemirowska and Szymon Syrkus, Bohdan Lachert, Jozef Szanajca, Mieczyslaw Szczuka and Teresa Zarnowerowna or artists as Edgar Norwerth, Wladyslaw Strzeminski and Katarzyna Kobro, strongly influenced by Russian avant-garde (Klosiewicz 2005, 157–198).

Architecture was a path that Barbara knowingly undertaken with the aim of identifying in it a means to express ideas of a new aesthetic and synthesis of all arts.

As Helena Niemirowska did, another important figure of Polish architectural revolution, also Barbara in her work adopted a socio-architectural attitude in response to the Polish avant-garde issues. Indeed she handled different architectural scales, from the urban to the building one, also devoted herself to the furniture and garden design, since she studied at the Central Agricultural School.

Sokołowska belonged to the so-called second generation of architects, i.e. born after 1895, better known as youthful rebellion, but her idea of modern architecture did not fit completely with that one carried out by the leftist architects who converged in the avant-garde Block group (Marchi 2005). The socio-cultural environment where Barbara trained was particularly rich of international influences derived from academies of Vienna, Dresden, Karlsruhe, Graz, and Darmstadt, and Russian universities, especially from St. Petersburg; also because independence of Poland was proclaimed in 1918 and after that it started to define a new political condition after 150 years of subjection. In this context we recognize a mingling of traditional and vanguard architecture which characterized Barbara Sokołowska's project (Niezabietowski 1995).

The Polish pioneer saw a social responsibility in architecture consisting of a combination of classicism and modernism particularly influenced by the strong

interest of her husband Stanislaw for the Italian futurism, and her studies carried on at the Central Agricultural School, addressed to a neo-romanticism that she always revisited in her gardens designs considered such as artistic natural elements: they were architecture quotations that defined a romantic spirit linked to the polish tradition with rigor and geometry of modern architecture project.

Barbara always saw the strong relationship between architecture and nature and between man and nature, in which she perceived an important urban element for the construction of public spaces open to all. Following the collaboration with her friend Jankowska, for the project of some interiors of the Warsaw Building Cooperative in Żoliborz, arose new composition issues defining a sort of manifesto of the new polish aesthetic, in which natural and tradition elements were mixed with pure volumes of modern architecture.

In this deconstruction and construction process of principles spread at international level, also several artists were involved from the Warsaw School of Fine Arts. Because of the close collaboration between art and architecture Brukalskis adhered to the *Lad Visual Artists' Cooperative*, which proposed a modern mingling among modern vanguard, folk motifs and traditional construction techniques (Leśniakowska 2011).

The project that best defines the work of Barbara Sokołowska was the Lounge Room for the Polish Pavilion presented at the International Exhibition of 1937 in Paris. It was known as airplane builder's room, furnished with the works of the sculptor August Zamoyski, influenced by cubism and futurism and with the famous chair covered with white sheepskin, combining vanguard, neo-romanticism and classicism.

Her style was unique and personalized, with soft furnishings, sinuous shapes and natural materials, together with a kind of primitivism that critics also admired for the audacity with which Barbara combined everything. Moreover, it was this attitude on the use of materials and shapes, tradition and avant-garde, which featured the new Warsaw expression and aesthetics of interiors (Tonini 2005).

You can identify another moment from which Barbara Sokołowska was the name of female architecture belonging not only to the Polish vanguard but also to that international one. Indeed, in 1927 she designed a kitchen for the residential housings Warsaw Residential Cooperative one year after Greta Schütte-Lichotzky made her Frankfurt Kitchen. As for the project of the kitchen, Barbara resorted to an innovative material at that time, linoleum, which revisited for the Compact Apartment Program of 1930, initiated by the Praesens.

Barbara Sokołowska kept in contact also with Le Corbusier, because of her involving in CIAM, who strongly influenced the Polish architect, as you can notice from her graduation project Apartment House of 1934, with two floors, large strip windows, spiral stair and walkways that reflected the traits of *Maison La Roche-Jeanneret* in Paris of 1924. The eclectic style of Sokołowska is also evident from the detail of her interior designs, often with quotes from the Charlotte Perriand's projects and ideal housewife guides thinking of an architecture which took into account the needs of man and at the same time that ennobled everyday architecture.

After II World War Barbara with her husband tried to transmit their knowledge to the students of the Department of Architecture at the Warsaw Technical Academy according a multifaceted teaching methodology treating different issues of architectural design, regardless of the scale. She published also a textbook summarizing her ideas entitled *Principles in Designing Housing Estates* in 1948 but it was withdrawn from circulation because of political reasons.

Many were the contributions of Barbara Sokołowska to polish modern architecture. Her consistency in the design of domestic space, functionality of laboratory-kitchen type designed in 1930 and used until the '80s by offices in Poland, elegance of gardens designs and the comfort of her furniture, were elements that defined her revolutionary position both for the interior design field and for different scales of architecture, mostly in the period between the two world wars.

2 Graphic Analysis of the House on Niegolewskiego Street (1927–28)

The project here analyzed through the redrawing as a methodology of critical knowledge deals with the House on Niegolewskiego Street of 1927–28, located in the same neighborhood where, with her husband, Barbara realized some dwellings. The mixture of De Stijl outside and the interior strongly influenced by lecorbuserian project took critics to define her project the most emblematic example of modern architecture in Poland (Leśniakowska 2011). The studio-house designed for her and her husband, is on three floors with a practicable flat roof (Fig. 2).

The graphic interpretation is based on the study of three plans of the original project and one elevation, in correspondence of the main entrance. In these drawings there are notations of dimensions only into two rooms: kitchen-living room of the ground floor (corresponding to the long side of one of the two rectangles that constitute the base of the entire volume) and the studio on the first floor.

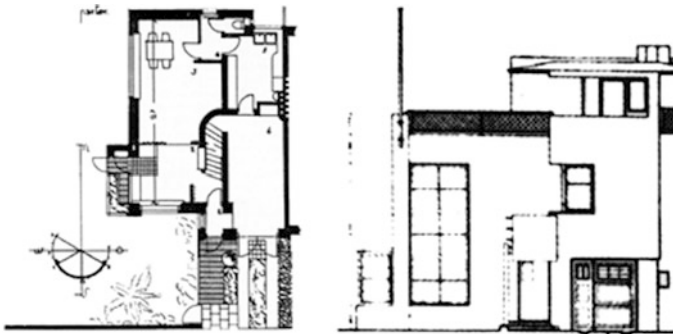


Fig. 2 Archive drawings of plans and the elevations of the House in Niegolewskiego Street

From other annotations you can identify the functional organization of the house and a clockwise progressive numbering, starting from the main entrance. In the ground floor you can identify a double height living room, with a jutting covered terrace almost entirely glazed and one window that looks onto the garden, a recalling of her Central Agricultural School studies; a dining room, with a large window that probably Barbara Sokołowska had placed to take advantage of the natural light; a hall, which gives access to a bathroom and a kitchen, and finally a large space also accessible by a second entrance where there are not furnishings notations.

The first floor plan shows the numbering that identifies three rooms accessible from the stair: the studio illuminated by a large window of the same size of that one in the kitchen; the bathroom and the bedroom with a small terrace. The third floor, in correspondence of the practicable flat roof, with a not furnished room, and a window which holes the projecting volume of the base rectangle.

The fulcrum of the project is represented by the staircase around which are developed in a centripetal way interior spaces. A translation and rotation movement that almost seems to reverberate the vertical action on the other elements of the architectural volume, starting from the sliding of the two base rectangles that glide in correspondence of the staircase and break perpendicular planes which delimit the skin building. They are elements that mark movements of planes such as the rotation caused by the ascent around the center of the house, or translation, in the small terrace of the first floor of the rail suspended over the flat and held with only two steel tubulars, neoplastic quotation that make lighter and more transparent the flatness of vertical space with respect to the building footprint (Figs. 3 and 4).

The rhythm of the floors scanning is also horizontally traceable, indeed, the slippage of the surfaces determines the definition of other points of view, as an extension of the roof on the short side which shows the deviation between the two rectangles giving the chance to turn around the large volume of the staircase.

The motif of the stair is an element of visual balance in the drawing of the façade on Niegolewskiego Street that can ideally be divided into two main areas, that one of the large glazed surface of the dining room on the ground floor and the studio on the first floor and which one at the second floor that on the vertical axe tracks other small openings staggered between them. A sphere placed in front of the main entrance expresses before entering the house an idea strongly linked to the rotating incessant movement, the same of the staircase. Furthermore, it states the idea of space of Barbara Sokołowska: pure volumes, white color and plasticity of form (Fig. 5).

By redrawing these archive drawings it is possible to understand some of the intimate features of the project, scanning of spaces, attention to the interior lighting, the double-height living room that in the tridimensional view maintains the fluidity of space already perceived through plans and functional distribution of spaces developed around the staircase, a real walk in the house which keeps the visual control within a vertical shift. The redrawing included the revision of three plans and elevations and two sections crossing the staircase, both longitudinally and transversely, to catch the composition changes of project (Fig. 6).

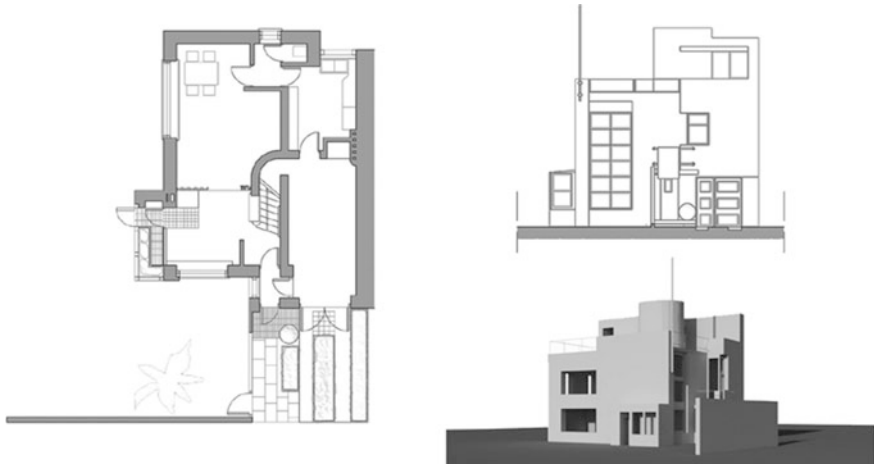


Fig. 3 Redrawings of ground floor plan, main elevation and perspective view

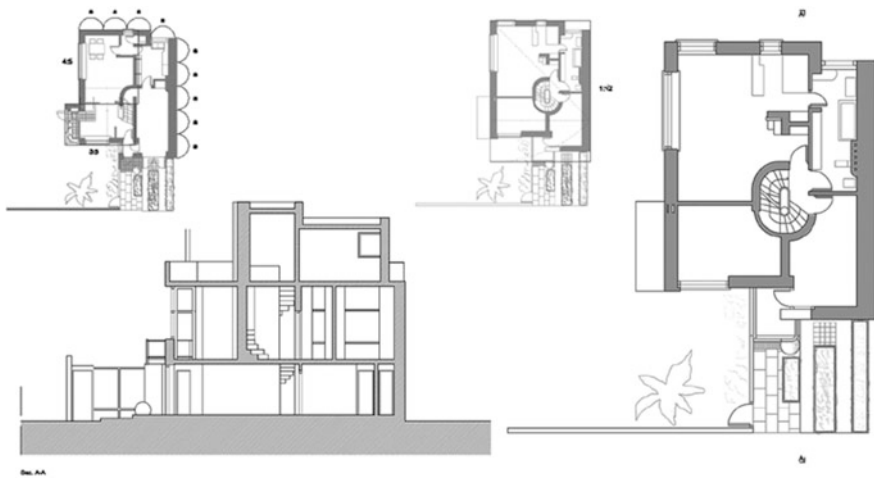


Fig. 4 Redrawing of first floor, longitudinal section and harmonic ratios

This graphic information are supported by a study on harmonic relationships traced within the project of Barbara Sokołowska, in plans and elevations, which allowed the understanding of the archive drawings through an interpretive reading on spatial and proportion rhythm of architecture. Indeed, the plan of the ground floor is inscribed in a diagonea (ratio $1:\sqrt{2}$) that includes a golden section in the rectangle with larger area; it has been traced the repetition of a reference module for 5 times in the long side of the plan and 4 times in the short side (Fig. 7).

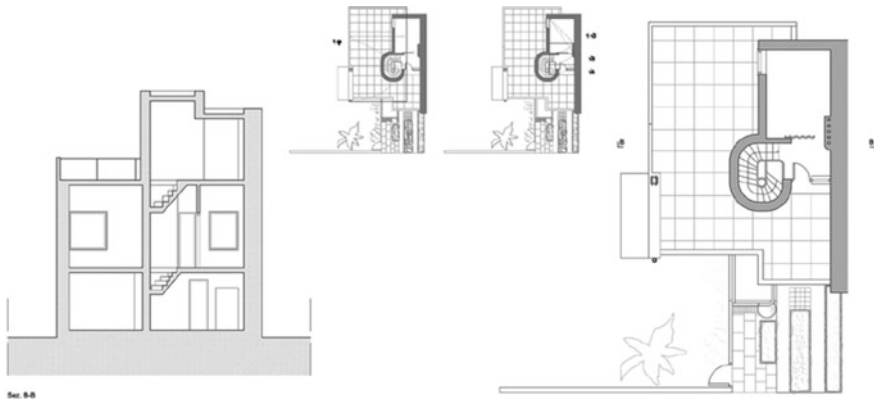


Fig. 5 Redrawing of roof plan, section and harmonic ratios

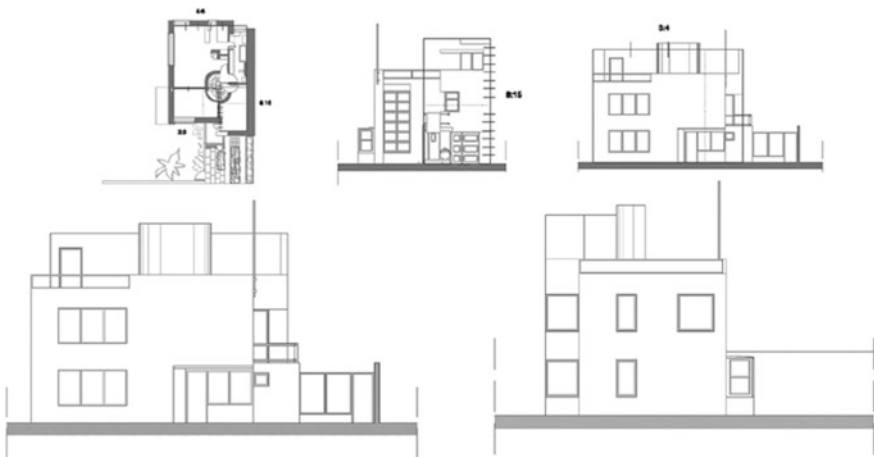


Fig. 6 Redrawing of elevations and harmonic ratios

Also they were inscribed in harmonic relationships, such as a major sixth (ratio 3:5) in the living room and a major third (ratio 4:5) in the dining room, at the ground floor plan; while in the plan of the first floor a minor third (ratio 5:6) in correspondence of the studio and bath, a double diatessaron (ratio 9:16) in the bedroom and a diapente (ratio 2:3) in the double height space have been traced. The volume that protrudes in the roof, in correspondence of the blind wall of the building in the series of four dynamic rectangles (ratios $1:\sqrt{2}$, $1:\sqrt{3}$, $1:\sqrt{4}$) has been inscribed. Even in elevations two harmonic ratios have been traced, in the main one a major seventh (ratio 8:15) and in the lateral one a diatessaron (ratio 3:4).

Other drawings produced to investigate the project Barbara Sokołowska project in its spatial complexity include two axonometric projections, which in their wire frame definition hold the three dimensions around one point, the origin of the

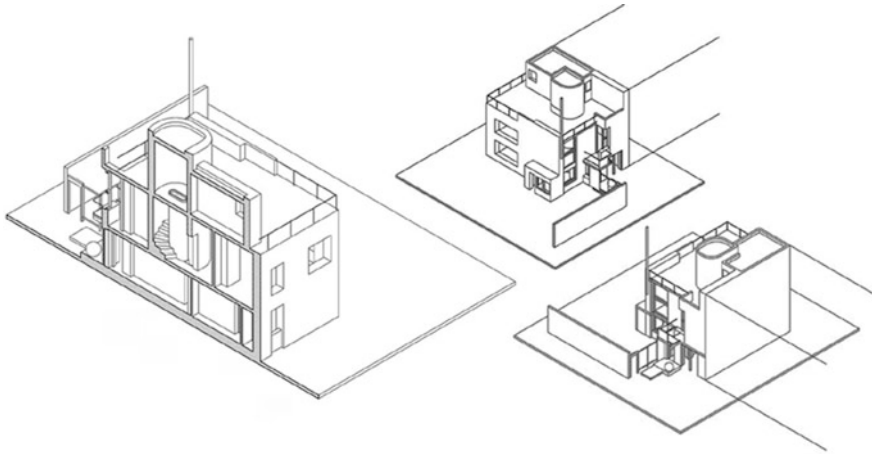


Fig. 7 Axonometric section and axonometric projections of the studio-house

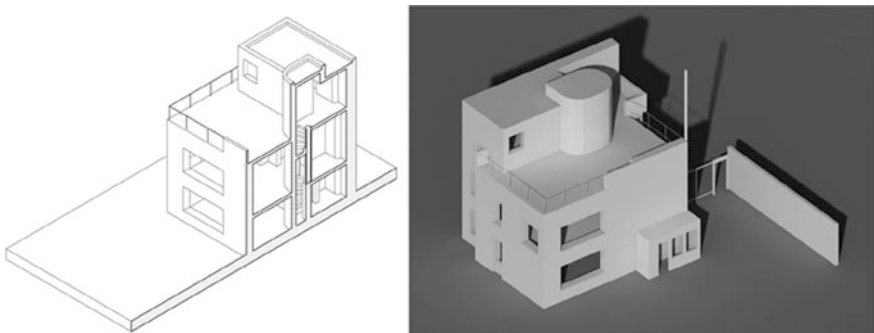


Fig. 8 Axonometric section and axonometric view of the house

geometric structure and at the same time recall the centripetal movement caused by internal staircase and reverberated on the external volumes. In the two isometric views, the volume has been cut in correspondence with the staircase, to dissect architecture in its spatial shifts between the inside and the outside of the house (Fig. 8).

But it is in the exploded view that the Barbara Sokołowskas project is broken down to show the metric-spatial ratios that exist between the two-dimensional view of plan and the three-dimensional one of axonometric view; a graphic synthesis which, together with other orthogonal projections, define one of the different knowledge phases of the project (Fig. 9).

The drawings presented as a further step in the graphic study include two renderings in an isometric view from above, that capture the volume complexity and the spatial organization of the project; three perspective views with a height of

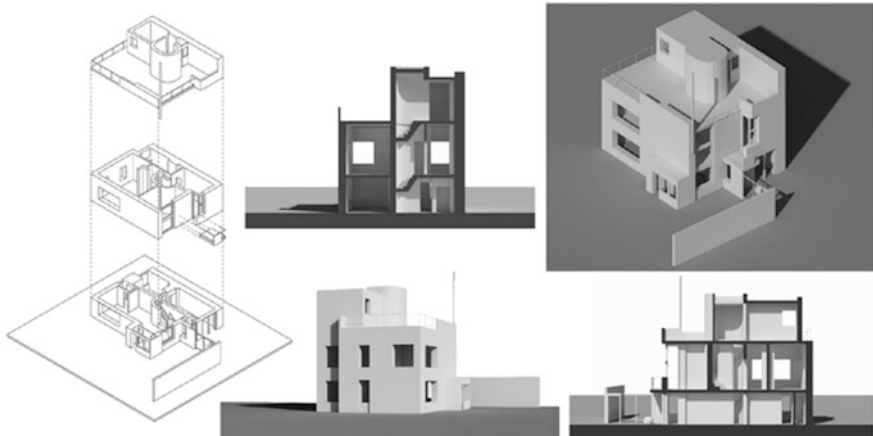


Fig. 9 Exploded view, axonometric views, perspective sections

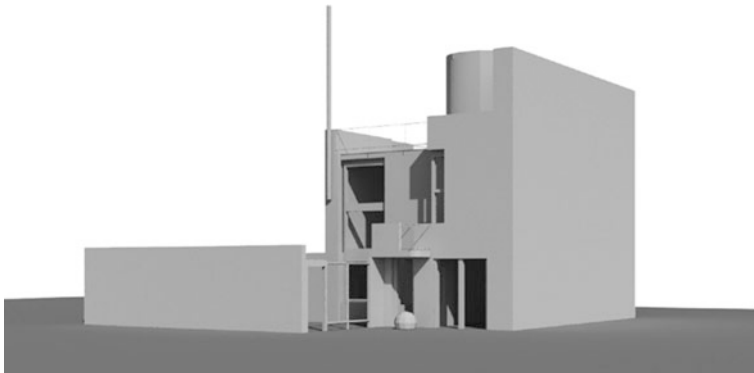


Fig. 10 Rendering of the studio-house

1.70 m to track the visual contact and the relationship between man and architecture recognizing the space around the building; the last two drawings include two perspective sections that enrich the information provided by section through the sense of spatial depth of perspective (Fig. 10).

3 Conclusions

The pioneering work of Barbara Sokołowska defined in Poland between the two world wars a new feature and compositional practice of architecture, closer to the elements that characterize the Modern Movement and the artistic avant-garde already internationally spread. Knowledge related to modern architecture of

international style and the revolutionary air breathed during the entire period of her training characterized the figure of one of the modern movement pioneers who had actively participated to the definition of a Polish style steeped in volumetric purity and innovative materials, for one hand, and in Warsaw traditionalism and neo-romanticism from the other one.

The study of Barbara Sokołowska project, through the slow and inquiring eye of drawing, allowed to trace further handwritings of Polish architect, providing digital interpretations of an eclectic, revolutionary and interested to the needs of the time architecture's figure.

The white volumes described in renderings represent a further moment of reflection about the spatiality interpreted by archive drawings that deliberately describe pure architecture, in which solids and light build a new project, that takes form through the graphic interpretation in the silence of paper, crystallizes the contemporary handwriting and creates a new starting point for the knowledge of the Barbara Sokołowska project.

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