

# THE SCHOOL OF ARCHITECTS AND ENGINEERS: MIES, KORNACKER, AND THEIR FOLLOWERS

## **Abstract**

From the times of the first Chicago school of architecture, architects and engineers collaborated in Chicago, forming teams, often in pairs, in order to respond to the needs of their time, developing the structural typology of high-rise buildings, and characterizing them with their own expressions. Continuing this legacy, Ludwig Mies van der Rohe coined the term “structural architecture,” and collaborated with the engineer Frank J. Kornacker. The duo and their term eventually epitomized the rise of a new school, which in turn left its legacy in the city and abroad.<sup>1</sup>

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Figure 1: South Elevation, Graham Resource Center, Illinois Institute of Technology. (Source: J. C. Brownson, Master's thesis, IIT, 1954.)

## 1. The Collaboration Between Mies and Kornacker

"An architectural curriculum is a means of training and education. It is not an end in itself. A curriculum without a philosophy is not broad and wide, not even neutral, but at the Illinois Institute we are concerned, among other things, with the idea of structure, structure as an architectural concept."<sup>2</sup>

All of the ideas that Mies used to create the new curriculum reached their maximum expression in the graduate program. Mies and Kornacker collaborated in order to instill this philosophy of "Structural Architecture" in their graduate students, who worked on the design of a complete architectural project as a final master's degree thesis. Mies and Kornacker supervised five theses that proposed architectural solutions in which the structural component was the protagonist, creating open spaces: Two of them used unidirectional structures, while the other three used structures in two directions.

Jacques Brownson presented his own house for his master's degree thesis, with the aim of exploring the possibilities offered by the new industrial materials in the design of domestic projects. Brownson proposed a continuous space without any interior supports, meaning that it could be subdivided in any way. The structural system consisted of four rigid frames from which the roof was suspended. Having chosen the structural system, the subsequent decision-making process was based on the laws of proportion (figures 1 and 2). Peter Roesch proposed a structure without intermediate supports, which he considered as ideal for the design of a non-denominational church. Due to the dimensions being considered for this purpose, he proposed a large space comprised of two longitudinal trusses over perimeter supports, from which the roof was suspended (figure 3).

### Notes

1. "The [Promontory Apartments] building launched Mies on a career that was literally to transform the skyline of Chicago and to inaugurate what the editors of *Architectural Forum* were to call the Second Chicago School of Architecture." Condit, 1930-1970: *Building, Planning and Urban Technology*, 52-54.

2. Mies van der Rohe in "Second Session: Illinois Institute of Technology," 14.



Figure 2: East Elevation, Graham Resource Center, Illinois Institute of Technology. (Source: J. C. Brownson, Master's thesis, IIT, 1954.)

The most widely-publicized thesis that Mies and Kornacker tutored was the proposed design by Yujiro Miwa, Henry Kanazawa, and Pao Chi-Chang for a Convention Hall, which was developed in Mies' studio at the same time as one of his own projects (figure 4). Harvey Stubsjeon mentions how a long-span structure is more suitable for the requirements of a community center because it allows for the maximum flexibility with the smallest perimeter, at the same time as lacking any defined directionality. The structural system that was chosen to resolve a span without any interior supports was a square grid. Perspectives were created to study several options, as the final solution is always based on visual considerations (figure 5). Another of the final theses tutored by Mies, in collaboration with Kornacker as a structural consultant, was Peter Carter's project for an Art Museum. In order to resolve the structural system, Carter tested three different structural systems. The first two solutions were ruled out as they had a marked direction, considered as being unsuitable for resolving a square ground plan. The selected option consisted of a grid of bidirectional girders supported on eight perimeter columns. The preliminary requirements proposed by the student were therefore resolved with "a clear structure of well-proportioned elements in which part relates to part, and all parts to the whole" (figure 6).<sup>3</sup>

## 2. The Legacy

Myron Goldsmith brought the concept of 'Structural Architecture' to prominence, continuing Mies' work on the graduate program of the IIT, after he retired in 1959. Goldsmith and David Sharpe worked together with structural engineers in order to continue instilling this idea in students of architecture. It was first Fazlur Khan, and then Mahjoub Elnimeiri, who helped the students to solve structural problems in the same way as Kornacker had previously.

"Chicago is an exceptional city where clear but rational expression of the structural system is expressed to the full advantage and quality of overall architecture. It is this visible expression of technology in architecture that distinguished the Chicago School from all others and it is this particular quality and strength that has made Chicago a unique historical source of contemporary architecture."<sup>4</sup>

3. Carter, "An Art Museum," 13.

4. Khan, "Technology in Architecture—The Chicago School."

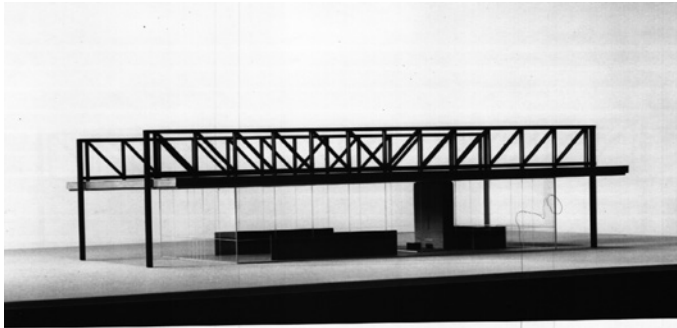


Figure 12. Perspective of proposed solution

Figure 3: Perspective of Proposed Solution, Graham Resource Center, Illinois Institute of Technology. (Source: P. Roesch, Master's thesis, IIT, 1956.)

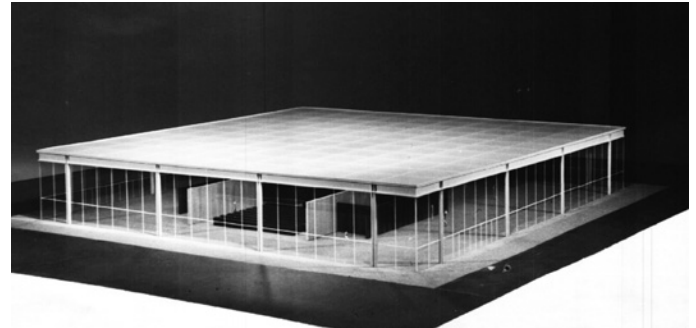


Fig.23. - Photograph - Final Model

Figure 4: Final Model [T S932], University Archives and Special Collections, Paul V. Galvin Library, Illinois Institute of Technology. (Source: H. D. Stubsjeon, Master's thesis, IIT, 1954.)

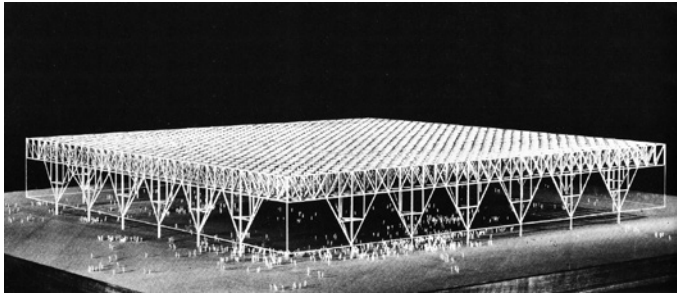


Figure 5: Perspective of Structural System, Graham Resource Center, Illinois Institute of Technology. (Source: J. Miwa, H. Kanazawa, and P. Chi Chang, Master's thesis, IIT, 1954.)

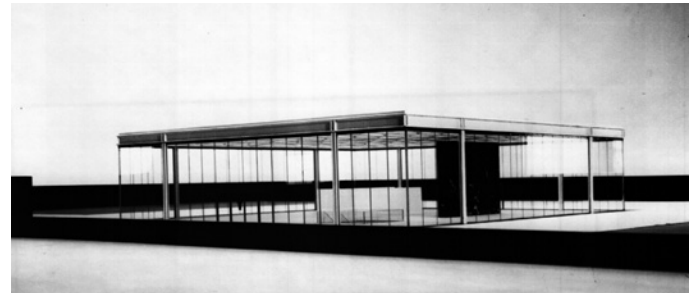


Figure 6: Exterior View of Model, Graham Resource Center, Illinois Institute of Technology. (Source: P. Carter, Master's thesis, IIT, 1958.)

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