

Mies van der Rohe, Neue Nationalgalerie, Berlin, Germany, 1968. Collage of Mies van der Rohe showing the main design intent of the floor covering for the exhibition room in the basement floor. © bpk / Kunstbibliothek, SMB / Dietmar Katz, 1963.

The *Neue Nationalgalerie*: the Refurbishment of a Modern Monument

BY MARTIJN JASPERS

After 46 years of continuous use, Mies van der Rohe's *Neue Nationalgalerie* in Berlin closed its doors to start works on its refurbishment. Being a masterpiece of the second half of the 20th century, conventional standards in terms of dealing with high-level heritage must be adhered to. The quality of this refurbishment can be found in the project's holistic approach. Not only by taking into account the visual integrity but also by paying attention to its physical substance, time-bound and classical elements, the added value of the project is created.

In times of a divided city and country, the appointment of Mies van der Rohe for the design of a “gallery of the 20th century” reflected the desire for a cultural rebirth in West Berlin. Following the ground-breaking ceremony in 1965, the *Neue Nationalgalerie* opened on the 15th September 1968¹ and provided a house for the outstanding collection of both 19th and 20th century art. The gallery, widely hailed as a major work in the oeuvre of Mies van der Rohe and as an icon of late modernism, was the last development in the typological series of large column-free universal spaces. With this museum, Mies van der Rohe finalized the second and final museum of his career, moreover his only German post-war building, thus returning to the roots of his architectural practice.

After 46 years of continuous use, the building closed its doors on the 31st of December 2014. Paintings were stored, sculptures left the sculpture garden and furniture was packed, announcing the end of the gallery's first lifecycle.

Approaching the Project

Due to its continuous use as well as the users' respect for the building, no significant structural changes were made up until its point of closure. Preventative measures and maintenance did not result in overly designed interventions, but merely served the building to keep it functioning. The necessity for its refurbishment lies in the subtle damage, the outdated building services and fire safety issues.

Being one of the first high-tech museums in Germany at its time of construction, the *Neue Nationalgalerie* was provided with an in-depth designed technical infrastructure, following the needs of that time. Now, 50 years later, the demands for the technical performance of the museum hadn't changed much, but rather the technical requirements for its use.

Therefore, at the center of our planning, stands the moderation of the conflict between the requirements for the use of the building and those of the physical monument. The

conflict was therefore not between monument values and external requirements or expectations, but in the internal conflict between different monument values.

The conviction that a careful anamnesis and diagnosis sets the basis for every therapy, made us strive for a detailed and extensive basic evaluation, running parallel to the concept and the design development phases. Aspects of building history, historic preservation and conservation, restoration, visual integrity and materiality were all taken into account.

Clarification of Tasks

A clear and coherent impression of the planning and construction history of the *Neue Nationalgalerie* was obtained by going through the office archives of Mies van der Rohe at the Museum of Modern Art in New York and the private archives at the Library of Congress in Washington. Having scanned, saved in high resolution and gathered in a database the relevant drawings for the refurbishment, they were ready to be used during the planning process. In addition to the American archives, the viewing of archives in Berlin² revealed not only unique planning documentation, including floor plans, sections and details, but primarily unpublished photos and slides revealing insights into the construction stages of the building.

Visiting the American works of Mies van der Rohe provided an opportunity to get a sense of the way his buildings have been dealt with in USA. The Dominion Center in Toronto, visits to Chicago and Houston and the Seagram building in New York revealed, despite the different building types, consistent tendencies: repetitive damage such as imperfect waterproofing on the terraces and roofs and corrosion and leakage of the curtain wall façades. The treatment of these building-physical and energy-related deficits is in general limited to a structural maintenance and repairs without trying to upgrade the building and in that way accepting its limitations. The American interest in the conservation of the Mies van der Rohe monuments

focuses on the visual integrity of the outer appearance and the appearance of the lobby, while all other rooms and large parts of the original building substance are treated in a more pragmatic way. As an example, all travertine flooring was completely renewed on the plaza of the 860-880 Lake Shore Drive Apartments.

Mies van der Rohe's buildings in the USA are being regarded as an outstanding contribution to the national heritage. They enjoy a great and broad appreciation.

Concept and Design Development

Only a limited set of preliminary requirements formed the basis for the preliminary planning of the refurbishment. Therefore, a thorough examination of the current situation of the building was executed.

In the recording of the status quo of the building, a full sense of the misused areas and the areas where multiple uses occurred was obtained (figures 01-02). The under-dimensioned visitor services such as the cloakroom, ticket counter and museum shop; the lack of space for the preparation of exhibitions, the shortcomings in the transport routes for the art and the too restricted back-of-house areas, such as the workshop and storage areas.

The restructuring of the use starts with the re-establishment of Mies van der Rohe's original layout for the public areas of the basement floor. By removing the interim cloakroom from the northern museum corridor and the book/museum shop from the foyer, Mies van der Rohe's ideal plan is reinstated. New positions for both functions were found in the existing sculpture and painting storage areas. This conversion of the storage areas and the need for additional technical back-of-house spaces led to the insertion of a new underground construction underneath the front podium of the building (figure 03).

Extending the building was initially not part of the original planning assignment, but developed as a result of the clarification of tasks in combination with the documentation of the status quo.

This intervention is justified by the invisibility of this extension from the external and internal public areas. Furthermore, the heritage value stemming from the autonomy and pure existence of all functional areas of the museum within the outline of the building itself is not diminished by removing the storage areas outside of the built area (figure 09). Any further structural alterations or interventions were abstained from to the greatest extent possible.

Age-value

As the result of the shortage of materials, construction technologies being in rapid development as well as the zeal for optimization and minimization, the refurbishment of the modern monument faces many challenges. Besides rapid aging, susceptibility to damage and the lack of a robust construction, a classic patina, traces of use and wear, repairs, additions and structural alterations add to the complexity of the refurbishment of Mies van der Rohe's *Neue Nationalgalerie*.

The mission statement for its refurbishment is the principal acceptance of aging, traces of use and old repairs, as

long as the overall visual appearance is not significantly affected and the usability is not limited. Together with ProDenkmal as restoration specialist planners, a strategy to deal with aging was developed. All solutions can be found within the field of repairs.

Significance of the Physical Substance

Being a masterpiece of the second half of the 20th century, conventional standards in terms of dealing with high-level heritage must be adhered to, regardless of the relative youth of the building and the seemingly light reproducibility of its components.

In the original *Thesenpapier zur Denkmalpflege*³, the goal was set to keep as much as possible of the original substance, referring to the monument as a whole. Drawing up this thesis paper at the start of the planning, it did become clear during the planning process that it is only possible to fulfill this precondition with certain limitations. Despite the respect towards the original substance, the demands set for the continuation of the use of the building as a museum result in loss of material. The measures that need to be taken are more specifically: the spatial change of the back-of-house area, structural fire protection measures, the repair of concrete, the protection against corrosion, the full replacement of the insulation and waterproofing as well as the full renewal of the transient building services of which only the visible components such as the light fittings, ventilation grilles et cetera can be kept (figure 08).

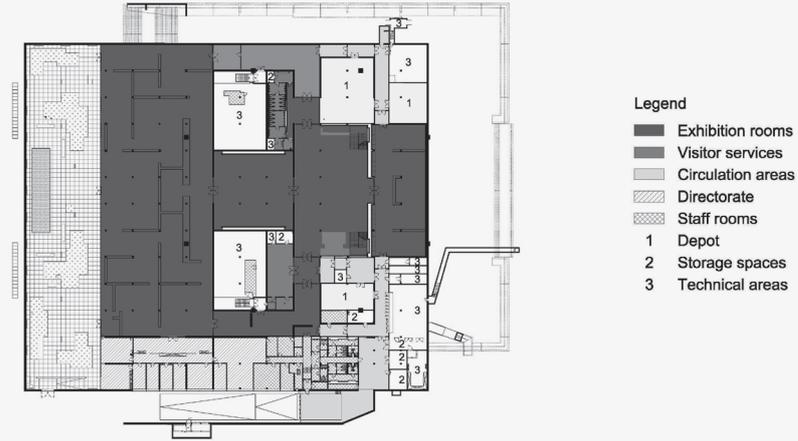
The complexity of these measures is not to be found in the measure itself, but in the domino effect the measures cause for the refurbishment. As an example, situations such as the renewal of the malfunctioning floor heating in the upper hall result in the dismantling of the granite flooring and the demolition of the screed.

This depth of intervention makes it inevitable that almost the full interior of the *Neue Nationalgalerie* is dismantled, resulting in the possibility to repair the hidden building parts and renew the hidden technical infrastructure. The inability to deal with certain repairs and modifications on site results in the dismantling and storage of over 30,000 elements and construction parts. These have been provided with identification labels, recorded in a database and marked on repositioning plans (figure 07).

Acceptance of the Time-bound Elements

The *Neue Nationalgalerie* appears timelessly modern, due to its classical basic motif of the temple hall placed on a podium, the high degree of abstraction of the visual appearance of the building, its modular design principles and the use of granite, marble, steel, bronze and precious woods. Immediately time-bound, on the other hand, are the modular ceiling, the downlights in the exhibition rooms, the wall-to-wall carpeting and the ingrain wallpaper in the exhibition rooms of the basement floor, the use of curtains and the floor-flex tiles in the back-of-house areas.

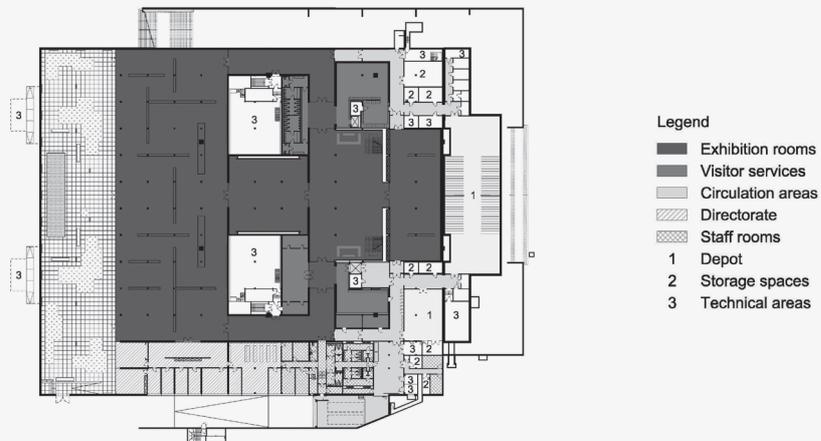
Although both characteristics should be preserved equally in terms of the authenticity of the monument, the time-bound aspects were brought into question during the



01 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Basement floor with the status quo of the building, status 2014.
© David Chipperfield Architects for the *Bundesamt für Bauwesen und Raumordnung*.



02 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Basement floor with the identified misused areas and the areas with multiple uses, status 2014.
© David Chipperfield Architects for the *Bundesamt für Bauwesen und Raumordnung*.



03 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Refurbishment by David Chipperfield Architects, 2017. Basement floor after the restructuring of the use, planning status 2014. © David Chipperfield Architects for the *Bundesamt für Bauwesen und Raumordnung*.

planning process. These situate the gallery in its time of construction and give the 1960s in that way a strong presence.

Curtain upper Hall

Part of Mies van der Rohe's planning for the upper hall was a semi-transparent curtain. It was arranged on three sides of the glazed hall, could be freely opened and closed with the help of an electric motor and could be parked as packages in fixed positions. Hard, functional reasons formed the basis for the necessity of this curtain: in particular, the requirement of a glare and sun protection layer, the reduction of UV radiation, the formation of an air buffer for the curtain wall façades and the reflection of the artificial light to guarantee the spatial luminance of the hall at night. Mies van der Rohe complemented these requirements with aesthetic intentions: the curtain should "enrich the architectural appearance of the great hall in an agreeable way"⁴.

The original curtain from 1968 was materially renewed in the 1990s, and finally removed without replacement in 2002. This measure was widely hailed as a liberation for the building. The hall became a permanently transparent display case in the urban space.

The refurbishment requirements for the upper hall in terms of building physics and lighting comply with those at the time of construction. Because of the connotations of coziness, homeliness and the limitations associated with the curtain during special exhibitions, the user argued against it. Besides being part of the construction of the 1960s, the curtain determined to a great extent the appearance and impact of the hall. As a soft element, it formed a direct counterpart for the modularity of the building and its hard building materials such as steel, glass and natural stone.

The compromise achieved is to reconstruct the curtain by means of the samples from the manufacturer, while also providing the possibility of removing the curtain temporarily and storing it in the building. In addition, there is a second system on which, with little effort, exhibition-related hangings for darkening the space can be hung.

Carpet

The early collages of Mies van der Rohe and the plans in the presentation folder of 1963⁵ already show the main design intent for the flooring of the exhibition rooms: a fluid transition between inside and outside, the exhibition rooms and the sculpture garden. The documents show the flooring as a hard covering, structured by a grid. A covering that stands in contrast with the smooth ceiling (figure 06). Following this design intent, a terrazzo floor was provided in the preliminary design phase, but was never realized as such. As decided during a planning meeting in 1965 in Chicago, a neutral, light grey carpet in *Woll-bouclé*, in contrast with a modular ceiling was used for the exhibition rooms in the basement floor, with the exception of the main stair hall and the *Graphischen Kabinett*. By adapting the color and pattern of the carpet to the chromaticity and structure of the granite flooring, the impression of a fluid transition between inside and outside had to be created. Although this decision was implemented, no original substance is present today in

situ since the original carpet was renewed several times in the past decades.

During the refurbishment planning meetings, the user put multiple arguments forward against the use of carpet as floor covering for the exhibition rooms: functional reasons, such as maintenance requirements and durability, but also curatorial issues, such as the difficulty of presenting contemporary sculptures, which are designed without base and thus need to stand on hard surfaces, the cozy and un-museum-like character that is associated with carpet and the time-dependency of the material which projects all exhibited art back to the 1960s.

All these arguments cannot be neglected. On the other hand, it is equally undeniable that the carpet is an important time-bound element whose visual, auditory and tactile quality characterizes, in a crucial way, the exhibition rooms and therefore belongs unquestionably to the fundamental nature of the *Neue Nationalgalerie*. The final decision of reintroducing the carpet in the exhibition rooms became the only topic in this project which did not fall in full agreement of all concerned.

When aesthetically adapting the rooms for the presentation of modern and contemporary art to current viewing habits and visual expectations, all interventions will be recognizable as being time-bound. The interventions in the major refurbishment projects of the past decades, which appeared fresh and contemporary at their opening, are now outdated themselves and prove to be poorly sustainable in terms of aesthetics after 10 or 20 years of use. Therefore, the acceptance of the *Neue Nationalgalerie's* aesthetic roots in the 1960s as a specific quality and to preserve them as such is a logical consequence.

Treatment of the Original Defects and Deficiencies

From the beginning, the curtain wall façade of the *Neue Nationalgalerie* had to deal with two main issues: the breakage of glass and condensation, both resulting in a significant visual impact for the building. The façade designed by Mies van der Rohe consists of large-sized single glass sheets and a post and beam construction made of sharp-edged, thermally non-separated solid profiles. Despite the fact that this system of construction did not correspond with to the state of art at the time, Mies van der Rohe wanted this solution from an aesthetic motive. His buildings in the USA, built in the same period, were already provided with insulating glass panes and insulated profiles.

The heavy condensation problems were caused by the climate control of the upper exhibition hall. As a result, small gutters for the collection of the condensation water were installed in front of the windows in 1969. All other measures taken, such as the impregnation of the curtains, tried to find solutions for the problems but never eliminated the sources of the problems themselves. The same applies for the approach to the problem of glass breakage. Since 1970, broken sheets were repeatedly replaced.

As a consequence of the glass industry's abandonment of the production of these approx. 360 cm wide upper panes, all sheets embedded after 1972 consisted of two single sheets

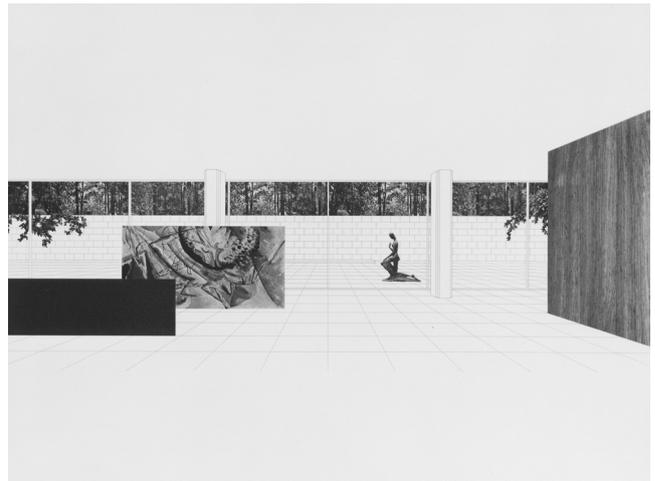
04 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. © Ute Zscharnt for David Chipperfield Architects, 2012.



05 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. © Ute Zscharnt for David Chipperfield Architects, 2012.



06 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Collage of Mies van der Rohe showing the main design intent of the floor covering for the exhibition room in the basement floor. © bpk / Kunstbibliothek, SMB / Dietmar Katz, 1963.



07 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Refurbishment by David Chipperfield Architects, 2017. The original cloakrooms in the upper hall are fully dismantled. The repair of the wooden paneling will be executed in a workshop environment. © Ute Zscharnt for David Chipperfield Architects, 2016.



08 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Refurbishment by David Chipperfield Architects, 2017. A new central ventilation and air-conditioning plant will be installed in the former heating plant room. © Ute Zscharnt for David Chipperfield Architects, 2013.

that were connected through a silicone joint in the middle. These new panes stand in contrast with the few existing original sheets due to their difference in color shade and their middle joint. The effect changes the appearance of the upper hall by diverging from the intended composition of the undivided upper panel and the divided lower part of the façade.

A first analysis of the causes revealed a complex web of contributing factors, comprising the static undersized upper sheets, the corrosion in the area of the glazing beads and considerable deformation caused by thermal expansions and wind loads. The movement of the façade construction is obstructed in the area of its upper fixture through the specific execution of its brace construction. The horizontal movement was discussed to a large extent during the planning process, but ultimately ignored in the final detailing of the façade.

Several months of measurements with the aid of a 3D scanner and a local weather station provided an objective image of the actual considerable deformations related to outside temperature and wind. The results of this measurement were transferred into a deformation diagram, illustrating the fixed point, the directions of movement and the longitudinal extensions (figure 10).

The package of measures for the façade consists of several components: 3 new vertical expansion posts are introduced on each side of the façade, a structural bonding of the glass sheets created by the shear-resistant design of the corner areas and a segmentation of the brace construction to ensure a restraint-free vertical expansion of the façade (figure 11).

However, these structural improvements of the façade do not include any thermal improvements. In the concept design phase, detailed studies were made on the consequences of a thermal upgrade of the façade and what effect this upgrade would have on the appearance of the façade itself.

In a first version, the original glazing is replaced by appropriately dimensioned laminated safety glass, consisting of two annealed mono-panes, joined using a film. Window posts, profiles and window beading are preserved. The façade construction is not thermally insulated.

The second variation shows a preservation of the façade posts and the corner posts. The original glazing is replaced by double-glazing. In this version, the window profiles and window beading cannot be preserved in the original geometry.

A third option foresees a fully thermally insulated façade. This would obviously lead to the loss of the complete original geometry of the façade construction (figure 12).

It is easy to understand that the last two options would not only lead to a very significant or complete loss of original substance, but that they would also dramatically change the appearance of the building. Furthermore, financially, the careful repair with only the absolutely necessary modifications is superior to the alternatives.

As a result of the discussions among all parties involved in the project, a clear decision was made to pursue the first alternative. As a result, there will still be condensation on the windows even after the refurbishment of the building, however in contrast to the past, this will be with controlled and reasonable consequences.

We do not consider the non-insulated façade with condensation as a deficit, but as a time-bound characteristic of the building of which the negative impact must be reduced.

Interventions – Facilities for the Visitors

A common goal of the planning was to refrain, as far as possible, from visible, designed interventions. This premise was based on the following three motivations. First and foremost is the utmost respect for the work of Mies van der Rohe. Secondly, our attitude as an invisible architect speaks against a clearly visible intervention. Thirdly, there is not enough critical mass of necessary interventions or additions, to justify our own handwriting.

The only exception of this goal is the conversion of the storage areas for paintings and sculptures into facilities for the visitors, more precisely: the visitors' cloakroom and the book/museum shop.

For both rooms, the initial concept was developed to recognizably convert them, without designing them anew. This would allow the new use to find its temporary place whilst the old use as a depot can still be read. The visitor would clearly perceive that he is entering a space that was not originally part of the public area of the building. This concept stands in contrast with a one-to-one continuation of Mies van der Rohe's design, including a continuity in the materials of the granite floor covering, the modular ceiling, the white walls, and the red oak furniture, as well as the incorporation of Mies van der Rohe's modular principles and his language of detailing.

A hybrid version was chosen in the end. As a consequence of its use up until now, the space lacks the level of finishing of the public area. By accepting this lack of finishing, and therefore renouncing a suspended ceiling and wall covering, the otherwise invisible concrete elements such as the coffered ceiling, the columns and walls are given presence. Decisive for the visibility of our actions is not the omission, but the pointing out of the rough material and the not ideal architectural elements that are part of the space.

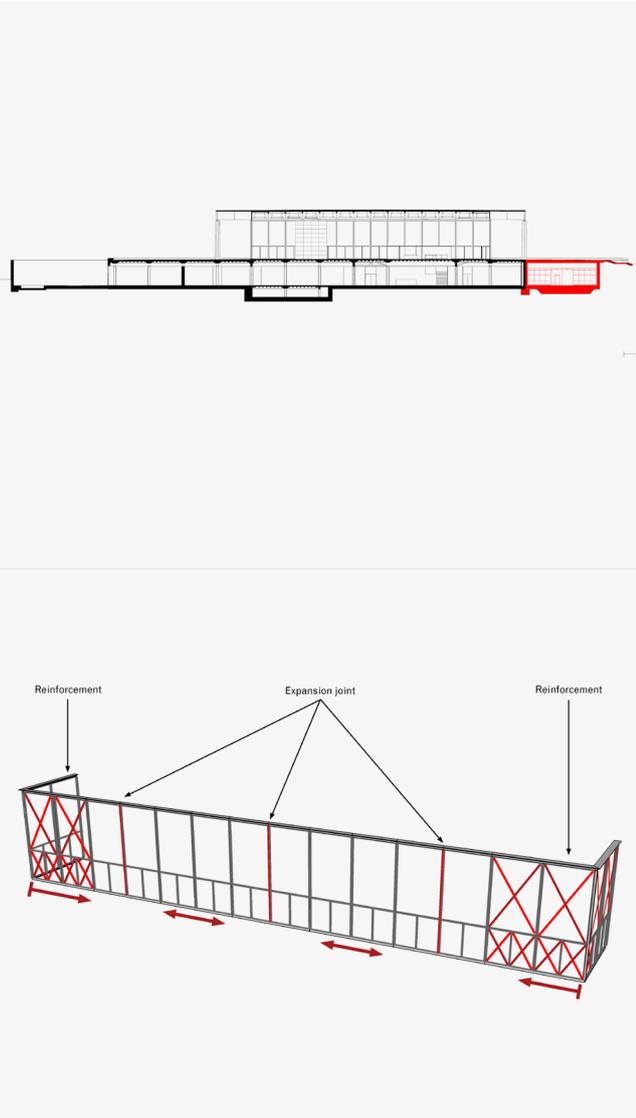
Conclusion

When talking about a modern monument, one could easily argue that its intrinsic heritage value lays in being a modern construction. Whereas numerous refurbishment projects focus only on the visual appearance of the monument, the quality of the refurbishment of the *Neue Nationalgalerie* lies in the project's holistic approach. The added value is created not only by taking the visual integrity into account but also by paying attention to its physical substance, time-bound and classical elements. The refurbishment refuses to aesthetically adapt the museum to current viewing habits and visual expectations and in that way, abstains from "refreshing" the image of the building. Instead, it was the careful moderation between the various monument values of the building that guided each decision. It is not the image, but the substance of the construction that is to be put first.

Notes

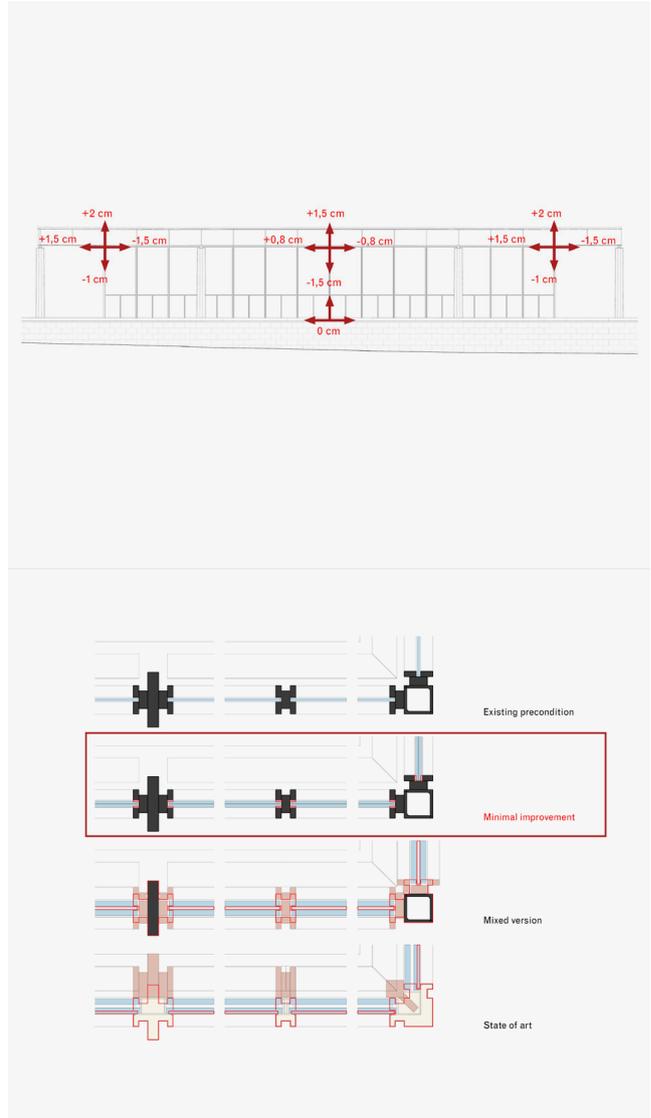
- 1 The building was completed one year before Mies van der Rohe's death.

09 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Refurbishment by David Chipperfield Architects, 2017. Section indicating the new construction of the storage area underneath the podium. © David Chipperfield Architects for the *Bundesamt für Bauwesen und Raumordnung*.



11 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Refurbishment by David Chipperfield Architects, 2017. The package of measures for the curtain wall façade with the introduction of three vertical expansion posts and shear-resistant design of the corner areas. © David Chipperfield Architects for the *Bundesamt für Bauwesen und Raumordnung*.

10 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Diagram for the deformation of the façade caused by thermal expansion and wind loads, indicating the fixed point, the directions of the movement and the longitudinal extensions. © David Chipperfield Architects for the *Bundesamt für Bauwesen und Raumordnung*.



12 Mies van der Rohe, *Neue Nationalgalerie*, Berlin, Germany, 1968. Refurbishment by David Chipperfield Architects, 2017. Studies for the consequences of a thermal upgrade of the façade. Existing precondition and planning variations, planning status 2015. © David Chipperfield Architects for the *Bundesamt für Bauwesen und Raumordnung*.

- 2 The visited archives in Berlin are: *Kunstabibliothek*, *Staatliche Museen zu Berlin*; *Neue Nationalgalerie (Pressearchiv, Fotosammlung)*, *Staatliche Museen zu Berlin*; *Institut für Museumsforschung (i.a. Diasammlungen Waetzoldt und Grote)*, *Staatliche Museen zu Berlin*; *Zentralarchiv*, *Staatliche Museen zu Berlin*; *Akademie der Künste (i.a. Fotosammlung Friedrich)* Berlin; *Landesarchiv Berlin*; *Berlinische Galerie*; *Bundesamt für Bauordnung und Raumwesen (BBR)*; *Foto Marburg, Bildindex*; *bpk Bildagentur Preußischer Kulturbesitz*; *Bezirksamt Berlin-Tiergarten, Plankammer und Archiv Fachbereich Bau- und Wohnungsaufsicht*.
- 3 Translated: thesis paper for conservation.
- 4 Mies van der Rohe, *Letter to the General Director of the Staatliche Museen Stephan Waetzoldt* [letter] the Museum of Modern Art Archives, 1966.

- 5 One year after the commissioning, Mies van der Rohe presented, in 1963, the first design for his museum at the *Kulturforum* in Berlin. The folder consists of descriptive texts, plans, collages and model pictures.

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