BERLIN NEUE NATIONALGALERIE.  
A CONTEMPORARY VIEW OF THE  
MODERN TEMPLE

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ABSTRACT
Mies van der Rohe´s approach to architecture through a poetic structural skeleton, abstractly refined to become a universal prototype of the essence of form and spiritualization of space, can be best seen at the Neue Nationalgalerie in Berlin. This unique modern temple recently under refurbishment by the subtle pencil of David Chipperfield [1] will soon have to be prepared to receive the extra additional space designed by the winner competition office leaded by Herzog & De Meuron [2].

Despite the rebirth of the building´s prestige there is still a gap of knowledge on the construction philosophy pursued by Mies van der Rohe, who conceived the Galeria Project as a phenomenological duality of lightness and heaviness in within a constant game of oppositions, exquisitely intended to intensify human emotions. Far beyond a mere construction, the magnificent museum became a place where the Silesia stone terrace seemed to detain the historical time meanwhile the biotite grey steel structure was encapsulating a flexible space embracing the dynamic elapse of life.

The investigation undertaken by this author on the building´s original working drawings at the MvdR Archive in New York revealed unknown details which are helping nowadays to achieve a deeper understanding on the design and construction process of the iconic miesian museum. The underground ventilation channels running beneath the monolithic concrete plinth refreshing the interior volume with perfumed air from the garden´s lindens, altogether with the heroic columns and the freestanding glass membranes of the façades, resume today´s dilemma of the global high-tech city within the natural realm.

Keywords: Mies van der Rohe, Neue Nationalgalerie, Berlin, structure, construction

INTRODUCTION
Throughout the history of architecture there are representative buildings of their time which, overcoming their mere status of constructive artefacts, they manage to become memorable icons capable to impulse a historical argument on the aspirations of civilization. These works acquire the noble condition of builders of the spirit of time confronting the context with refined technology and the use of natural resources to rise a conceptual
architectonic triangle admirably visible at the *Neue Nationalgalerie* in Berlin, currently being restored under the guardian eye of Fritz Neumeyer [3].

This sublime work of architecture from the modern movement designed by the German-American architect Mies van der Rohe opened its doors in September 1968 and was conceived as a modern temple in the light of three values which still today seem to cement the socio-cultural principles of the moment: sustainability, technology and democracy. Therefore, nature, science and transparency manifest their presence in Berlin throughout the green belt around the building perimeter, the heroic structural column and the transparent glass membrane of the façades which transforms the interior space into a collective artistic experience. These issues highly relevant in today’s architectural discourse redefine Mies van der Rohe’s profile upholstering a veil of contemporaneity visible through the recent work of Detlef Mertins [4] and The Now Institute of UCLA’s Urban Planning Department [5] devoted to resolve complex problems of modern cities, placing the *Neue Nationalgalerie* in Berlin among the 100 most influential buildings from the 20th century. The 2019 *International Multidisciplinary Scientific Conference* [6] held in Vienna attracted keen interest among participants on the building’s ability to resist obsolescence claiming its current relevance.

*Figure 1. Lateral view of the *Neue Nationalgalerie* from St. Matthew’s Church. The granite stairway to the top of the plinth with the serene structural pavilion rising over its monolithic surface. Photograph by J. Marco i Llombart, 2014.*
THE MODERN TEMPLE

The Neue Nationalgalerie is a pavilion on a pedestal with three essential architectural elements: a garden stone courtyard, a granite-clad concrete platform, and a notorious steel structure on its surface (Figure 1). The courtyard manifests the beauty as perfection of life, the platform guards the museum’s permanent art collection with a timeless serene neutrality and the pavilion houses temporary exhibitions illuminating with its structural expression the encounter of technology with art. Through the topographic articulation of the base and the vitreous membrane of the pavilion’s façades the city acquires a celebrative presence as a democratic artistic experience of modern space.

Conceptually, the Neue Nationalgalerie insinuates an approach to the German neoclassicism represented by Schinkel whose Aaltes Museum, located nearby at the Museumsinsel, assumed a fundamental indispensable presence difficult to ignore. On the other hand, the building’s scheme revealed the double path to the essence proposed by Guardini [7]: the plinth as an affirmation of the eternal values enclosed in classicism and the pavilion as a project for an ideal future. Whereas the Museum’s concept was embracing the idea of the essence of space, its materiality searched the essence of form (Figure 2).

The construction of the Neue Nationalgalerie synthesized what Mies meant by the true mission of architecture: to achieve the artistic expression in the union between form and material. Constructive details recognize the sincerity of its function according to the apothegm which Mies insistently repeated quoting Saint Thomas Aquinas: Adaequatio Intellectus et rei (adaptation of thought to the facts). Far beyond the invention of a new form, the Neue Nationalgalerie aspired to clarity and structural simplicity, whose construction was based on reason and technical objectivity representative of the values and will of modern era. Construction, central theme in the architectural experimentation of Mies van der Rohe, acquires in Berlin a significant spiritual and philosophical relevance by the search for the constructive essence of the modern temple.

Figure 2. Cross-section through the platform and pavilion of the Neue Nationalgalerie. Drawing by J. Marco i Llombart.
The technical domain of the clear span that Mies had reached in his American trajectory, coupled with his knowledge of the classical architecture rescued from his trip to Greece in 1949, modeled at the Neue Nationalgalerie a double constructive concept: the structural order of the pavilion and the plastic tectonic of the platform.

Conceived with their own identities, the pavilion constitutes an isostatic steel system with 8 columns and a lattice of metal beams modulated at 360 cm, whereas the base becomes a hyper static plinth of pillars, beams and concrete slabs subjected to a structural grid of 720 cm. In both cases, the module of 120 x 120 cm from the stone slabs of the pavement puts in relation to all the elements of the whole providing them of a spatial sense of order and alignment.

The different identity of both constructive systems was reflected with the intervention of two different construction companies: a consortium of metal workers was responsible for the steel construction of the pavilion while Hochtief AG performed the reinforced concrete structure of the platform. Each constructive element of the Neue Nationalgalerie carries a significant meaning that responds to its functional destiny. On the distinct identity of the building elements lies a classicism evident for instance at the entasis of the pavilion’s steel columns with the spherical articulation on its coronation suggesting an epical form of capital. Likewise, the waffle manifestation of the two-way steel structure from the roof reminds the vaults of the Pantheon as well as Schinkel’s Aaltes Museum.

The sincere manifestation of the two constructive systems that materialize platform and pavilion reveals the unfolding of the German-American thinking of the architect: the sense of monolithic entrenchment manifested by the plinth is combined with the refined technological grammar of the steel construction experienced in the United States. The site construction adopts a sense of topographic rooting, as a result of the implantation of the monolithic concrete platform which transforms the context into a place of openness and liberation for the appearance of new relationships with the environment. In the use of reinforced concrete and granite stone from Silesia, Mies will find the adequate material to sculpt in the emptiness of the plot a new architectural presence for Berlin that will have for allies the immanency of time and the mineralization of earth (Figure 3).

Figure 3. Frontal view of the Neue Nationalgalerie from Potsdamstrasse. Historical photograph by Reinhard Friedrich 1968.
The reaffirmation of the place revives in Mies van der Rohe the European tradition of the building as an anchorage, which in Berlin had associated a historical memory underlying in all the voids generated by the war. The conquest of the plinth implicit through the appearance of the steel pavilion on its surface reveals the technological will of Mies as a result of his American praxis. The expressive bidirectional steel structure is monumentally imposed on the esplanade created by the platform to manifest itself as a scenario for the representation of the objective reality of Berlin. The presence of the pavilion, essentialized in the poetic manifestation of its structure, underlines the exaltation of technique as the firm ally of architecture. Technique, Art and City create a work of architecture whose materiality has become the central argument of the Museum, reflecting through the constructive details of the building the strategies and meanings of the art of building or Baukunst, which for Mies van der Rohe constituted the essential content of architecture.

**Figure 4.** South view of the green belt embracing the *Neue Nationalgalerie*. Photograph by J. Marco i Llombart, 2014.

**The green belt around the building perimeter**

The open, flexible and universal essence of the space underneath the dark grey biotite steel roof houses the dynamic course of time whereas the Silesia granite plinth captures the eternal values of classicism. Platform and pavilion are embraced by a green veil designed by Mies van der Rohe to create a contextual microclimate whose freshness, aroma and moisture release an ideal atmosphere for a modern temple conceived to heal, as a conciliator balm, the opposing ideologies of the time (*Figure 4*).

A picturesque landscape blossoms at the Museum courtyard, as a contemplative epilogue to the expressionist paintings from
inside the platform, offering a perfected plasticity of beautifullness representative of the fusion of nature with art. A place where Rodin, Grzimek, Laurens and Marks bronzes \[8\] coexist with a colorful flourishing nature and sparkling silver glints from the water pond. A reflective foil accompanied by two perpendicular granite benches and polygonal flowerbeds cut freely between the stone slabs of the floor grid. At the ends, breaking the symmetry of the courtyard, additional flowerbeds cover its surface with mounds of brilliant perennials and luxuriant trees offering a balanced composition of primary colors. Resembling a bucolic naturalistic canvas, it finds its abstract parallel in the Galeria, whose neoplasticist display of walls recalls Theo van Doesburg’s Rhythm of a Russian Dance \[9\], former Mies van der Rohe’s collaborator in G Magazine during 1923.

The courtyard natural landscape construction, with nine leafy trees among oaks, walnut trees, maples and catalpas, extends around the building perimeter creating a green belt which softly flows into the south mound watered by the presence of the Landwehrkanal and perfumed by a decorative catalpa surrounded by maples, lime trees, oaks and ailanthus. The selection by Mies van der Rohe of extensive cup trees sought the creation of a leafy membrane around the pavilion acting as an organic atmospheric filter which intensified the mystical experience of the modern temple. The coalescence of spontaneous nature with a structural pavilion reveals a contemporary attitude in conciliating natural resources with high technology (Figure 5).

Surprisingly, this modern movement building used the ecological atmospheric ambience to produce the ventilation system of the Museum. A tunnel was excavated under the building foundations, with a 2.20 x 2.20 m cast-in-place concrete square section, to introduce fresh, humid and perfumed air from the south mound of the plot next to the Landwehrkanal. Another two tunnels, with a rectangular 2 x 1 m section, were dug under the platform for the air return exhausting through the courtyard’s back wall. The three tunnels merged into the technical perimetral wall of the machineraum, located at the center of the plinth, from where ventilation air was distributed vertically through a series of ducts running up and down on the interior of two Tinos marble towers to the pavilion’s metal roof for further horizontal display.

A secondary system of air channels excavated in the layer of sandy gravels under the platform and above the main ventilation tunnels was built on concrete to impulse an air curtain from a linear floor diffuser running parallel to the glass façade facing the courtyard. The use of earth as constructive material, carving and digging tunnels and channels to move air from the perimetral green belt to the interior spaces of the Museum reflects a sensitive attitude towards the use of natural resources for building comfort. The uptake of damp air from Landwehrkanal, the vegetablization of the Museum perimeter and the topographic platform seat plane handling, with energy exchange between the ground and the air running inside the channels gave the building an unquestionable participatory will with nature. A profound sustainable approach of contemporary actuality that has proofed how adequate green belts and geoventilation systems are in the use of thermal inertia of the ground to cool intake air from the green belt in summer and heat it in winter (Figure 6).
The heroic structural column

The steel and glass pavilion resting on the timeless granite stones of the plinth celebrates the singular encounter of Art with Technology becoming a permanent scenario for the performance of the Quest of our Time, announced by Henry Moore abstract bronze [10] resting over the exterior platform and the heroic column supporting the magnificent pavilion roof structure designed by Mies van der Rohe.

The cruciform section of the 8.40 m high...
column was built with orthogonal 30 mm steel plates shaping four T profiles of 30 cm flanges and decreasing webs ranging from 96 cm width at the base to 87 cm on the crowning, provoking an entasis as an attempt to correct the optical illusion of hollowness. A 30 mm thick steel plate cruciformly shaped served the transition between the shaft and a cylindrical articulated bolt, 26 cm high and 41 cm of diameter, transversally sectioned for the isostatic articulation at the discharge of the horizontal roof structure (Figure 7).

The steel column designed by Mies van der Rohe in August 1964 was 13.95 m tall and run through the platform slab all the way down to the reinforce concrete foundation. However, in January 1966 (four months after start of construction) Mies decided to reconsider the continuity of the steel column in the interior of the platform and redesigned a new solution based on a concrete column of 1.5 x 1.5 m square section with a carved in chalice inside the capital, therefore reassuring the distinction between the hyper static monolithic concrete structure of the plinth and the isostatic metal structure of the pavilion. The pavilion steel column resigned to be part of the platform to finally be delivered in a square goblet of 124 cm side and 30 cm in height. The anchorage of the steel column into the concrete chalice took place through a plate of 10 cm thick with 16 connection bolts of 9 cm diameter penetrating 2 m into the concrete column shaft. The platform was meant to recognize the timeless values of history throughout its concrete monolithic structure, whereas the steel column monumentally standing up above the plinth symbolized the new era coming ahead. Eight columns supported 1250 Tons of the roof structural square grid of 64.80 m side. The two-dimensional horizontal steel structure of T-shaped profiles with 1.8 m deep welded web girders every 3.6 m span was arranged in 324 waffles. To reduce the optical distortion of the buckling from the structural weight and the 14 km of welds a camber was introduced of 10 cm at the center of the cover and 5 cm at the corners. The perimeter beam incorporated a top wing to support a UPN 140 profile that encapsulated the slope mortar of the deck. The waterproofing was delivered to the UPN being pressed by an 8 mm plate captured by an L-shape profile drawing a thin band of 13 cm insinuating a subtle cornice at the building perimeter (Figure 8).

Between the two horizontal planes of the building formed by the steel roof and the granite esplanade of the platform, the interior space was expansively projected towards the city with a horizontality broken only by two towers of Tinos marble designed to drive the HVAC facilities of the museum.

The accurate and refined steel structure became a symbol of mankind achievements in accordance with the architect’s intent: “that architecture is an expression of the structure of civilization was a fundamental consideration of Mies van der Rohe’s philosophy -Only a relation with touches the essence of the time can be real- he said. -This relation I like to call a truth relation. Truth in the sense of Thomas Aquinas, as the Adequatio et rei intellectus;” [11].
Figure 7. Steel column from the **Neue Nationalgalerie** in Berlin. Photograph by J. Marco i Llombart, 2014. Original column drawing (January 1966 version) by Mies van der Rohe Office. New York MoMA, MvdR Archive.

Figure 8. Sketch by Mies van der Rohe of the steel column delivered inside the chalice of the concrete column. Original chalice drawing by Mies van der Rohe Office. New York MoMA, MvdR Archive.
The glass membrane as an urban canvas

A perimetral ventilation fissure accompanied the glass canvas of the pavilion façade by setting a buoyancy effect on the granite pavement. It accentuated the organic experience of space intensified by the soft air curtain ascending from the slot diffuser. The 7 cm wide vacuum supposed the structural disruption of the reticular system of the concrete floorslab and hence, the duplicity of the seal beam. This circumstance Mies van der Rohe would use it to lift the interior slab 20 cm leveling the mortar slope and waterproofing sheets contained in the exterior slab. The grill was hosted on a granite ashlar 15 cm wide and 8 cm in height, producing a highlight of 4 cm slightly rounded for a leveled delivery with the 40 mm granite floor slabs. This elegant detail built the interior boundary space announcing the presence of the glass façade. A crystalline canvas understood by Mies van der Rohe as a substance to print Berlin urban landscape unfolded in two realities: the city totally opened to the pavilion space as a social collective experience and the courtyard as an introspective space for the contemplation of beauty (Figure 9).

The first was a panoramic glass canvas of 8.40 m of height with a 201 m perimeter modulated by steel mullions every 3.60 m matching the metal roof structure. Each module was divided in two parts of proportions 1/3 and 2/3 (2.8 and 5.6 m in height respectively). The mullions were formed by calibrated steel sections of 50 x 250 mm. They served as lateral supporters to the siege of 40 x 80 mm on which rested 25 x 55 mm jonquils pressing a 16 mm thick glass. The steel sections arranged on the edges with the pronouncement of the jonquils over the sieges created shadow lines emphasizing the slenderness of the steel conquering the immensity of the panoramic canvas. The glass façade rested on the floor slab over a 10 mm thick rectangular steel channel 180 mm high and 80 mm wide. On the top, the delivery of the façade with the horizontal structural waffle grid was produced through a sliding U-shaped 10 mm steel plate of 12 cm high and 8 cm wide. The lower flange received the vertical carpentry mullions and horizontal jonquils to capture the glass. The hollow part of the connector was destined to host a rectangular nerve of 10 cm high and 4 cm in width welded to the horizontal roof structure. Therefore, a slip-joint with a set of 6 cm was released to absorb structural deformations, and thus, a complete detachment of the panoramic façade from the steel roof structure was conquered. The glass membrane of the pavilion became the expression of modern technique transforming the façade into a thin layer dividing the two worlds architecture offers: the truth of the urban realm being observed and the space where it is intended (Figure 10). This duality of city and space (place and time) becomes a relevant issue for Mies van der Rohe as he “believes that architecture is not bound to the day nor to eternity but to the epoch. Only a genuine historical movement makes it what it is. Architecture is the interpretation of a happening in history, the genuine consummation of its inner movement, the fulfilment and expression of its essential nature” [12].

CONCLUSIONS

The Neue Nationalgalerie in Berlin designed by the architect Mies van der Rohe, reflects more than ever the spirit of conquest of modern society. Conquers the city by introducing
its presence inside the pavilion as a democratic collective experience of the urban reality.

Conquers nature by respectfully interacting with water, trees and greenery, using soil as a constructive material by carving channels to impulse perfumed, fresh and a natural atmospheric ambience into the interior space of the building.

Conquers glass by dominating the huge façade canvases with the unbelieving slenderness of the masterly designed steel frames, expressing through the noble and sincere use of materials a worthy manifestation of human achievement.

Conquers beauty through the ideal, colorful and sensual landscaped courtyard conceived as the epic perfection of life.
REFERENCES


[2] Herzog&De Meuron, swiss architects that won in 2016 the competition to design the art gallery building connected to the Neue Nationalgalerie by an underground tunnel.


[8] Rodin, Grzimek, Laurens and Marks are artists whose bronzes standing on the Museum courtyard reflect a sensual and ideal image of man incapable of any sort of resistance.


