

# Building Endurance: Renovation and extension of the Zurich Kongresshaus and Tonhalle (2017–2021)

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## Abstract

The Zurich Convention Center (Kongresshaus Zürich, 1939) was designed by architects Haefeli Moser Steiger as a modern extension and further development of the late-nineteenth-century Zurich Tonhalle (1895). Starting as a centre-piece of the Swiss National Exhibition of 1939, the combined building complex has gradually become an important cultural institution and remains one of the most significant architectural works in Switzerland from the first half of the twentieth century. In the decades since its opening, the Kongresshaus and Tonhalle complex were further adapted in the 1950s and 70s, and controversially modified and renovated in the 1980s. This article aims to analyse key aspects of the renovation measures undertaken between 2017 and 2021 from a dual perspective—architectural and structural. In retrospect, it was the interdisciplinary collaboration that made it possible not only to preserve the integral spatial qualities of the building complex, but also to enhance them in a targeted manner. This process involved both the deconstruction of more recent structural additions and the necessary restoration and expansion of the historic load-bearing structures. Like Haefeli Moser Steiger’s original design, these recent interventions emphasize a distinct process known in German as *weiterbauen*, which stresses continuity and completeness in repair and renovation while respecting and enhancing the qualities of an existing work. While relatively little has been written or published on the recent renovation project, the proposed contribution brings to light a complex case study with important lessons for understanding an existing building and developing its overall and enduring qualities for a long-term future.

## Keywords

Zurich Kongresshaus, Tonhalle, Renovation, Weiterbauen, Haefeli Moser Steiger.

## Introduction

The Zurich *Tonhalle* (Concert Hall, 1895) and *Kongresshaus*, (Convention Center, 1939) are buildings characterized by an accumulation of demolition, renovation, and extension efforts during numerous time periods<sup>1</sup>. Fellner and Helmer’s original Tonhalle and Trocadéro was built in 1895, but only around 40 years later, it was partially demolished in the late 1930s to make way for the Kongresshaus extension<sup>2</sup> by Haefeli Moser Steiger Architects<sup>3</sup>. The resultant five connected buildings (*Los I – V*) today form a constellation of neoclassical and modern architectural design<sup>4</sup> on a prominent site near the shore of Lake Zurich (Fig. 1)<sup>5</sup>. Considering the Kongresshaus’ major later alterations, renovations, and subsequent extensions dating from 1955, 1978, 1985, 2001, and most recently from 2017–21, the site now is a complex archaeological record of Swiss construction practices, architectural and engineering design practice, dating from the late nineteenth century to the present day.

The buildings’ most recent renovation and extension project from 2017–21 involved considerable challenges and





Fig. 3 Zurich, Renovation work and construction site photograph from 1985 showing the *Panoramasaal* on top of the existing *Los II* terrace, (photo by W. Huber, 1985).



Fig. 4 Zurich, The Tonhalle Foyer following the completion of the 2017–2021 renovation, showing the extended terrace, new restaurant, and open views to Lake Zurich and the Alps, (photo by P. Fleming, 2023).

for contemporary transformation<sup>7</sup>. In this case the architects conducted a thorough analysis of the original architectural intent from Haefeli Moser Steiger and implemented targeted deconstructions to restore the spatial clarity, openness, and generosity characteristic of interwar modernism. It is noteworthy that Haefeli Moser Steiger, in their 1939 design, already employed a comparable design methodology. This is particularly evident at the junction between *Los V* and *Los III* of the site, where the deliberate repositioning of the staircases led to a spatial interweaving of architectural expressions from two distinct eras<sup>8</sup>. A comparable example in the recent renovation is found in *Los II*, where the removal of the *Panoramasaal* (Panoramic Hall) – an addition from the 1980s (Fig. 3) – re-established the building’s relationship with Lake Zürich and enabled the creation of a publicly accessible restaurant and terrace (Fig. 4). This intervention contributed significantly to the urban activation and permeability of the site. Likewise, the original ground floor *Gartensaal* was reinterpreted and now functions as a *Gartensaal* foyer, serving as a connective spatial element between various programme areas. Flanking the existing foyer, two new halls were added – one facing the lake, the other oriented towards the city. These additions also facilitated the creation of a small internal courtyard and garden next to *Los III*, providing natural daylight to adjacent spaces, much like the original and larger *Gartenhof* (Garden Center) designed by Haefeli Moser Steiger in this area of the site in the 1930s but lost in the 1980s work.

Another key architectural intervention in the 2017–21 renovation project was the spatial reopening of the *Kongressvestibül* in *Los III*. Over the years, this long vestibule had been enclosed and radically shortened, and the impressive openness across the entire site and city block – from Claridenstrasse to Beethovenstrasse – had become imperceptible. Through careful deconstruction, the generosity and transparency of the 1930s design were restored. Lost or fragmented architectural elements were selectively reconstructed according to the logic of the existing fabric (Fig. 2) or reinterpreted in light of new functional requirements. This approach naturally led to a partial reconstruction of the main staircase, while the opposite side of the vestibule was reconfigured as a service zone, including a bar for future uses. Branching from the *Kongressvestibül*, new circulation corridors were further





Fig. 5 Zurich, The re-opened Kongressvestibül following the completion of the 2017–2021 renovation, showing the new internal courtyard and garden on the left, and the reconstructed main stair on the right. © Kongresshaus-Stiftung Zurich.

Fig. 6 Zurich, The Zurich Kongresshaus construction site during the 2017–2021 renovation, showing the extent of engineering interventions around the original 1930s *Gartensaal* structure. © Kongresshaus-Stiftung Zurich.

introduced in *Los I* and *IV*, serving as a new circulation backbone for the entire complex. These interventions aimed not only to enhance spatial permeability but also to optimise operational workflows.

Finally, in *Los V*, the large *Tonhalle* was restored with a high level of preservation expertise. The refurbishment of its 1895 interior, including ceiling paintings, *scagliola* (stucco marble), and genuine gilding, was carried out in close coordination with preservation authorities. The differentiated design language introduced by Haefeli Moser Steiger in their 1930s work was carefully integrated into a new overall composition within the interior.

### Structural engineering renovation (2017–2021)

Structural engineering was led by Conzett Bronzini Partner AG with a team of three engineers, including the first author. Significant challenges arose due to the wide range of historical construction periods and materials present in the existing building, missing archival plans and documentation of certain areas of the existing structures, and the ground water and geological condition of the site. For example, regarding the site, the Kongresshaus' 1930s reinforced concrete structure was originally built on a variety of foundations and pilings, including many softwood timber piles around 20 m long<sup>9</sup>. These timber piles were used to reach deep down through numerous geological layers of soft clay with no apparent geological capacity to withstand structural loads. New reinforced concrete piles and micropiles therefore also had to be built to a similar depth of 20–25m, including in areas within the existing buildings.

The site's geology and structural engineering planning were further compounded by ground water issues. Due to the construction site's proximity next to Lake Zurich, along with limitations to install conventional sheet piling directly next to the existing building, it was not possible to create a completely enclosed area in which the ground water level could be strictly controlled and temporarily lowered for construction purposes. Nearby buildings were also constructed on timber piles, which were designed to always stay completely submerged in the ground water to avoid any long-term decay. Strict limitations on the ground water level at the construction site



Fig. 7 Zurich, Intensive demolitions and structural interventions within the Kongresshaus *Los I* area, while still respecting the original mushroom column and flat slab structures designed by Robert Maillart, (photo by P. Fleming, 2018).

were therefore set early in the project to avoid any negative effects on the overall surrounding area and the timber piles of neighboring buildings. These limitations meant that any excavations for extending the building had to be performed in phases and under water in a partially flooded site (Fig. 6). Demolitions and construction in the basement level of the existing buildings had to be carefully planned in a targeted manner. For example, although the majority of the 1980s structure around the *Los II Gartensaal* area was planned to be demolished (Fig. 6), the existing basement level floor and walls from the 1980s renovation were kept intact to minimize or avoid potential problems associated with the site's ground water and unfavorable geology. New reinforced concrete micropiles were therefore drilled through the existing 1980s basement floor with local temporary measures to the control ground water directly around the micropile drill holes. Such engineering solutions were simple and very practical, yet they allowed the project to avoid unnecessary costs and time-consuming work, while still maintaining a certain flexibility in deciding what existing structures to demolish and which to reuse, or where and how to build new additions.

Just as Haefeli Moser Steiger had done with the partial demolition of the Tonhalle Trocadéro in the 1930s, existing piles on the site were reused wherever possible in the recent renovation project. Cases still arose where the existing structures could not bear the loads from new interventions. For example, in place of the 1980s *Panorama-saal*, the new restaurant (Fig. 4) constructed on the terrace level spanned 14.8 m over top of the existing *Gartensaal* structure (Fig. 6) to avoid overloading the *Gartensaal*'s unique '*Rohrzellen*' construction<sup>10</sup> and its existing timber pile foundations. The loads from the restaurant roof could be safely transferred down through the new hall extensions and structure flanking the existing *Gartensaal*, and then eventually transferred down to new reinforced concrete piles.

Similar intensive structural interventions were completed between *Los I* and *II* to establish a new circulation

corridor through the site, as described earlier. Existing floor slabs had to be carefully demolished with areas and edges of the existing floor slab kept with reinforcement while only the concrete itself was removed. This demolition approach ensured that new reinforcement could be adequately overlapped and joined with the existing reinforcement in a floor slab. The differences in height between the floor slabs in *Los* I and II were further resolved through the construction of ramps for accessibility purposes, while the existing mushroom column and flat slab construction (Fig. 7) of Swiss engineer Robert Maillart were preserved and respected.

### **Building endurance and *weiterbauen***

The recent 2017–2021 renovation project of the Zurich Kongresshaus and Tonhalle exemplifies a nuanced and forward-looking approach based on the concept of *weiterbauen*. This approach is equally relevant for both structural engineering and the architectural heritage of existing structures, where working with and building upon the past is not only a design strategy but a cultural responsibility. This work demonstrates how thoughtful and well-designed interventions can reconcile historical authenticity with present-day functionality, resulting in building renovations with enduring value, while also contributing to a broader discourse on sustainable and culturally-embedded architectural and engineering practice.

<sup>1</sup> ARTHUR RUEGG, RETO GADOLA (eds.), *Kongresshaus Zürich 1937–1939: Moderne Raumkultur*, Zurich, gta Verlag, 2007.

<sup>2</sup> *Kongresshaus Zürich 1937 bis 1980*, Zurich, Kongresshaus-Stiftung Zürich, 1980.

<sup>3</sup> SONJA HILDEBRAND, BRUNO MAURER, WERNER OECHSLIN (eds.), *Haefeli Moser Steiger: die Architekten der Schweizer Moderne*, Zurich, gta Verlag, 2007.

<sup>4</sup> PETER MEYER, *Das Kongresshaus in Zürich als Beispiel moderner Architektur*, «Schweizerische Bauzeitung», vol. CXXI, n. XXVI, 1943, pp. 310–313. <<http://doi.org/10.5169/seals-53117>>.

<sup>5</sup> RETO GIESER, MARTINO STIERLI, *Architecture Officielle Maudite: The Zurich Kongresshaus Between Preservation and City Marketing*, «Future Anterior», vol. IV, n. I, Summer 2007, pp. xii, 1–11. <https://www.jstor.org/stable/25834996>.

<sup>6</sup> WERNER HUBER, *Das grosse Happy End*, «Hochparterre», 2021. <<https://www.hochparterre.ch/nachrichten/architektur/blog/post/detail/das-grosse-happy-end/1630070290/>>.

<sup>7</sup> ROGER STRUB, *Weiterbauen – Denkmalpflege als Teil der Baukultur*, «ÖZKD» vol. LXXVI, n. IV, 2024, pp. 81–92. <<https://doi.org/10.1553/oezkd2022-04s81>>.

<sup>8</sup> MARTIN BOESCH, *Das Neue im Alten : zum architektonischen Umgang mit Bestehendem*, «Werk, Bauen + Wohnen», vol. CVI, n. I-II, 2019, pp. 14–19. <<https://doi.org/10.5169/seals-869635>>.

<sup>9</sup> PATRICK FLEMING, *The Concrete, Steel and Timber Foundations of the Zurich Kongresshaus (1937–39)*, in A. Tostões, Y. Yamana (eds.) *The 16th International Docomomo Conference - Inheritable Resilience*, vol. II, Tokyo, 2020, pp. 462–467. <<https://doi.org/10.3929/ethz-b-000525328>>.

<sup>10</sup> PATRICK FLEMING, *The Application of Wayss' Rohrzellendecke System in the Kongresshaus, Zurich (1937–1939)*, in J.W.P. Campbell (ed.), *Water, Doors, and Buildings: Studies in the History of Construction. The Proceedings of the Sixth Conference of the Construction History Society*, Cambridge, 2019, pp. 625–634. <<https://doi.org/10.3929/ethz-b-000400961>>.