Universal Space, International Style: Mies van der Rohe's Bacardi Building and His Clear Span Philosophy

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INTRODUCTION

Mies van der Rohe's architectural work following his move to Chicago in 1937, has traditionally been seen as an extension of his earlier exercises in the synthesis of structure and space. This synthesis is often traced from its genesis in the 1929 Barcelona Pavilion and the 1923 Brick Country House project through a series of residential works in the 1930s, and culminating in the large-scale structural grids of 860-880 Lake Shore Drive and the Seagram Building of 1949 and 1958. However, contemporaneous to these later works, a series of long-span buildings by Mies presented a more ambiguous postulation regarding the integration of program, structure, and architectural space. Sharing its origin with the frame-type in the Barcelona Pavilion, the clear-span theme in Mies' work includes Crown Hall, the National Theatre project in Mannheim, the proposed Chicago Convention Hall of 1953, and the Bacardi Building project in Cuba. This last example represented a re-consideration on Mies' part of the formal, material, and ontological consequences of the 'universal space.' More than simply an expedient way of subordinating programmatic requirements to the desire for a pure volume, Bacardi and its architectural heirs proposed not only a dialogue between support and extension, but also one between universal space and particular place. Relying on the climate of the site and a developing philosophy of structural expression, Bacardi suggested a synthesis of these themes and a strategy for expressing both structural and formal particulars, as well as relationships between the corporeal ground of construction and the ethereal grid of abstract, modern space.

THE LONG SPAN IN MIES' WORK

The project for the Bacardi headquarters in Santiago de Cuba occupied Mies for much of 1957 and 1958, prior to its demise in the wake of the Revolution.[1] Despite its short duration and unfortunate timing, however, the project fundamentally altered the direction of Mies' clear-span philosophy. Arguably, Mies' first proposal involving a long-span space as a major architectural element was the 1929 German Pavilion at Barcelona, a project that encoded a parallel constructed philosophy to that of his high-rise projects. At Barcelona, the primary architectural experience is one of vertical compression and horizontal expansion. This expansion is modulated by a series of planar elements detailed to appear as if they are suspended between the floor and ceiling planes-no hint is made of either horizontal plane altering its configuration to accept the partitions that divide the space within. Given Mies' preoccupation with the role of industrialization and structure, the Barcelona Pavilion is in fact underdetailed, emphasizing the spatial notations of its planar elements rather than its fabricational process or structural performance. Individual partition walls play the same role spatially as the Kolbe sculpture of a dancer, while the stainless steel columnation is formed of bilaterally symmetrical cross forms suggesting a neutral grid against which the local directionality of the Pavilion's spaces may be read. There is thus already a tension between universal space and contingent place in that the 'defined' yet 'unconfined' borders of the Pavilion's volume suggest a particularly strong manifestation of human scale in an otherwise undifferentiated milieu. Mies elaborated this idea of a universally functional space versus particular place in his 1943 project "Museum for a Small City," in which artwork was to be displayed against a transparent building envelope, with views of the exterior landscape forming their backdrop.[2]

Similar experiential ideals can be found in Mies' clear span works of the 1940s and 1950s, particularly in the Farnsworth House and at Crown Hall. In each of these structures an infinitesimally delineated glass volume is suspended between floor and ceiling planes, again detailed to suggest geometric

purity and disregard for gravity or static form. Within, functions take place within defined, rather than confined, areas, and the internal elevations are formed by the exterior backdrop – the flood plain vegetation of the Fox River in one case, the surrounding buildings of IIT in the other. There is thus an ambiguity between the universal, limitless and flexible space within, and a paradoxically monumental definition of place from without. If the interior of the Farnsworth house suggests an ultimate transparency, a one-ness with the outdoors, its exterior and that of Crown Hall both suggest the sanctification of a particular location through raised entry sequences, complex symmetrical relationships, and minimal detailing of glass skins. Indeed, in both cases we may read these exteriors as structural support systems for transcendental glass volumes, while the interior experiences may be read as extensions of limitless possibility to the world beyond.

While Mies' preoccupation with crystalline volumes would inform his high-rise work after 1950, his interest in expressive clear span structures with regard to both space and place suggests a parallel exercise in the proper relationships between support, function, and presence, beginning with the so-called 'Concert Hall Collage' of 1942. In this project, perspectivally cut planes of color and materials formed a theatrical space within a clear span articulated by structural trusswork-in fact a photo of an factory by Albert Kahn. While this exercise is often seen in relation to Crown Hall, there are important suggestions here that would not come to fruition until the mid-1950s.

Primarily, the Concert Hall Collage contains a suggestion of two dialectically defined classes of space within a single volume. Whereas functional and anthropomorphic space had been solely defined by vertical planar elements in the Barcelona Pavilion, the Farnsworth House, and Crown Hall, with the 1942 collage we see for the first time a larger-scale definition of universal space in terms of an overhead structural module. In the previous examples, structure had been articulated in the forms of columns whose positions within spatial compositions were either equivalent to the vertical planes (Barcelona) or excluded from the glazed precinct altogether to demonstrate its support role for the privileged volume within (Crown Hall). However in the Collage Mies suggested a reversal of this interpretation. This occurs on a functional level in that the 'structure' of the Concert Hall occurs within the enclosure rather than on its exterior. However, there is also a conceptual reversal here-the definition of the 'universal space' is achieved by the plane of structural trusswork above, continuing past the vertical partitions to an infinite vanishing point, while the contingent definition of localized function is achieved by free-floating, atectonic planes. Whereas the Farnsworth House suggested a place-defining structure supporting a universally flexible volume of space within, the Collage suggests precisely the opposite-a universal space defined by an apparently infinite structure with the demarcation of a specific place through arbitrary wall and ceiling planes.

The so-called 50 × 50 house further explored this conceptual inversion. This house, a 1951 project for real estate promoter Robert McCormick, consisted of a glass volume held precisely at the demise lines of an overhead structural grid. While the interior pavilions and furniture of the House appear to replicate the arrangement of the Farnsworth House, the purity of the glass skin and the overhead structure suggest a new direction. Most noticeably, the overhead structural plane was not supported along its lengths – the structural scheme of Farnsworth – but only at the center points of each side. The roof slab would thus have acted as a diamond shaped set of primary structural elements, with the four corners acting as cantilevers. Emphasizing the drama of the cantilevers, the glass skin was to have no subframes whatsoever, even in the corners where the panes were to have been butt-jointed. The house thus rejected the classical dictum that solid bays should not occupy the center of an elevation in the strongest sense possible, while suggesting a crystalline reaction to the more commonly noted Schinkelesque corners in other Mies buildings.

Paradoxically, photographs of the 50 × 50 House model show a rectilinear structural grid expressed on the interior rather than the structurally correct diagonal. This is the first structurally articulate overhead plane in Mies' work since the 1922 Concrete Office Building project, save for the Concert Hall Collage, and while the grid does not reflect the structural performance of the overall scheme, it does suggest a ceiling relating to and expressing the structure. Largely executed by Myron Goldsmith, the genesis of the egg-crate system reveals an example of Mies' ambivalence toward structurally determinant form. While a sketch by Goldsmith shows a diagonal grid – structurally 'correct' in that the axes of the members would have been aligned to carry the cantilever loads to the columns efficiently – it is apparent that Mies rejected the diagonal organization in favor of a scheme relating to the spatial organization below.[3]

If its structural grammar was dubious, the 50 × 50 house was nevertheless Mies' strongest statement yet of an architectural volume as a functionally and experientially defined segment of a suggested universal space. Both Crown Hall and the Farnsworth House are inextricably rooted to their specific place by acknowledgement of the ground conditions and by carefully delineated directionalities. With the 50 × 50 House, Mies proposed a sort of architectural place-lessness, in that the house appears to rest lightly on a random piece of earth: it is neither placed on a podium nor set into the ground as a crystalline monument. The unbroken glass expanse, particularly at the corners, suggests that this house has been carved out of an otherwise unbroken grid extending infinitely in all four directions. A proposed series of partitions within implied an infinite variety of placements within the overall framework of the House and by implication throughout an infinite grid of space.

Shortly after the abandonment of the 50 × 50 House project in 1952, Mies was engaged by a Chicago planning agency to propose a design for the Chicago Convention Hall. There are similarities between these two projects, in their extreme horizontal delineation between structure and space, open corners, and freely conceived major volumes with suggestions of flexibility, mobile partitions, etc.[4] However, the Convention Hall does not share the House's feeling of universal extension into the landscape. Whereas the earlier clear-span examples suggest cages of structure carving out or delineating crystalline portions of infinite space, the Convention Center defines – or rather, actually *confines* – an interior place abruptly. Instead of being supported by fingers of structure, the skin of the overhead plane turns down at the Hall's edges, forming not only a ceiling but also four surrounding walls. This effect is intensified by the proposed cladding (either aluminum or marble) and the site plan, which compared to IIT is almost beaux-arts in its emphasis on the symmetrical Hall. Indeed, the rejected suggestion of the unclad structural models – which do suggest visual continuity with the surroundings – implies that Mies' choice of a solid cladding was quite intentional. The separation of this monumental void from the rest of the universal grid was apparently to be of primary civic, not to mention ontological, significance in defining not only a functional space, but also an urban precinct.

It is thus no coincidence that the Convention Hall project also marks the beginning of a dialogue between earth and sky in Mies' long span work. The point supports at the edges of the Hall volume, where the combined lateral and gravity structures terminate and rest on a series of massive conical supports, imply that the entire volume has been placed on a series of conscientiously prepared earthworks. These supports are the only elements to break the vertical planes of the volume above, and likewise they share neither the diagonal grid geometries of the major structure nor their lightweight construction. This is different from the Farnsworth House, for example, where the I-beams that support the roof connect directly to the ground below. Likewise, if the 50 × 50 House appears to have been placed at once in the landscape by an unseen hand, the Convention Hall appears to have landed upon a separately executed modification of the ground. The Convention Hall is likewise Mies' first major project to suggest a floor surface sculpted from the earth-in this case to form the perimeter Hall seating. If the geometry of the Hall volume continues the idea of an infinite three-dimensional space-albeit folded here to define a specific volume-the columnar supports and the interior earthwork are hints of a specific piece of land being altered to denote a unique place. For the first time in Mies' work, the Convention Hall combines the sensation of infinity found in the 50 × 50 House with the corporeal connections of the Brick Country House's finite walls and hearth, a dialogue between the primary conditions of bearing and spanning, earth and sky.

Notable too in the Convention Hall project is the use, for the first time in Mies' career, of structural pin joints to connect large building elements. Previous work at all scales, including 860-880, Crown Hall, and the Farnsworth House, had relied on moment connections between steel and/or concrete members to achieve monolithic structural performance. Visually, these moment connections suggest monumental building volumes, as they do not lend themselves to meaningful structural articulation. Rather, a moment connection in steel requires continuing flange edges from each member through a shared volume, while one in concrete is achieved by increased structural depth or greater reinforcement. At the Convention Hall, the large spans dictated the use of pin connections primarily for thermal expansion: moment connections would have placed severe rotational stress on the foundations, while pin connections eliminated any bending forces exerted by the overhead structure's movement. Visually, these pin connections carried the logic of the triangulated wall structures to a definite conclusion, an interface of miniscule proportions between the lightweight spanning structure and the heavy earth-bound foundations. Both of these systems anticipated this interaction, and their forms reflected an inflection to accept the other visually and structurally. The monolithic qualities of the earlier works-which seem ambiguously placed between ground and sky-are here replaced by an articulate proposition involving carefully presented bearing and spanning elements, brought together at details carrying with them the physical and metaphysical weights of such a demarcation.

THE BACARDI PROJECT IN THE CONTEXT OF MIES' LONG SPAN WORKS

In March 1957, Bacardi Liquors president Jose Bosch visited Mies' office after seeing a photograph of Crown Hall in an issue of *Life* magazine. Bacardi was in the process of selecting an architect for a new headquarters building in Santiago, Cuba, and the idea of the open plan appealed to Bosch as a management philosophy.[5] Mies and project architect Gene Summers arranged a trip to Havana in April, where they sketched out the essence of a new structural typology in Mies' work. Bacardi would become a clear span exercise that extended the logic of earlier works while realizing a new *relationship* between the overhead structure and its earth-bound foundations.

According to Summers, Mies at first took Bosch literally: suggesting a replication of Crown Hall's precisely delineated crystalline volume on the site. However, Summers noted that the environmental realities of the new site would preclude any idea of directly replicating Crown Hall's tectonic:

> "*. . . I said, 'Mies, you just can't do that. Here we are in Cuba, and the salt air will absolutely kill the building in three years, and the glass is on the outside and the sun is going to bake the people inside like this.*"[6]

Noting the immediate surroundings of their courtyard hotel in Havana, Mies and Summers incorporated the idea of a large, overhanging roof to shade the glass volume, pulling the environmental enclosure in from the edge of the roof by about six meters. The corrosive effects of the salt air led them to a structural grid of prestressed concrete rather than steel. From sketches included in the *Mies in America* exhibition, this entire conversation occurred the evening of April 6th, concluding with a sketch in which a prestressed concrete grid covered a 50 meter by 75 meter area, supported at 5 meter intervals on all sides.[7] The corners on this scheme were cantilevered by one bay, and the overall elevation appeared like a re-interpretation of Crown Hall in concrete, with a regular structural grid subdivided by a mullion system and acting in concert with the roof slab as a two-dimensional portal frame. However, the fundamental change in the relationship between the glass volume and the surrounding structure, brought about by Summers' concerns regarding solar gain, introduced corner cantilevers and (un-noted on Summers' sketch) an elevational emphasis on the columnar screen.

It is this last effect that Mies rejected, comparing it with the contemporary U.S. embassy in Greece by Walter Gropius.[8] The next night, returning to the Hotel Nacional, Summers and Mies sketched an alternate solution, one in which the columnar screen was condensed to form a pair of more monumental piers on each side. Rather than occurring outside the line of the roof beam, the piers were placed within the roofline, eliminating what had been an awkward relationship between column and roof in the previous night's scheme. The piers were sharply tapered to provide a stable footprint at the base and a narrow top, representing the moment connection at the ground and the point support condition at the roof. The glass volume within now read as an independent volume on the elevation, whereas in the columnar scheme it had aligned with the penultimate column on each side. The resulting composition separated bearing structure, spanning structure and enclosure, reading now as a vitreous box within a more robust frame.

Further sketches executed that evening reveal that Summers and Mies recognized an ambiguity in their conception. One sketch in particular points out the structural contradictions inherent in the Bacardi-type span. It shows two static conditions – one beam simply supported at its ends, and another supported at approximately its third points. The diagrams show the deflections of the beams under these two conditions and suggest the magnitude of the bending force in each beam due to its own weight or a consistent roof load. In the first, simply supported instance, the pin connections at either end ensure zero bending moments at those points, with the maximum moment and deflection occurring at mid-span. The second case is, however, more complicated. As the supports are pulled inward, the weight of the cantilevered ends of the beam cancels out the moment caused by the weight of the center portion. While the maximum moment thus occurs over the two supports, the maximum *deflection* occurs at either the center of the middle span, or at the ends of the beam. In terms of structural configuration, this suggests two distinct beam conditions – the simply supported beam will tend to require greater structural depth in the middle of the span, while the cantilevered beam will require its greatest depth over the supports themselves.

As conceived by Summers and Mies, the Bacardi type contains both situations. By maintaining the 50 × 50 House idea of structure held to the perimeter, the edge beams in the Bacardi project functioned as cantilevered beams. The efficiency of this layout's balanced weights allowed it to be configured as a simple rectangular element – the high moment over the support would not govern the beam's shape as strongly as the shear condition, and thus no change in section was necessary. However, the beams spanning the main space were to be supported at the ends only, by the edge beams themselves. They therefore carried a greater moment at the center of their span. Later work by Cuban structural engineers Saenz, Cancio, and Martin, as well as Chicago engineer Frank Kornacker, showed that the moments in these beams were significant enough to require greater structural depth over the middle of the space.[9] Rather than express this modification in the structural grid, Mies proposed covering the entire structural grid on the interior with a dropped ceiling. The infinitely extendible grid proposed by the 50 × 50 House here ran against limitations brought about by the increased scale of the Bacardi project. As the manifestation of the grid increased in size, the structural system came under physical pressure to alter its form, creating a specific suggestion of centrality. The ceiling plane here suggests Mies' attempt to deny this emphasis spatially, just as the ceiling plane at Crown Hall can be seen as a visual denial of that structure's directionality.

By the end of 1957, Mies' office had prepared presentation drawings and a model showing a refinement of the original scheme, a glass-walled square pavilion surmounted by an overhanging prestressed concrete roof and supported by eight piers at the perimeter of the roof slab. The pavilion's relationship to the ground was clarified with the provision of a low podium and external stairs, while the interior was developed as a suprematist plan with asymmetrically placed stairs, partitions, and cores – a notable contrast to the classical spirit of Crown Hall and the Convention Center.[10] The detailing of the piers and edge beams demonstrates Mies' desire to express the constructional and structural forces at work in the scheme as integral with its spatial sensibility – however contrived. Each of the concrete piers was tapered from the ground to the top, with a sharp change in angle at the capital that visually ended the pier while wicking water away from the piers' top surfaces. Steel rocker joints made visually precise connections between the piers and the edge beams. The two-way roof system was detailed to communicate the position of the long-span elements behind the edge beam, with narrow rectangles protruding from

that beams surface to broadcast the dimensions beyond. These panels were required to conceal the ends of prestressing cables within, yet they alluded to the bi-directional system of the whole. They also delineated a classical proportioning system in that each pair of piers divided the elevations into cantilevered bays of five modules, and a center bay of eight – sequential numbers in the Fibonacci series and a coarse approximation of the 1.618/1 golden ratio.

Beneath this hovering roof form, the glass enclosure was precisely inserted between floor and ceiling, similar in spirit to the lobby volume of 860-880. It met the overhead grid two modules in from the edge beam, continuing the Fibonacci sequence. The glass bays, each three meters wide by seven meters tall, were subdivided into a lower zone containing doors, and an upper zone containing five-meter high panels. As in Mies' other long span works, utilities and spatial division were accommodated by low walls and rectilinear objects within the space. Crucially, there were no cores shown in the model, suggesting that air conditioning and lighting may have been planned from below. If so, this would have obviated the need for the suspended ceiling, which would have thus functioned as a resolutely visual component, doing nothing but suggesting a pure universal space and concealing the nature of the two-way structure above.

It is notable in the history of Bacardi that an obvious structural improvement to this arrangement was never considered, despite an apparent precedent. In 1957, Skidmore, Owings, and Merrill completed design work on the United States Air Force Academy in Colorado Springs, CO. The Dining Hall in this complex, designed by Gertrude Lempp Kerbis, was conceived and built as a 100 meter square roof plane supported on sixteen steel columns. These columns were set back not only from the corners, but from the roof edges themselves. Thus, fourteen percent of the Dining Hall span was cantilevered; balancing the maximum load in the center and enabling an overall thinner truss than would have been possible with a simply-supported system.[1] The Hall made the anti-Miesian move of placing the column supports within the void spaces of the frame above, supporting the top chords of the frame by an inverted pyramid of steel angles atop each column, and notably hiding the rocker joint behind a fascia.

Despite this radically different aesthetic sensibility, the cantilevered solution seems such an obvious structural improvement over the simply supported scheme that it begs the question of why it was not considered by Mies for Bacardi. It would have eliminated the problem of the deep simple spans, and could have integrated the piers with the window wall – Bacardi is his first suggestion of a completely pure glass volume uninterrupted by a structural cage. Part of the answer may be strictly elevational, in that breaking the elevational plane would have diminished the strength of the Fibonacci proportioning system. Summers has additionally suggested that Mies found large cantilevers too "dramatic," and it seems possible that the drama of a six meter overhang may have put too much emphasis on structural expression at the expense of seeing the volumetric delineation of the pavilion from inside.

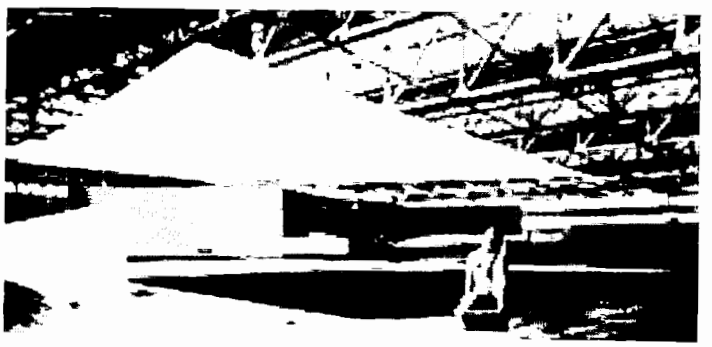
There is, however, an alternate explanation for Mies' preference. If certain elements of the Bacardi scheme continue the idea of a universal space, others suggest that this idea was seen only as a dialectical partner to the creation of very well-defined place, continuing Mies' often silent concern for the particular in dialogue with the universal. This occurs in his almost Wrightian Brick Country House Project, in the material manifestation of the 'universal' in the individually crafted and carefully located Barcelona Pavilion, and even in the Schinkel-esque formality of Crown Hall, among others. In each case, the provision of a rhetorical infinite space acts to intensify the contingencies of the individual site. Even the 50 × 50 House and the Convention Center, while hardly site-specific, nevertheless proposed engagement with the ground plane and deferred to the particular piece of space in question. The House achieves this with a hearth whose disconnection from the overhead plane emphasizes its binding to the ground, the Convention Center by the spanning structure's apparent alightment upon a prepared set of earthworks.

At Bacardi, the piers can be read as a suggestion of just such a preparation in tandem with the podium and steps. All of these suggest a sculpting of the site to receive an architectural demarcation of infinite, mathematical space. Unlike the Convention Hall, where this reading was confused by the 'turning' of the structure down into walls, the overhead plane at Bacardi was rendered as a precise plane dropped onto the earthwork piers as tenuously as possible to lend horizontal extension to the corporeal site. To bury the piers deep within the overall structure would have been 'too dramatic' in that it would have suppressed the reading of the earth-bound elements, emphasizing instead the sublime overhead cantilever. Caught between these two systems – earthwork and skyplane, bearing and spanning, monumental and undifferentiated, the crystal vitrine of the glass wall would have negotiated between the two systems. That this wall was meant to contain the complex' primary human activities suggests that the Miesian standard of freely formed wall and plan surfaces occurring between two horizontal planes may have somewhat more ontological significance than is often assumed. At Santiago, recognition of the unique climatalogical properties of the particular site shaped a delineation of 'universal space' that nevertheless suggested a dialogue between earth and sky, particular and infinite. Rendered in concrete, the earth of Cuba would have reached to the heavens, to be rewarded by a precipitate of infinite space configuring eight of it's points to rest on the piers below. This dialogue of mathematics and material was for Mies the drama worth accurately portraying, rather than the cold physics of the static performance within.

ILLUSTRATIONS

1. Edith Farnsworth House. Plano, IL. Mies van der Rohe, 1950

Mies' clear span ideal in embryonic form. The directionality of the house volume, and its sanctification via a raised entry sequence, belie claims of a 'universal space. At the same time, there is no acknowledged relationship to the ground structurally – the I-beam columns continue uninflected past the ground line.



2. Concert Hall Collage. Mies van der Rohe et al, *ca. 1942*

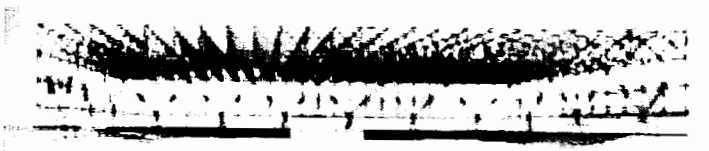
An alternative exploration of structure and space. Here, contingent place and function are defined by atectonic planes, while the overhead structure represents the infinite continuum of universal space.

3. "50 × 50 House." Mies van der Rohe (Myron Goldsmith, project architect). 1952

The overhead plane of the Collage coupled with the structural sensibility of the Farnsworth House. The glass volume appears to have been carved out of a limitless grid, and merely happens to occur on a random piece of (photocollaged) earth.

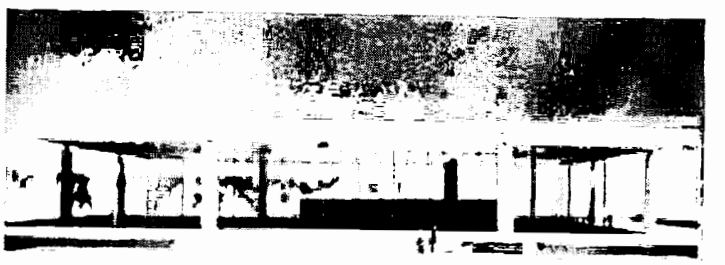
4. Crown Hall, Illinois Institute of Technology. Mies van der Rohe, 1952.

A crystalline monument set into the earth tenuously, appearing as a glass volume barely constrained by its structural cage.



5. Chicago Convention Hall Project, Mies van der Rohe, 1953

The overhead plane is cut and folded to provide enclosure. The resulting structural system appears to alight upon a set of carefully prepared earthwork piers, with the most tenuous possible connection between bearing and spanning systems. Notable too is the inflection of the ground plane to form perimeter seating.



6. Bacardi Office Building Project, Mies van der Rohe (Gene Summers, Project Architect). 1957

An environmentally driven reconsideration of the above structural dialogue. The shading roof bears an obvious resemblance to the effect of the 50 × 50 house, yet the pin connection inverts the logic of the Convention Hall. Classically proportioned piers and spanning elements suggest an earth-based monumentality, supporting a small piece of a universal grid, and sheltering a delicate, very humanly scaled glass box.

7. Bacardi Office Building Project. Mies van der Rohe (Gene Summers, Project Architect). 1957

Model view from a side driveway showing the monumental podium and its relationship to the piers, overhead plane, and glass envelope.

NOTES

[1] According to Project Architect Gene Summers, the head of Bacardi, Jose Bosch, was at least a mild supporter of Castro through 1959, and even accompanied him on his trip to the United Nations in the late 1950s. It was during this trip, however that Bosch left the entourage in Atlanta, having seen first-hand Castro's political leanings. The Bacardi project evaporated with Bosch's defection.

[2] Mies van der Rohe, Ludwig, "Museum for a Small City" in Fritz Neumeyer, *The Artless Word: Mies van der Rohe on the Building Art*. (Cambridge: The MIT Press, 1991) 322.

[3] Goldsmith resurrected his original structural scheme in a 1960 project for a World's Fair Pavilion: a 300-foot square diagonal grid of steel members within an exterior framework supported by four steel piers at the centers of each side. Laconically, Goldsmith reported the height of the frame as 50 feet, and it is irresistible to see this arbitrarily chosen dimension as both a testament and a rebuttal to Mies' conception of the earlier project. See Werner Blaser, ed., *Myron Goldsmith: Buildings and Concepts*. (New York: Rizzoli, 1987) 70-73.

[4] See, for example, Peter Carter, *Mies van der Rohe at Work* (rep., London: Phaidon, 1999) 78-112, and more recently Phyllis Lambert, "Clear Span" in Mies in America (New York: Harry N. Abrams, 2001) 423-521.

[5] Pauline Saliga, "Oral History of Gene Summers." Chicago Architects Oral History Project, (Chicago: The Art Institute of Chicago, 1993). 54.

[6] Saliga, 51-52.

[7] Gene R. Summers, "Letter to Son." *A+U* no. 124, January 1981, 182-185.

[8] Ibid.

[9] This is shown most clearly in a section illustrated in Kenneth Frampton, *Studies in Tectonic Culture*, 204.

[10] The standard photograph of this model gives the false impression that the podium fronted directly on a street, however the plan shows a much more sensitive site strategy, with the complex set into a gentle hill, the podium actually defining a driveway to a rear parking lot.

[11] The Dining Hall has an overall depth to span ratio of 1:10, versus approximately 1:14 for Bacardi. The SOM building, however, uses a lightweight steel truss whose depth allows full integration of overhead lighting, servicing, etc. See Ernst Danz, *Architecture of Skidmore, Owings, and Merrill, 1950-62* (New York: Praeger, 1963) 111-113. Kerbis has suggested that a conversation between her and Summers may have been the impetus behind Mies' experimentation with the gridded clear-span. See Betty J. Blum, "Oral History of Gertrude Kerbis," Chicago Architects Oral History Project (Chicago: The Art Institute of Chicago, 1993) 80.