STUDY ON THE CHARACTERISTICS OF MIES VAN DER ROHE’S DESIGN PROCESS OF EARLY 1930’S HOUSES (1)

Significance of Perspective Drawings of the Gericke House Conception

ミース・ファン・デル・ローハの1930年代前期住宅建築の設計過程における特質（1）

Juan Rufino CASTILLO* and Toshimasa SUGIMOTO**

The present research studies the characteristics of Mies van der Rohe’s design process of Gericke House (1932). Mies represented the main creative process in aerial views (design of volumes) and in eye level perspectives (composition of space). Our results were possible using CAD models that helped us to see the relevant characteristics of conceptual sketches. Through the three-dimensional reconstruction of six important stages of design (aerial views) we have visualized that Mies’ formal evolution is based on volumetric interplay between the zones of imaginary floor plans. And through the CAD projection of the final proposal’s main eye level perspectives, we clarified Mies’s tendency of drafting deep views into horizontal frames regarding outer and inner spaces equally important for his design process.

Keywords: Mies van der Rohe, design process, Computer Aided Design (CAD), perspective drawings

I. Introduction

Gericke House was a project for a competition held in 1932. Mies’s project was rejected but it is among his most mature domestic designs, where he reworked the principles attained during the 1920’s and went a further step in the solution of a modern house.

The present research is the first part of a large thesis that studies four houses of Mies designed during the 1930’s (Gericke House, Mountain House, Hubbe House, and Court-Houses). Our general aim is to analyze, through the reconstruction of Mies’s sketches or drawings using CAD, the characteristics of his design process that other researchers have not discussed in detail yet. Some have written about the space of these houses, but none have study Mies’s design process graphically; we take the challenge of it here. On the Gericke House case, Wolf Tegethoff has analyzed its ‘design factors’; Franz Schulze compared it to “Tugendhat House and the villas of the 1920’s”; Richard Pommer thinks of the House as “the passage through deep space to Nature”; Fritz Neumeyer wrote on the competition outcome; Kenneth Frampton comments on the tectonic ‘synthesis’ of its space; and Janos Bonta on its relation to the Court Houses. Other researchers had only mentioned this house in the work chronology of Mies. The second aim of this research is to analyze the graphic manners of Mies that sustain the significance of his perspective drawings.

We have reproduced the original drawings from The Mies van der Rohe Archive. According to Franz Schulze they include the most complete extant set of presentation drawings of a single project by Mies’s hand.

Gericke House was to be located at the western suburb of Berlin. The site has the Wannsee Lake at East, a forest of old trees at North and South, and Grosse Seestrasse Street at West. The house is organized in two levels where the main areas considered during the design process were the living and dining rooms, the ‘living-room garden’, and the parent’s bedrooms. The main entrance is on the upper level connected to several bedrooms and a ‘garden terrace’. The ‘living-room garden’ is accessed through the living room and the parent’s bedroom; both areas mainly enclosed in glass (fig. 1).
II. Method of Analysis

The Archive basically documents three types of drawings on Gericke House: forty aerial views, fifty-seven 'partial plans', and thirty-seven 'eye level perspectives'. Mies drew most of drawings on freehand except for three elevations and two floor plans. The aerial views and the one-point perspectives correspond to several stages of design, whereas the partial plans are variations of the final proposal.

1) Analysis of Aerial views

We used the aerial views to study the proposals created during the design process. After careful considerations we selected five relevant aerial views that with the final proposal were organized in a sequence of six versions. As Mies omitted specific plans, the reconstruction of the zoning plans represented here were possible projecting the aerial view over a 1x1m grid after scaling the original sketch to a 3.00m ceiling (e.g., fig. 2). The three-dimensional CAD models follow the zoning plans, 3.00m ceiling height on lower level and 2.75m on the upper. We made the reconstruction mainly from graphic sources, because drawings were the principal medium between Mies and his vision during the design creation. We then proceeded with the method of analysis based on the original sketch ideas complemented by the CAD linear drawing and zoning plans. This analysis clarifies the transformation of architectural concepts in the design process of Mies.

2) Analysis of perspective drawings

The eye level perspectives were useful to analyze the drafting manners of Mies. First, we chose two exterior and two interior views that explain the general concept of the house. Second, we determined the angle and viewpoint of the original drawing. And third, we reconstructed the 'final proposal' CAD model following the original floor plans, elevations and building program. They were represented following the same horizon and vanishing points of the original sketches. The method of analysis is based on comparisons between original drawings and reconstructed CAD views and aims to clarify the conceptual basis sustaining Mies's graphics.

III. Analysis of Aerial Views

Mies was aware of the importance of isometric projections in modern design through his contact with the members of De Stijil, but he preferred to use aerial views to foresee his formal concepts. At the outset, Mies's views seem to be similar to axonometrics or isometrics, but in fact they are two-point perspectives. The differences are slight and seem to be a drafting error though this manner is repeated in all his aerial views. Mies drew them with careful proportion, that is, the sizes of columns, ceiling heights and landscape elements are very similar in all aerial views as if he was using the same imaginary three-dimensional grid. As was customary to Mies, he restricted his formal repertoire to Cartesian coordinate systems resulting in a composition of flat roofs, straight walls and ninety-degree disposition characteristic of the "modern" atmosphere at the time. The placement of trees and the sloping condition of the terrain (the main landscape elements) were drawn in a free way; sometimes he only traced hasty curvilinear contours suggesting foliage or an unfinished curved line remarking the change of topography. Therefore, two basic things were always present in his aerial views: the condition of the site and the form of the house.

We have selected six different versions in order to see how several architectural ideas are applied to the same concept. The general design concept is based on volumetric balance where the main task of Mies was to define the entrance approach, the living room garden and the garden terrace. The main changes among versions happen in these areas, whereas volumes are constantly staggered from northeast to southwest across the site.

Version-1 (fig. 3a) is the only that proposes a house finished of brick, glass, and concrete. Two chimneys remark the volumetric composition. The 'living-room garden' is divided into two terraces, and could be accessed from the entrance approach,
ORGANIZATION OF PROPOSALS

a. VERSION 1 (Archive No.42.27, Volume 3, p.306)

b. VERSION 2 (Archive No.42.29, Volume 3, p.316)

c. VERSION 3 (Archive No.42.25, Volume 3, p.315)

d. VERSION 4 (Archive No.42.60, Volume 3, p.293)

e. VERSION 5 (Archive No.42.59, Volume 3, p.295)

f. VERSION 6 (Final Proposal)

NO FINAL PROPOSAL ORIGINAL AERIAL VIEWS FOUND.

LEGEND:

- Entrance approach
- Living areas
- Service areas

Fig. 3. AERIAL VIEWS ANALYSIS
which is defined by the service wing. The main living room is closed off mainly with glass walls and with a brick wall at south.

Version-2 (fig.3.b) was to be finished of concrete and glass. Like version 1, its service wing is aligned to the existing retaining wall. The garden terrace is lifted on stilts as an elevated courtyard open to the living-room garden. The only chimney is at the north of the glass living room

Version-3 (fig.3.c) relates versions 2 and 4 because the places of the service wing and the main living room are the same in the three schemes, the garden terrace forms an elevated courtyard like in version 2, and the living-room garden became smaller like in Version 4.

Version-4 (fig. 3.d) has staggered volumes like in the previous proposals. It was to be finished in concrete and glass, and the chimney is attached to the east wall of the terrace. This scheme is similar to the final proposal (version 6) except for the service wing that is still aligned to the existing retaining wall and lifted on stilts.

Version-5 (fig. 3.e) relates versions 4 and 6. The only difference to version 4 is that the service wing is aligned to the entry. The rest of volumes coincide in both schemes (4 and 6), except for the sunken courtyard next to the entrance approach.

Version-6 - FINAL PROPOSAL (fig. 3.f) was also to be finished in concrete and glass. The chimney was attached to the wall of the garden terrace; the main living room is closed off with glass walls. Like versions 2, 3, 4, and 5 the living-room garden is only accessed through the living areas.23

![Image]

Fig. 4. TABLE: FORMAL DESIGN ELEMENTS

Mies had to use aerial views to visualize the formal design features (fig. 4).24 The main changes occurred on the entrance, living-room garden and garden terrace because these open-air areas interconnect public and private realms of the house. Volumes played an important role in the conception because each one represents a main zone of the house.25 The living room was always at southeast (a 14 x 7m prism) the service wing at northwest, and the entry on the center of the composition.

The above formal features were also crucial to clarify the flow of ideas from one stage to another. Version 1 develops the horizontal expression of volumes against the verticality chimneys. In Version 2 the expansion of natural places is relevant, so that the living-room garden is partially inserted below the cantilever second floor volume. Version 3 remarks the public-private sense of exterior areas through a solid entrance wall dividing entrance from living-room garden. Version 4 is focused on the free access from the street to the backyard, and the definition of the service volume. Version 5 remarks the entrance between a sunken court on one side and a high fence on the other. Compared to version 1, Mies concluded his process with a rather modest proposal without exaggerated spread volumes but he kept the horizontal sense that would harmonize with the surrounding landscape (version 6).

IV. Analysis and Characteristics of Mies’s Perspective Drawings

Freehand perspective sketches were frequently used in Mies’s office; some were presentation drawings and others were communication data during the design process. We have analyzed both because they clarify the design characteristics of Mies, and reveal the ideas behind graphics. The results are the following:

a) In some drawings, the spatial idea is relevant over any specific element of the composition. In these cases, perspectives are explanations of concepts instead of being the representation of objects (fig. 5, view 1).

b) The views are placed in a horizontal frame. This produce a focus angle relatively wide compared to the human eye. Some researchers have defined this feature as “the way in which the horizon line defines the space”.26 The three-dimensional reconstructed views confirm this hypothesis because the focus of the computer camera had to be wider to get an angle similar to the original drawing (fig. 5, view 1, RV1). The angular measure drawn over the original plans determine the visual angle of Mies’s sketches (right column on fig. 5).

c) The views were rendered remarking “the sense of deep”.27 The distance between the observer and the space elements is larger than the actual focus of the eye. We had to exaggerate the focus depth of the computer camera in order to visualize a similar view to the original sketch of Mies, so that the depth of the living room became inevitably unreal in our CAD reconstruction (fig. 5, view 3, RV3). We think that Mies was intensifying the depth of the view to show the broad effect of the glass living room.

d) The removing of elements that obstructs the visibility of important spaces was a useful resource in Mies’s drawings. In View 2 Mies omitted the staircase next to the dining room (right hand side of the sheet) in order to continue the view from the living-room garden to the backyard. Note that in our CAD reconstruction the staircase is inevitably projected and is partially covering the view through the house (fig. 5, RV2).

e) Mies also manipulated the free location of the standpoint. In fig.5, RV4 we had to place the standpoint of the CAD reconstruction within the house, contrary to the original sketch’s
one, which Mies located outside (fig. 5, SP4). Note that in Mies’s sketch he drew the outside wall in plan in order to see the interior, so that in RV4 we had to enter the house to make a CAD reconstruction equal to the original. This suggests that Mies’s standpoint location was following his visionary ideas instead of the actual condition of the planning.

f) The graphic confrontation between Nature and house render the drawing with dynamism and balance where no hierarchies prevail but a careful position of all spatial elements (fig. 5, view 3).28

g) Our CAD reconstruction simulate the reduction of space to lines and volumes (fig.5 RV2); as Mies would never suggest to his client this cold effect of technical drawings, we now can understand why his freehand sketches are represented with plants, furniture, and textures (fig. 5, view 2).29

h) Mies used to study architectural elements from different viewpoints at the same time. The staircase on fig. 5 view 4 was drawn in plan and three-dimensional views in the same sheet. This threefold representation was useful in Mies’s office to decide the right orientation and the impact of architectural elements upon the surrounding spaces.30

i) The element under study in Mies’s perspectives is placed on the center of the viewpoint remarked with a thicker line defining its borders. Hence, the reading of the drawing starts from the center of the view and from background to foreground (fig. 5, view 4).

j) Presentation drawings framed the house with the surrounding foliage (fig. 5, views 1, 2, 3). If we compare them to the reconstructed CAD views (RV2, RV2, RV3) we found that usual hard-line drawings omit the natural sense of space, so that we could now see the importance of Nature in Mies’s renderings.

The above results confirm that Mies avoided technical hard-line presentation drawings because of the short time schedule of the competition, and maybe, because he was exploring the philosophical idea on the integration of Man, Architecture, and Nature.31

<table>
<thead>
<tr>
<th>View 1</th>
<th>View 2</th>
<th>View 3</th>
<th>View 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="source1" alt="Original Drawing" /></td>
<td><img src="source2" alt="Reconstructed View" /></td>
<td><img src="source3" alt="Reconstructed View" /></td>
<td><img src="source4" alt="Reconstructed View" /></td>
</tr>
<tr>
<td><img src="source5" alt="Reconstructed View" /></td>
<td><img src="source6" alt="Reconstructed View" /></td>
<td><img src="source7" alt="Reconstructed View" /></td>
<td><img src="source8" alt="Reconstructed View" /></td>
</tr>
<tr>
<td><img src="source9" alt="Reconstructed View" /></td>
<td><img src="source10" alt="Reconstructed View" /></td>
<td><img src="source11" alt="Reconstructed View" /></td>
<td><img src="source12" alt="Reconstructed View" /></td>
</tr>
<tr>
<td><img src="source13" alt="Reconstructed View" /></td>
<td><img src="source14" alt="Reconstructed View" /></td>
<td><img src="source15" alt="Reconstructed View" /></td>
<td><img src="source16" alt="Reconstructed View" /></td>
</tr>
</tbody>
</table>

**NOTE**
- This symbol refers the perspective viewpoint, angle and axis of the view (on the plan).

**LEGEND**
- RV | reconstructed view
- SP | standpoint

---

(365)
V. Conclusion

The present research studied the aerial views and perspective drawings of Mies van der Rohe’s Gerick House (1932) through their three-dimensional CAD reconstruction in order to clarify the characteristics of Mies’s design process. As the Mies van der Rohe Archive or any previous researchers have not organized the design process’s drawings of Mies, this research is the first attempt to compose a sequence of design of the six important aerial views. As result, we have found that Mies interconnected public and private realms through the design of the entrance, the living-room garden and the garden terrace. The analysis of four perspective views clarified the following characteristics: the relevance of horizontal frame, the insistence on a deep visual focus, the deliberate omission of spatial elements that obstruct any ideal vista, and the free location of the standpoint according to the subject of the view. Previous researchers have not studied carefully these matters, and none have applied the advantages of CAD models to prove their hypothesis. We take this challenge here, and went further to prove that our method could be useful for a better understanding of Mies’s architectural design.

Although this research has concluded the analysis on Gerick House, we are also studying three additional cases (Mountain House, Hubbe House, and Court-houses) that will clarify other characteristics of Mies’s design process of early 1930’s houses.

Acknowledgements

This study is part of the results of the investigation work promoted by the research grant 12-102 of the year 2000 of the Foundation for Ergodesign Culture. We are also indebted to Prof. Dr. Eng. Fritz Neumeyer (Berlin Technical University), and Dr. Christian Wohlfarth (Bauhaus Archive, Berlin) for their advice were involved during the production of this paper.

Notes and References

11) This research uses Mies’s terms on the House. See Tegeloff, op. cit. p.115
12) According to the client’s program, these areas had to be mainly considered. Ibid. for a detailed description of the house see Tegeloff, op. cit. pp. 115, 116.
14) This research presents for the first time the aerial view of the final proposal. The existence of the original perspective is unknown, but it is possible that Mies has visualized its overall form either in an aerial view or in a study model.
15) As the Mies van der Rohe Archive and previous researches on Gerick House do not provide any design sequence, we have organized the present one through the formal features of the aerial views. The actual sequence of Mies is unknown because he never clarified the design process steps. Therefore, this research is the first attempt in the history of this house to create a logical design sequence.
16) Except for the final proposal that was reproduced from the floor plans published in the Archive. See The Mies van der Rohe Archive, op. cit. pp. 327-328.
17) These dimensions are stated in the Gerick House program. See Tegeloff, op. cit. p.115.
18) There is no written document that explains Mies’s design process’ ideas.
19) A house with a remarkable difference between the closed rooms on upper level against the open living areas on lower level (at Tungendhat House).
20) The objects remarking views’ borders determined the angle and position of the viewpoint.
21) Mies was comfortable using brick and glass from mid 1929’s.
22) Mies designed the living-room garden as a natural barrier between the noise of the street and the tranquility of the dwelling. Tegeloff, op. cit. p.116.
23) It is possible that Mies worked aerial views and working models at the same time, although there is no evidence that could prove this.
24) Mies first worked on modern zoning-plans in the Concrete Country House.
26) See Franz Shulze, op. cit. p. 194. He explained that during the 1930’s, Mies often did perspectives as ‘almost telescoped space’.
27) Wolf Tegeloff explains the importance of Nature among Mies’s sketches on the beginning of the 1980’s, op. cit. p.116. And Richard Pommer has also noted that this feature started around 1930’s op. cit. p. 112.
28) Unlike his studio drawings that only represent lines and shapes, or his abstract American Court-houses collages.
29) This kind of sketch was also used in the Tungendhat House drawings.
30) Mies studied this concept since c.1918 through reading Paul H. Fronne, but only after 1925 that he gave architectural shape to it. Neumeyer, op. cit. p.104.
31) Both analysis are complementary, so that one explain the outward formal features whereas the other reveals the structure of the interior space image.

和文要約

本論文はミース・ファン・デル・ローヘが1930年代に行った住宅建築の設計案についてその設計過程を分析し、ミースの設計手法における特性を明らかにしようとする一連の研究のうち、グリッケ邸（1932年）の設計過程におけるスケッチを、CADを用いて三次元復元の新しい分析方法を試みつつ、設計方法と設計内容を解明しようとするものである。

スケッチは鳥瞰図とアイレベル透视図に分類でき、CADを用いて輪郭投影図と透视図として出力し、原透视図と比較した。設計過程は6段階に分類整理することができた。そこでは玄関、居間、庭の間の領域処理を通じての内外空間の融合といったミース独自の手法が的確に確認できた。また4つの透视図の分析を通じて、水平に広がる規則の眺望を好んだこと、深い奥行方向の見通しを強調して表現すること、理想的な眺望を阻む空間要素を省略して表現すること、視点位置を自由に設定して現実にはない眺望も描いていたこと、といった特徴を観出ることができた。

以上のような特徴はこれまであまり扱われなかったミースの独自の設計手法を明らかにするものであり、またCADによる三次元データ化、透视図作成を通じての多様な画像作成と原透视図の詳細な比較分析を通じて初めて明確化することができるものであって、本研究の研究方法論での成果である。