Buchli

Visionar

The Schärer house,
Münsingen

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living

The “Buchli” – Visionary living
The Schärer house, Münsingen

A systematic approach

An icon

Visionary living

Complete renovation

When the engineer Paul Schärer, owner of USM U. Schärer Söhne AG, and the Solothurn-based architect Fritz Haller, researcher and pioneer of modular construction systems, met in the technology and progress-friendly 1960s, a creative cooperation was born that would soon make history in the Swiss architecture and design industry. Together, they developed the three building block and installation systems MINI, MIDI, MAXI as well as USM Modular Furniture Haller, which has featured in the permanent collection of the Museum of Modern Art in New York since 2001.

Schärer, who held both Mies van der Rohe and Le Corbusier in great esteem, joined the long tradition of developers who appreciated and supported modern industrial architecture. Haller therefore built the company building (1963) and office pavilion (1965) on the USM site in Münsingen, followed by the Schärer family's private residence on a steep slope with spectacular views all round. This is known by everyone as the "Buchli", short and sweet, after the property's field name.

The Schärer family completed a meticulous overall renovation of their former residence, while still maintaining the original construction principles and appearance as well as strictly complying with historic preservation guidelines. Today, the "Buchli" shines in new splendour.

The USM pavilion, 1965. To avoid having to design a new type of building for every task, Fritz Haller looked for a “general solution”. This needed to enable the step-by-step construction and expansion of small units in a manner that would allow the interior to be easily adapted in the future. The result was the birth of the USM Haller MINI construction system, which supplemented the MAXI construction system.

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“New requirements arose in conjunction with the construction of factory buildings. We were asked to provide proposals for additional infrastructures such as office buildings, design studios, canteens and apartments for caretakers as well as single-family homes for senior executives.”

1969, Fritz Haller in the Swiss construction magazine “Schweizerische Bauzeitung”

USM – responsible entrepreneurship and visionary system architecture

Ulrich Schärer established an ironmongery and metalworking company in 1885 in his birth town of Münsingen, just outside Bern, Switzerland – and called it USM. Three initials that have gained global renown. In the 1920s, with Ulrich's three sons now at the helm, USM developed into a small factory that specialised in the manufacture of espagnolette window fittings. After World War II, the successful family business focused on metalwork and sheet metal processing.

Having completed his engineering degree at the Swiss Federal Institute of Technology in Zürich (ETHZ), Paul Schärer jr. (1933–2011), grandson of USM's founder, joined the company in 1961 and guided its future direction: USM was to become an industrial company specialising in steel working. Schärer's passionate interest in architecture and design, as well as his great admiration for the work of Mies van der Rohe, Le Corbusier and Fritz Haller, an innovative Swiss architect from Solothurn who later became a professor at the University of Karlsruhe, led him to commission the latter to design a new factory and company building.

Haller met the brief perfectly and designed a modular, steel-framed construction system that could be expanded as desired and therefore grow with the company and that precisely coincided with what Schärer had envisioned.

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1 Münsingen 1920: the small factory started to manufacture window fittings.

2 Engineer Paul Schärer jr. (1933–2011).

3 The new USM offices in the pavilion with the first prototypes of USM Modular Furniture Haller.

4 The new factory (1963) and the office building's pavilion (1965) in Münsingen, built by the architect Fritz Haller.

5 "Buchli", the house designed by Fritz Haller and built in 1969 as a home for the Schärer family.

Two friends with a vision:
Paul Schärer (right) and Fritz Haller.
Photo by Oscar Wiggli, © Janine Wiggli

Fritz Haller – architect and researcher

Laurent Stalder, Georg Vrachliotis

Fritz Haller (born 23/10/1924 in Solothurn, died 15/10/2012 in Bern) was one of the most influential Swiss architects of the second half of the 20th century in the area of industrial construction. From the 1950s, he joined his fellow Solothurn architects Alfons Barth, Franz Füeg, Max Schlup and Hans Zaugg as a well-known representative of the "Solothurn School" both in Switzerland and beyond, but also enjoyed a unique position due to the broad scope of his research.

Fritz Haller's oeuvre shows an extraordinarily impressive range of buildings and projects: residential and office buildings as well as large-scale industrial warehouses and machine factories. His earlier work included several schools, such as the primary school in Wasgenring (1951–1954), the Baden cantonal school (1962–1964) and the higher technical college in Brugg-Windisch (1964–1966). These gained him respect within international architectural discourse from an early stage in his career. With the world becoming increasingly influenced by technical miniaturisation processes, Haller focused on a complex array of issues, ranging from experimenting with geometric models in the early 1960s and designing the modular building block and installation systems USM MINI, MIDI, and MAXI as well as the now internationally renowned USM furniture system to creating entire city models and developing planning software in the mid-1990s.

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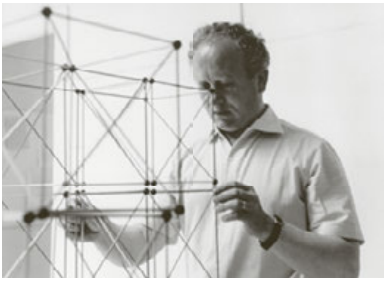


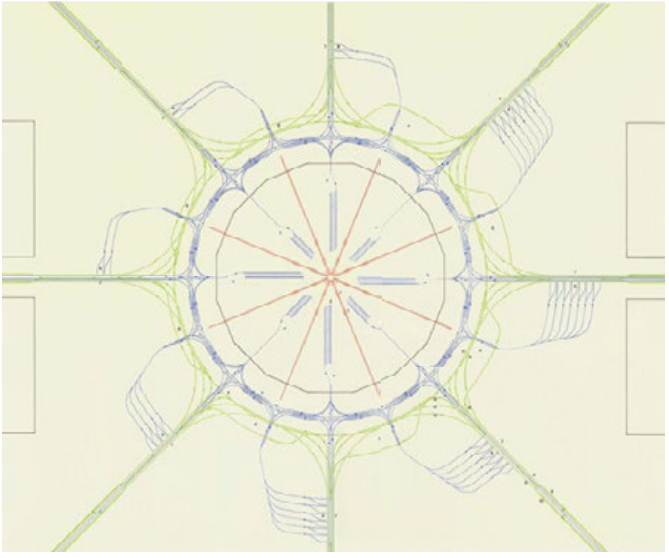
1 Fritz Haller.

2 SBB training centre, Löwenberg, Murten, 1982.

3 USM Haller MAXI steel construction system, Münsingen, 1963.

4 T-Bahn (carrier railway), plans for a passenger transportation system, research project, 1975.

5 Higher technical college, Brugg-Windisch, 1966.



Steel construction systems for versatile and efficient architectures

The partnership between USM and Fritz Haller led to the creation of three modular systems produced by USM until 1994 and sold under the brand names steel construction system USM Haller MINI, MIDI and MAXI.

MAXI was a modular system for the construction of extremely long/wide, single-storey warehouses. The supporting structure of columns and trusses could be horizontally extended in any direction. The façade elements were interchangeable, enabling windows, doors and other elements to be tailored to customer requirements at any time. The MAXI system was primarily used to create production facilities that needed to be easy to convert and extend.

MIDI was particularly ideal for the construction of two-storey industrialised buildings in which the geometric arrangement of the pipework for the building engineering systems formed part of the overall system. MIDI was used for school and office buildings, laboratories and hospitals.

MINI was based on the same systematic structure as the other two systems. The supporting structure, which consisted of columns a maximum of 8.4 metres apart and beams, could be expanded horizontally as desired; all parts of the outer skin were detachable and could be replaced within the modular system's framework. MINI was used to construct one to two-storey buildings such as houses or design studios, office and school pavilions, laboratories, sales and exhibition pavilions and concourses. Short build times and the ability to quickly and easily convert or extend structures as well as to dismantle and reinstall them in a different location were among the key benefits of this system.

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1 Peichär print shop, built using the USM Haller MAXI steel construction system, Saalfelden, Austria, 1967.

2 The Hafter house, built using the USM Haller MINI steel construction system.

3 USM Haller MAXI.

4 USM Haller MINI.

5 Beam installation, USM Haller MAXI.

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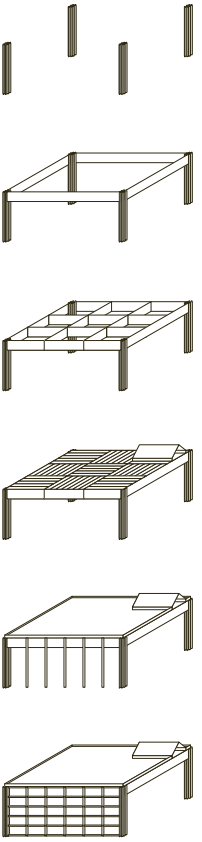

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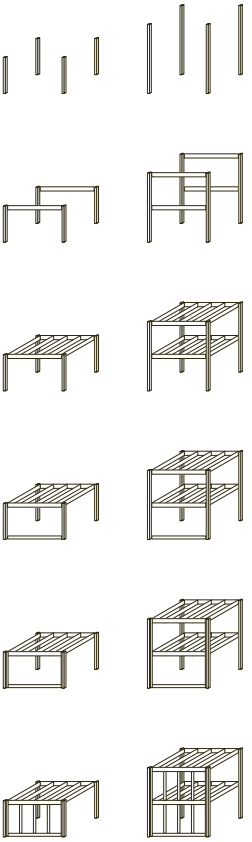
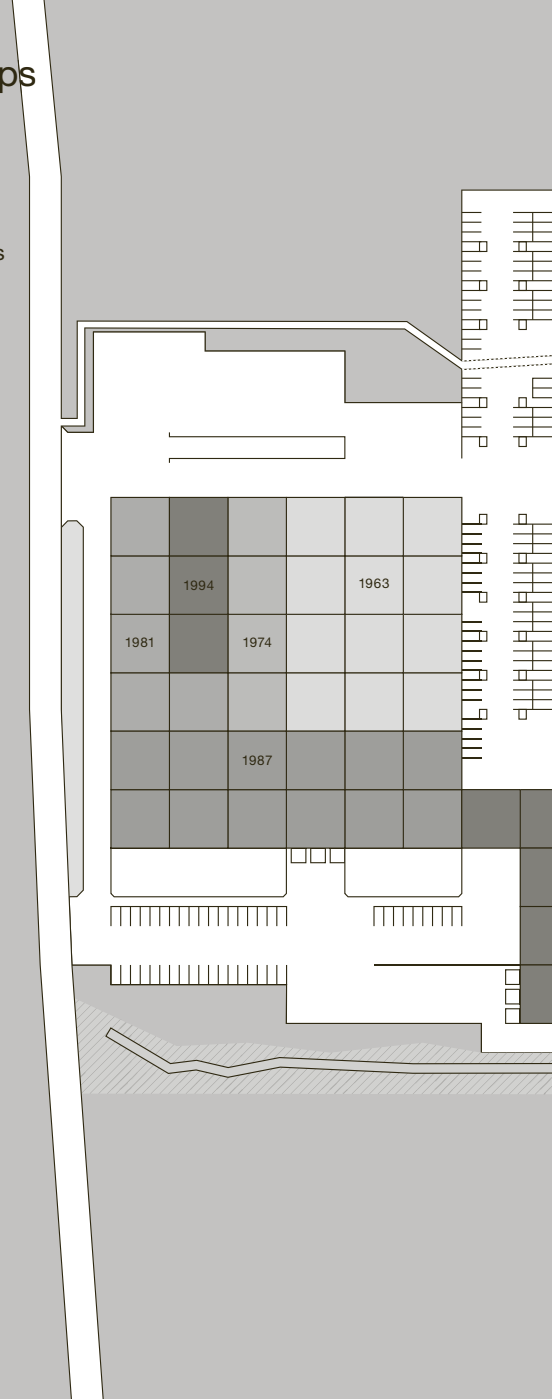


Growth in responsible steps

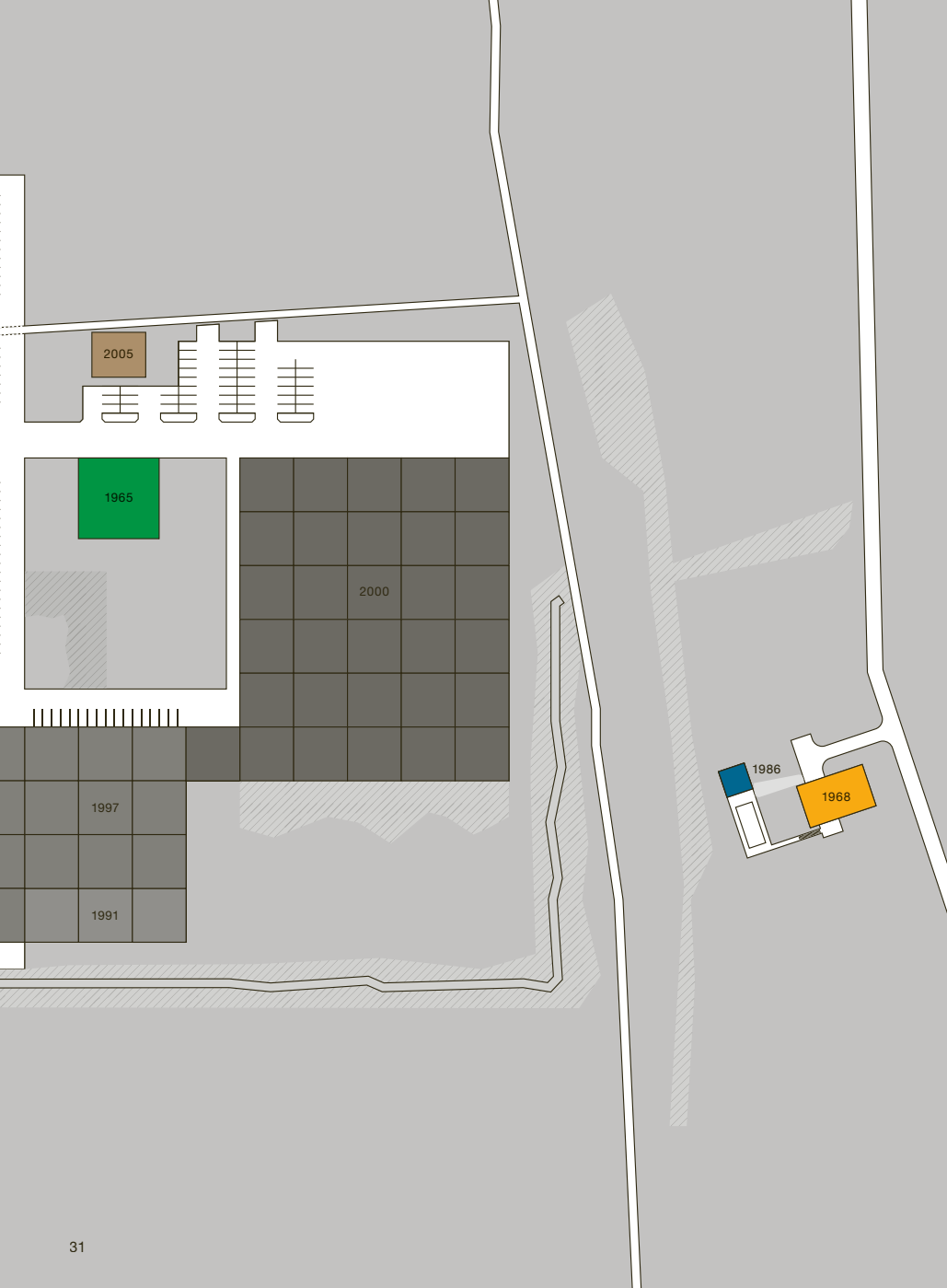
The USM Haller construction systems made it possible to expand the company's manufacturing and office buildings in accountable and responsible steps.

The area developed using the USM Haller MAXI system (grey) has been expanded from 2,544 to 18,648 square metres in seven stages since 1963.

The "Buchli" sits atop a small rise overlooking the company site.



- Manufacturing building built using USM Haller MAXI, created in 8 steps.
- Office pavilion built using USM Haller MINI, currently used for official events.
- Pavilion for Roman mosaics, built using USM Haller MINI.
- "Buchli" house, built using USM Haller MINI.
- Pool house, built using USM Haller MINI-MINI.


2005
1965
2000
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Living in a modular construction system – the Schärer house was Fritz Haller's first residential project to be based on a prefabrication system. Located on a slope, the living space rests on stilts. Glass panels between these create an all-round impression of transparency and lightness.

An icon

“The Schärer house is a key work in Fritz Haller’s oeuvre. It reflects the entire spectrum of questions covered by his work, which ranges from basic geometric research to furniture construction, modular construction systems and the planning of global city models.”

Prof. Dr. Laurent Stalder, ETH Zurich
Prof. Dr. Georg Vrachliotis, KIT, Karlsruhe

A pioneering home

The Schärer house in Münsingen, 1968–1969, 1984–1986

Laurent Stalder, Georg Vrachliotis

Solothurn-based architect Fritz Haller designed the Schärer house for Paul Ulrich Schärer, then owner of USM U. Schärer Söhne AG, in 1968 using the USM Haller MINI steel construction system. The house is located on a steep slope overlooking the company site. Positioned parallel to the slope, the rooms on the top floor of the house face the Aare river basin and open up in all directions. The house is accessed from above, with the driveway leading from the road to the covered parking area on the ground floor.

The house is built on a support grid following a 1:2.5:1:2.5:1 rhythm. On the ground floor, the middle axis serves as the entrance hall with a metal spiral staircase that leads up to the first floor, which is elevated atop columns. The basement houses an office and a guest room. On the first floor, the central installation and circulation area borders onto the kitchen and three north-east-facing bedrooms with en-suite bathrooms. Extending to the south-west across the whole width of the building is the spacious open-plan living/dining area with a balcony that offers views of the valley. The outer axis also forms a balcony at the back.

The built-in cabinets and central kitchen units were designed by Haller; even the free-standing fireplace fits into the grid, just like the rest of the interior features, which were mainly built using the USM Haller modular furniture system. The tall, narrow, rectangular windows with a width of just 1.20 metres play a major part in shaping the building's overall external appearance.

The single-storey garden and bathing pavilion built in 1986 using the MINI-MINI steel construction system follows the same grid as the house and the property. The floor plan uses a square design comprising 6 × 6 grid units and is half open, creating a covered terrace in front of the pool.

In designing the Schärer residence, the architectural challenges, in terms of both the area and construction, lay in dealing with the uneven ground and the "extremely complicated terrain", as Fritz Haller wrote in 1978. Haller devised the ingenious solution of putting the upper level on stilts. Both the construction system's impressive versatility and the interpretive freedom when architecturally managing the system add to the impression of transparency and ease.

The short description of the Schärer house is a slightly modified version of the text "Haus Schärer" in the Haller monograph: Laurent Stalder and Georg Vrachliotis (eds.): *Fritz Haller. Architekt und Forscher,* Zurich: gta Verlag 2015, p. 294–295.

1 View from the access road, 1970s.

2 Original plan from 1968;
all rooms and fixtures follow
a basic 1.2 × 1.2 m grid.

3 The kitchen opens up into the living
area, 1969.

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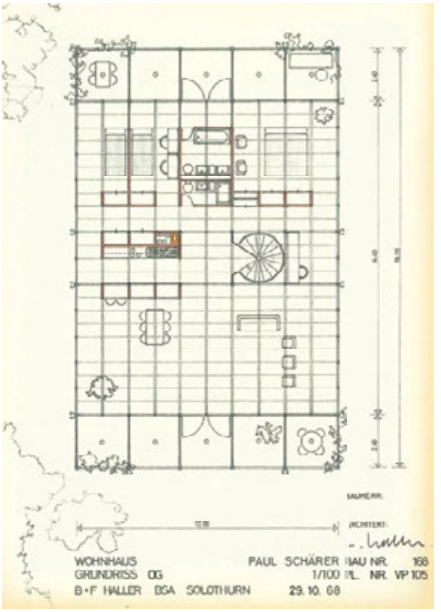

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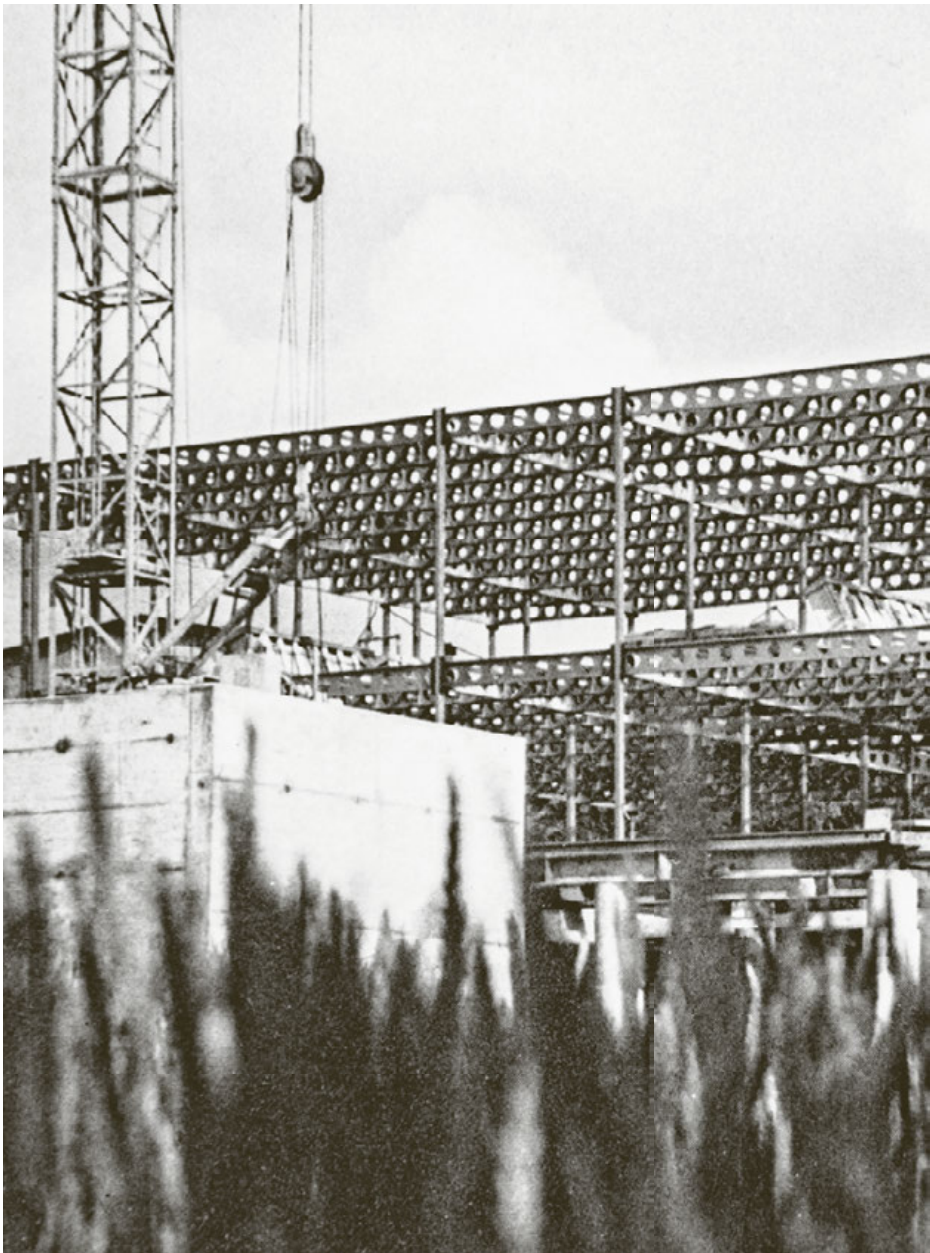
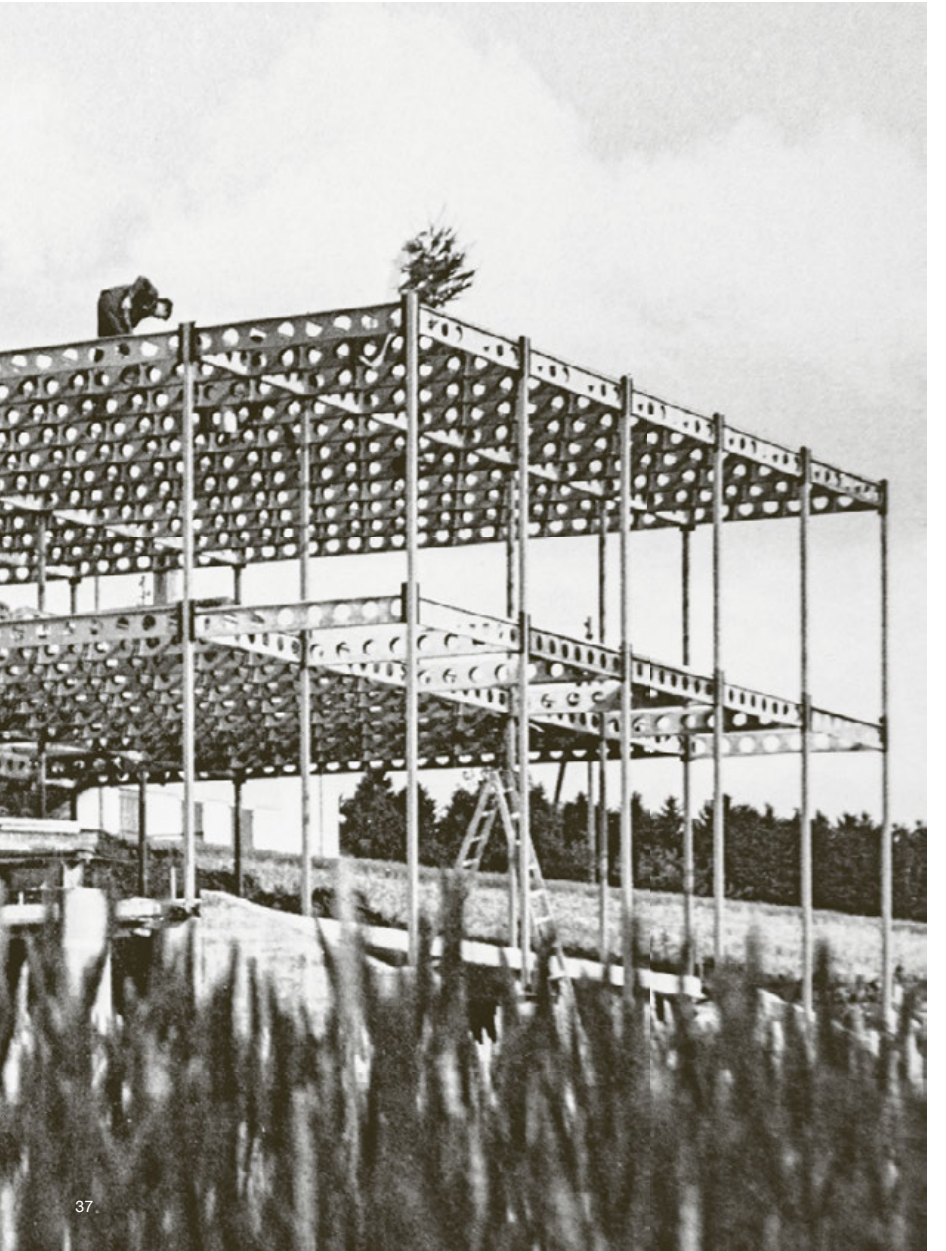
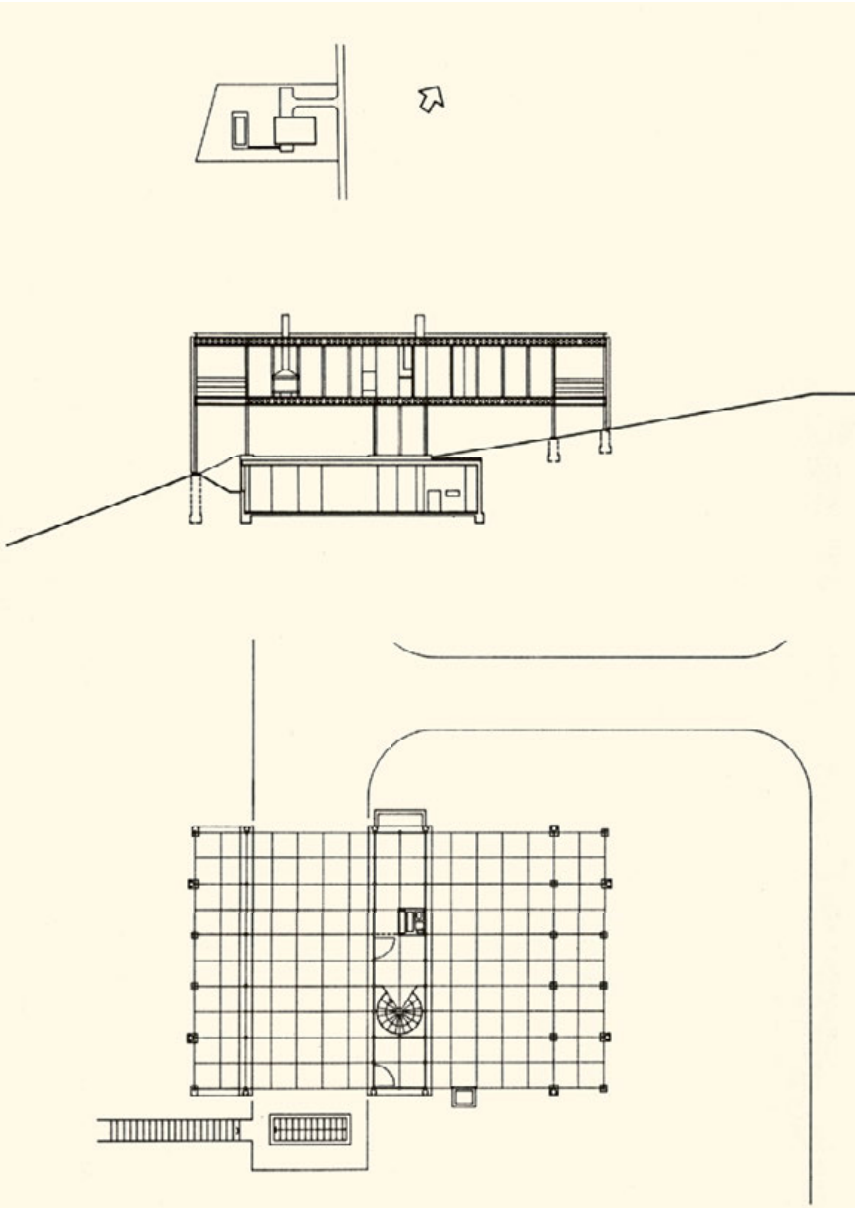


The prefabricated steel structure was erected just two weeks into the build. Topping-out ceremony, 1969.

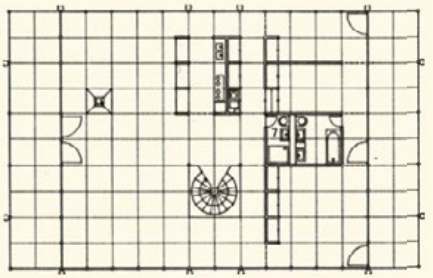


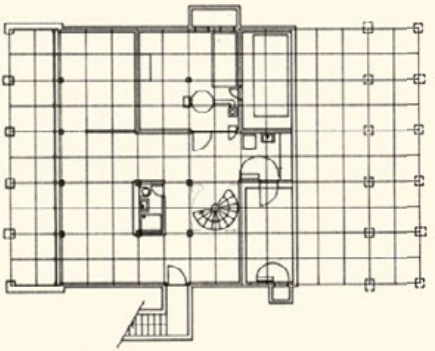
The architect and the building owner shortly after completion, 1969.

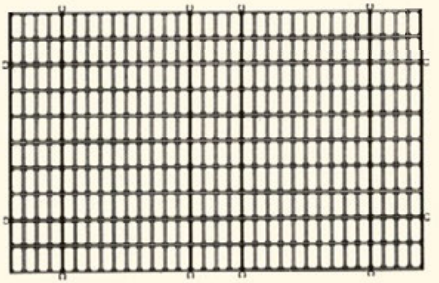
View from the access road shortly after completion. Autumn 1969.

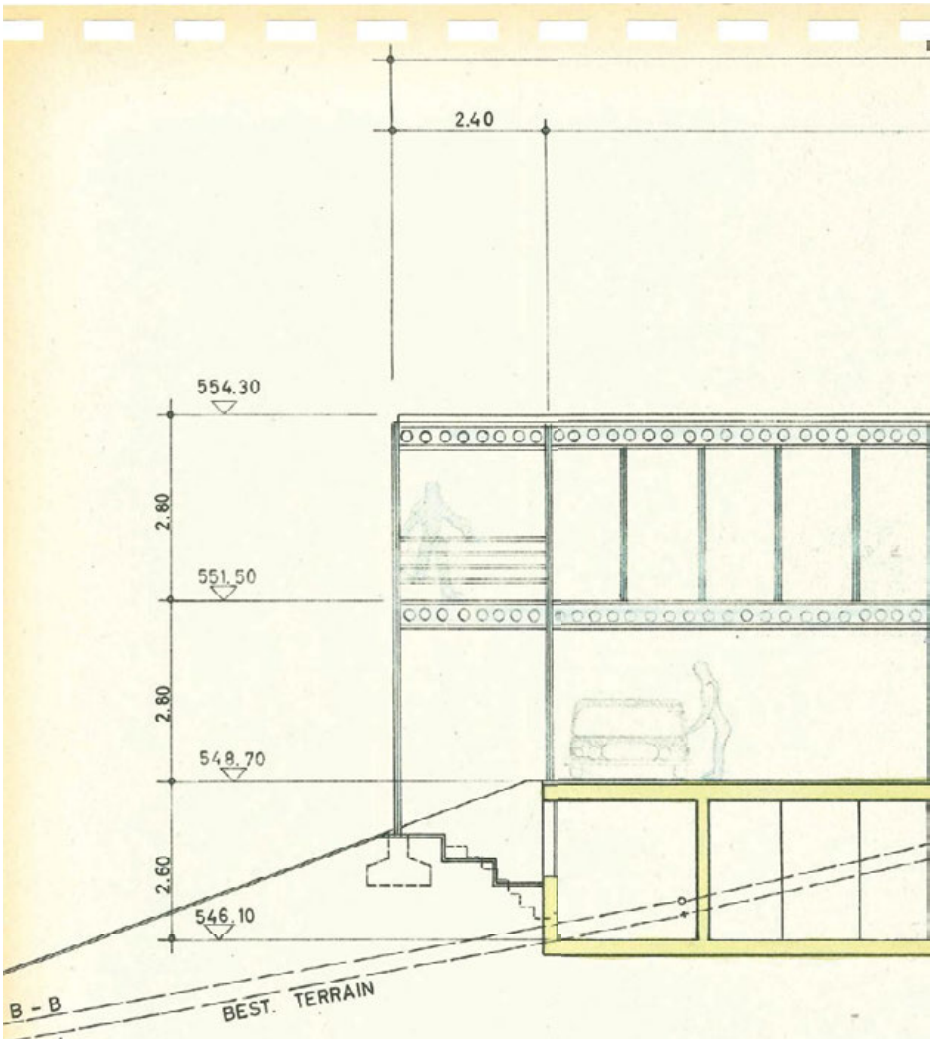


Floor plans, sectional view, situation and support structure, 1969.









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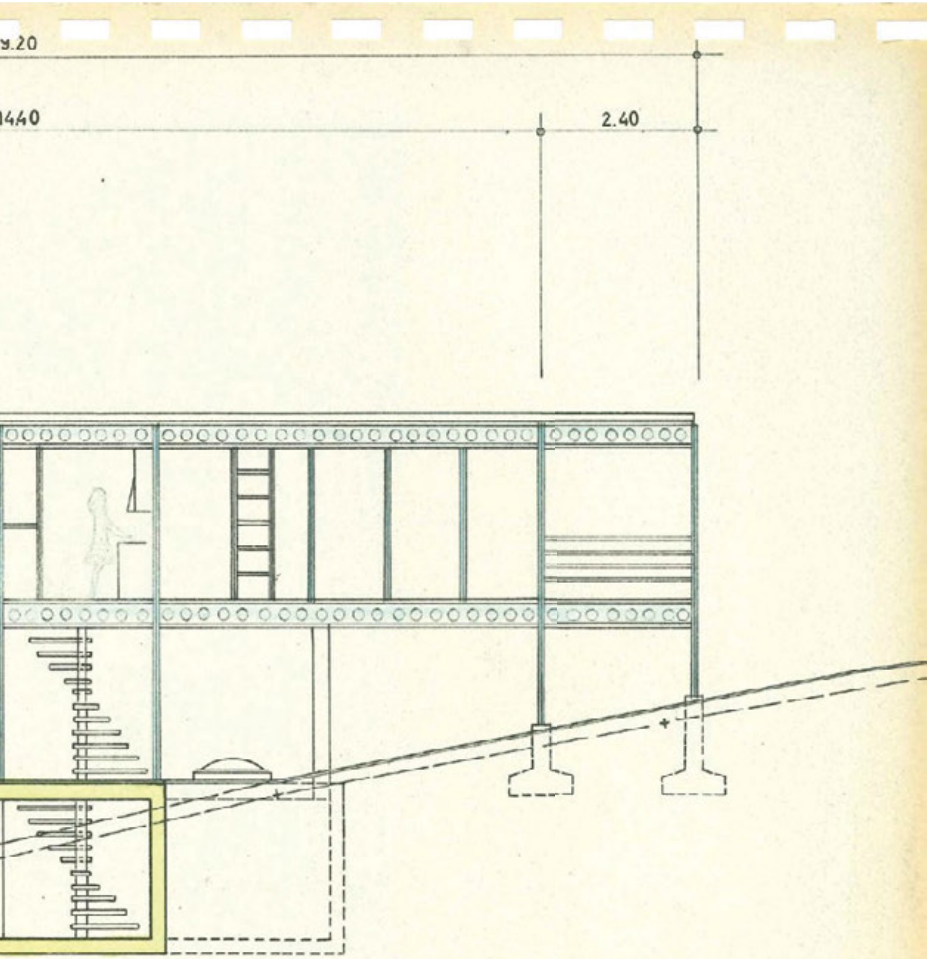
Fritz Haller's original plan, 1968.



HAUS PAUL SCHÄRER BAU NR. 168
SCHNITT 1:100 PL. NR. VP106
HALLER BSA SOLOTHURN 29.10.68

The kitchen opens up into the living area, 1969

Vision living

ary

“Wide-ranging views all around. And behind the Alps, the sea – this knowledge fascinated me as a child. But even with these amazing views, I could still sense an ambivalent tension between distance and proximity, between the mountains that you could see in the distance and the sea that you could only imagine. It became increasingly clear to me that you first have to get over the mountains before you can reach the sea.”

Alexander Schärer, CEO, USM Group

Function = system × beauty

Jürg Graser

In the post-war period, many industrialists commissioned renowned architects to build factories for them. In commissioning the USM Münsingen plant inaugurated in 1963, Paul Schärer joined the long tradition of building owners who appreciated and supported modern industrial architecture. The next logical step in 1965 was therefore to expand the company building to include an office pavilion. This pavilion not only housed the production facility but also offices, in which the latest business administration practices were used. The house above the company premises, which Paul Schärer moved into with his family in 1969, was also simply extraordinary. Solothurn-based architect and system pioneer Fritz Haller was responsible for the planning and implementation of all work. By commissioning Haller to build not only his factory and office but also his private residence, Paul Schärer demonstrated his desire for Haller's construction method, at the time new in every regard, to shape even his family life.

"New" meant living in a steel construction made with elements from the USM MINI system with glass infills instead of any conventional separation into living and bedroom areas, with no rooms with doors and with no windows that could be opened. Although this may not seem particularly spectacular by today's standards considering the many different styles of homes and forms of living, but in the early 1970s, it was a bold move.

The comparison with the country manor built in Solothurn in 1945 (also for a factory owner) by Professor William Dunkel clearly highlights stark differences. On the ground level, you will find the entrance hall as well as the cloakroom, living room and boudoir, which serves as the hinge to social life within the building. In the single-storey northern wing of the building is the study, which is directly connected to the horse stable. The stable and kitchen have servant access from the outside (without having to bother the owners). On the first floor, you will find the usual bedrooms and bathrooms as well as two maid's rooms.

Although it was built only 25 years later, the Schärer residence illustrates the radical change to the social and architectural ideals of the post-war era. Family life took place on the large, 12 × 14.4 metre platform atop multiple columns with two terraces at the front, a minimal number of bedrooms and just two bathrooms. The space provides hardly any privacy as it is both open-plan within and open to the outside; this made family life a little different, or should we say more challenging.

Blueprints for modern living

The exponential economic growth after World War II released people in the western world from hard physical labour, and the rise of mechanisation in everyday life brought them wealth like never before. For the younger generation, the Case Study House programme by the publisher John Entenza served as a blueprint for the perfect way to live. The husband drives to work at the office first thing, the wife spends the morning doing the housework then looks

after the two children in the afternoon. On weekends, friends come over for a barbecue by the pool. Photographer Julius Shulman's glossy prints in the *arts & architecture* magazine acted as a projection screen for small families with a desire for individuality and self-actualisation, also in Europe. In the 1950s, new districts of single-family homes for the middle class, who were able to afford a detached house and thus conventionalised such homes as the perfect way of living, sprung up all over the country.

At home with steel

Building detached houses from steel is unusual, even today. With its beautifully intricate ornaments, the *Hôtel Tassel* by Victor Horta in Brussels (1892/93) is an art nouveau masterpiece. The mansion's programme and features mirror the Belgian bourgeoisie of the late 19th century, whereas the construction, space and steel ornaments point far into the 20th century. Even today, the word *Differdinger* (named after a steel mill in the eponymous Luxembourg border town) is still used in the construction industry as a synonym for medium steel beams.

Although completely different from an architectural perspective yet still just as unique and personalised, the *Maison de verre* by Pierre Chareau and Bernard Bijvoet in Paris (1928–1931) embodies the prototypical, formal staging of new types of expression created by steel when building private homes. It is constructed using standardised rolled steel profiles, and despite using industrial mass-market products, the house is a uniquely designed masterpiece down to the last screw. Wedged under the huge, existing courtyard building, it combines the private and professional spaces of a doctor and his family within a two-storey spatial composition that continues to impress even today.

The third icon, the *Case Study House CSH #8* by Charles and Ray Eames in Pacific Palisades, California (1949), took the social reorientation after World War II as a springboard for rethinking home living. In a playful collage, the Eames couple transformed unspectacular semi-finished products from the construction industry into an exciting spatial structure that perfectly reflects the post-war generation's needs and optimistic attitude towards life.

Treacherous transparencies

Probably the best-known steel and glass house is Edith Farnsworth's weekend retreat in Plano, Illinois, built in 1951 by Ludwig Mies van der Rohe. While the usability of the building is still the subject of heated debate, its technical and aesthetic perfection continues to result in major intrigue. The Farnsworth House remains an unparalleled ideal as the architect used the resources of his time to find a completely new and universally accepted architectural expression for the house's construction programme.

Systematic thinking

Fritz Haller developed his construction concepts amidst the belief in progress and technology of the second half of the 20th century. The “Solothurn School” is regarded as Switzerland’s contribution to the international steel and glass architecture of this period. Haller spent entire nights on the telephone to Franz Füeg discussing quantum physics, found an incorruptible critic in Alfons Barth and maintained amicable discourse with Hans Zaugg and Max Schlup, which helped him overcome obstacles and failures. Haller’s contribution to the Solothurn School aimed at systemising construction, from small standards for furniture, buildings and cities right through to cosmic standards for the universe.
In his work, he always focused on people, but also never lost sight of the fair and thus economical use of resources.

The great theorist of systematic construction, Konrad Wachsmann, was unable to make any steel construction projects a reality. This was not the case for Fritz Haller. Together with Paul Schärer, he developed the world-famous modular furniture system, but also the three steel construction systems USM Haller MINI, MIDI and MAXI, which he (and all interested architects) used to deliver successful projects.

The Schärer house was the first private residence built using the USM Haller MINI steel construction system and acted as a prototype for all further uses of the system. Fritz Haller also designed and built several other MINI houses, specifically the Hafter house in Solothurn (1976/77), the Piguet house in Lostorf (1967/68), and the Fässler house in Mörigen (1970/71). Alone, the fact that the Schärer house is one of only four originals demonstrates its historical value from an architectural perspective. The spatial construction system MINI perfectly proves its abilities and, without Haller mentioning this, meets the highest aesthetic demands.

The subheadings are excerpts from the following publications. They serve as both recommended reading and reference literature:

Elisabeth A. T. Smith, *Blueprints for Modern Living,* Cambridge MA 1999.

Zurich University of Applied Sciences, *Zuhause im Stahl (At home with steel)*, Zurich 2016.

Jacques Herzog, Pierre de Meuron, *Treacherous Transparencies,* New York 2016.

Jürg Graser, *Denken in Systemen (Systematic thinking)* in the magazine *Werk, Bauen + Wohnen,* issue no. 5, 2010, p. 30–35.

1 The *Case Study House CSH #8* by Charles and Ray Eames in Pacific Palisades, California (1949), took the social reorientation after World War II as a springboard for rethinking home living.
Photo by Stephanie Braconnier

2 The *Maison de verre* by Pierre Chareau and Bernard Bijvoet in Paris (1928–1931) embodies the prototypical, formal staging of new types of expression created by steel when building private homes.
Photo by B. O'Kane

3 Probably the best-known steel and glass house is Edith Farnsworth's weekend retreat in Plano, Illinois (1951), by Ludwig Mies van der Rohe.
Photo by Hedrich Blessing

The Schärer house
in autumn, late 1970s.
Photo by Susana Bruell

The trouble with seating
Notes on furniture

Arthur Rüegg

The Schärer house is a show home for "living within a system". As is to be expected, prefabrication plays a key role here – even in the interior. The basic construction rhythm of the strictly zoned floor plan is accentuated by the window panels, modular cabinet elements and colourful glass sliding doors. Based on a square grid, the construction system creates an open, usage-neutral space featuring a fireplace suspended from the ceiling that beautifully compliments the equally asymmetrical spiral staircase and is the only sculptural feature. The floor, covered in grey needle felt, is a trademark feature that can not only be found in this airy factory villa but also in the spatially similar and also prefabricated USM U. Schärer Söhne AG office building. This may be one of the few instances in which the two worlds of life and work have been consistently aligned.

And the furniture? For Fritz Haller and Paul Schärer, working on the modular construction systems triggered an intensive search for fitting office furniture. The two postulated that the role of the pallets in the company building should now be taken on by the letter trays in the analogically constructed office building. Subject to time pressures, they produced a pilot series with components from the trade – on the one hand, the stackable wooden boxes for storing hanging files with a base frame, which, on a larger scale, served as a desk, and steel frames with document drawers on the other. The elegant metal-frame tables of this pilot series are still manufactured today; in the Schärer house, they were used as dining tables. The truly ingenious idea only came later though – according to Haller, "something that we didn't even expect or think of". Inspired by the *Abstracta* storage racks of Danish origin used by the company, an open building block designed according to the principle of skeleton construction was created in multiple steps. This included interlinked supporting frames, coverings, additional fittings and all accessories. The result was the key to building office landscapes as they are known across the world today, which, just like the prefabricated buildings, can be disassembled and reconfigured at any time. In the Schärer house, the storage furniture created using the USM Haller building blocks acts like mini architectural features, which intentionally provide a direct reference to the house's owners – and to the late-modern system concept as a whole.

For years, Haller himself strived for chair and table furniture that, like the storage furniture, would follow the same architectural concept as his buildings. The chairs for the Wasgenring school building in Basel (1951–1955) pre-empted the concept of the Weststadt school building, which was built four years later in Solothurn. Here, the cubic classroom block no longer rests on the ground, but instead seems to hover above an open ground floor, while the tables and chairs use another modern topos, the "cantilever principle". When, a few years later, Haller shifted his interest from creating site-specific structures to developing steel construction systems, he seemed to realise the futility of certain experiments. It was no coincidence that he began using the

1 View of the living area from the dining room. Front: *sofa* and *Fauteuils Grand Confort;* Back: *Sofa RH 306*.

2 Measurement plans of the Schärer house with furniture, 1994.
Drawing by Bruno Krucker, Professorship Rüegg, ETH Zurich

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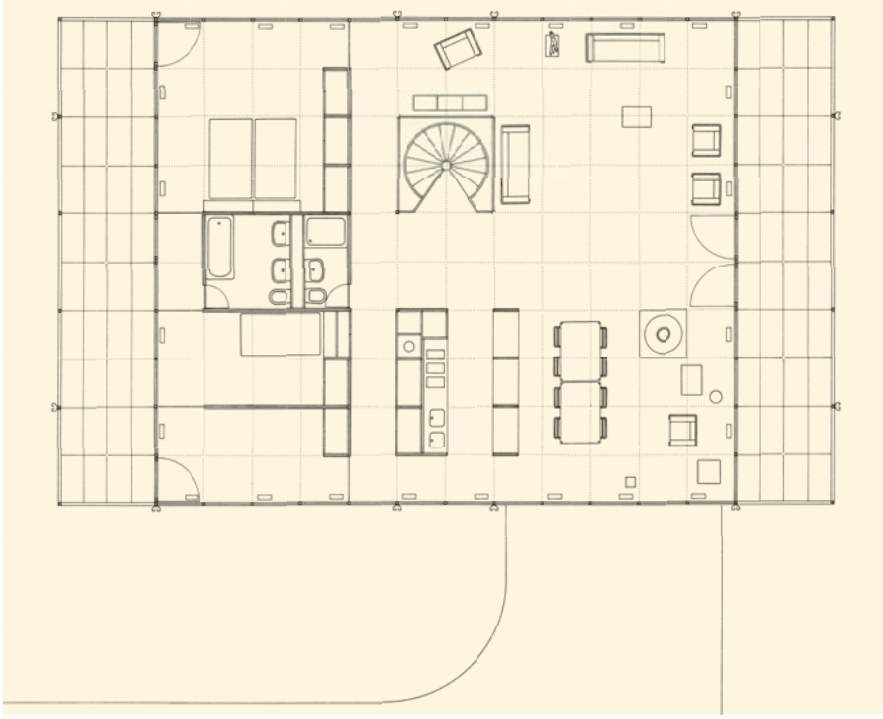

future classics from the Knoll or Herman Miller product lines for his office buildings, which also reflect a fascination in the form-generation possibilities offered by the latest technologies. We do not know why these exciting polymorphic objects were not used in the Schärer house.

A few years earlier, a group of young Swiss designers had already started looking for the aesthetically valid modern form. During the economic boom, the Puritan style of the immediate post-war period increasingly gave way to the tendency for classicism, elegance and representation that had already been hinted at in the early work of Ludwig Mies van der Rohe and now also began to shape the Solothurn School. At the time, inspired entrepreneurs seized the opportunity to offer long sold-out furniture icons of the interwar era in the form of re-editions. In contrast, Hans Eichenberger, Robert Haussmann and Kurt Thut took a more critical look at the renowned idols and came up with their own designs between 1956 and 1958. Haussman started by looking at the *Barcelona Chair* by Mies van der Rohe, then at the *Fauteuil Gran Confort* by Le Corbusier/Jeanneret/Perriand. In both cases, he came up with his own designs for which the principle of simple disassembly was of great importance. Eichenberger attempted to create a synthesis between various models, whereas Thut did not follow any specific idols. Instead, he limited himself to a set of flat bars, spacers and screws for the easy-to-follow construction of his form-strict cabinet pieces – very much in the spirit of "a steel construction as used by Mies van der Rohe". While it is obvious that neither Haller nor Schärer acquired a taste for the aesthetically and constructively similar fauteuils in the "Swiss Design" collection, Robert Haussmann's *Expo-Sofa RH 306* from 1963/64 – a markedly cubic version of the classic chesterfield sofa – became a firm feature in living rooms.

Could the two have set the bar higher from the very beginning? Apart from the *RH 306,* there are no other derivations in the Schärer house, but rather the archetypes of modern seating furniture: the Mart Stam cantilever chair at the dining table and – even drawn onto the project plans – the *Fauteuil Grand Confort* by Le Corbusier/Jeanneret/Perriand in the living area. The cantilever chair transformed the "functional" chair into its simplest form in 1927. Instead of "unhygienic" spring upholstery, the frame itself provides the suspension. But for Stam, it was also about the most elementary expression of a phenomenon that was the sensation of the time: "cantilevering" was propagated as the antithesis to the ground contact of traditional buildings and furniture, thus as the key feature of a new era.

In contrast, the *Fauteuil Grand Confort* is not an "invention" but still the closest formulation of traditional upholstery furniture: it is reduced to a "panier à coussins" made from a steel tube cage that houses spring upholstery and four down cushions. The standardisation of constructive details to enable mass production, seen to a certain extent in the case of the cantilever chair, was not a topic whatsoever when it came to the *Fauteuil Grand Confort.* This is a tremendous piece of metalwork with delicate

welded connections on the seat frame and a steel tubular cage created by connecting narrow flue tube bends. As a whole, therefore, the antithesis to everything that Haller and Schärer tried to achieve in the 1960s.

It almost seems as though the pictorial embodiment of comfortable seating washed away all of their construction-related reservations. Pictorial rhetoric as the primary goal of design? The visually memorable USM Modular Furniture Haller is also among the rare consumer goods to have not only achieved the ideal cult status but also a legally attested artistic value.

1 Robert Haussmann, *Fauteuil RH 301,* 1954, based on the Barcelona Chair by Ludwig Mies van der Rohe.
Photo by Fred Waldvogel

2 Le Corbusier, Pierre Jeanneret, Charlotte Perriand, frame of a *Fauteuil Grand Confort* from 1929.
Photo by Franz Xaver Jaggy

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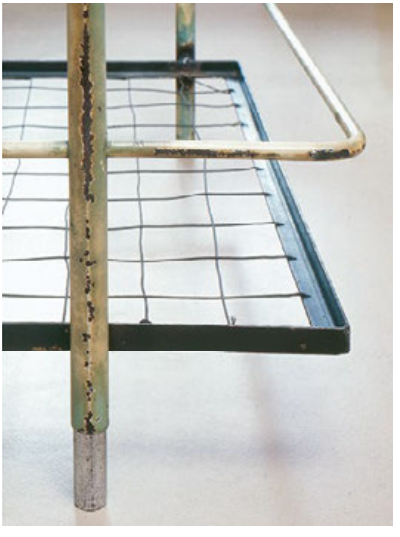


USM

View into Paul Schärer's office on the lower level, 1970s, with works by his contemporaries Oscar Wiggli and Jean Tinguely.

Comple
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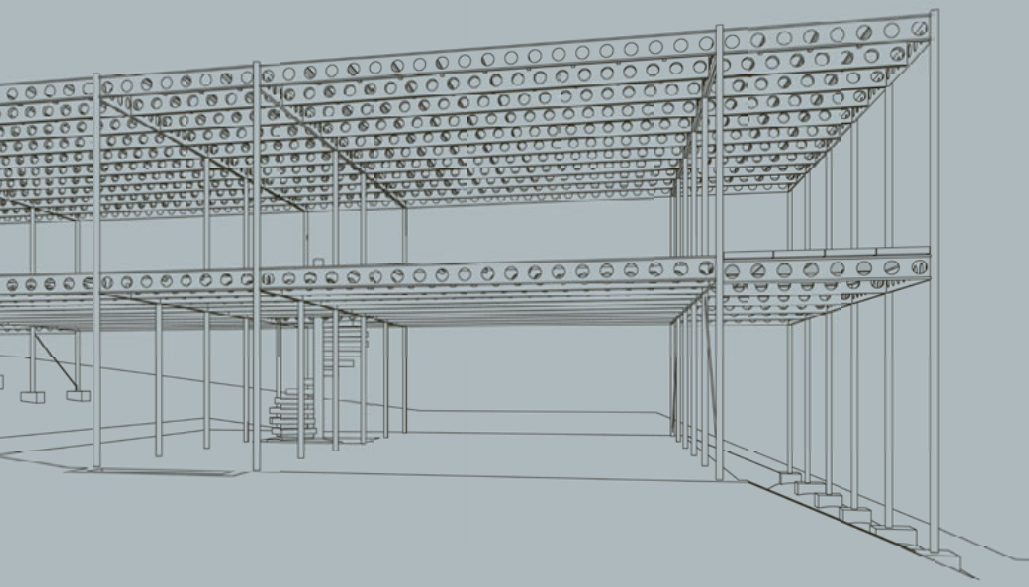

te
ovation

“The aim was to renovate the Schärer house while maintaining as much of the original structure’s value and character as possible. This would ultimately secure the most important witness to the company’s history – for decades to come.”

Philippe Castellan, architect

A journey through time

The complete renovation of the Schärer house, Münsingen, 2015–2019

Philippe Castellan

Starting point

Until the early 2000s, the Schärer house, Buchliweg 30, Münsingen, was used as a private residence and later as an office building. With the exception of a few minor renovations, the building remains in its original state.

Since then, maintenance work has primarily focused on painting the exterior (corrosion protection). The building technology has been maintained in so far as possible and continues to be used. However, the building envelope (driveway on the flat roof) and interior, especially in the bathrooms, have suffered visible damage over the years.

Surveys

Steelwork
Several areas of damage to the steelwork (corrosion) were revealed during the excavation work performed due to the originally planned renovations to both the interior (surface refurbishing and restoration, interior construction and replacement of building technology) and the exterior (sewer system, water inlet on the driveway, pool). Some of the damage was so severe and extensive that it was not possible to renovate the steelwork on site (due to the scale of the damage, system and design-induced reasons, accessibility, controls etc.).

Interior
Pollutant measurements in the interior furthermore indicated high formaldehyde readings above the limit set by the Swiss Federal Office for Health. Emission measurements showed that the chipboard panels in the floor structure (supporting structure) were likely to be the main source of the high formaldehyde content in the air. However, lab tests on the chipboard panels within the rest of the interior also indicated a high formaldehyde content.

Renovation brief

After a thorough examination, the developer and planning team decided to temporarily disassemble the modular USM Haller MINI steel structure right down to the ground floor base plate, take each of the pieces to a workshop for processing, restoration or, if necessary, recreation in original format, and then to re-erect the MINI steel structure. The aim was to renovate the Schärer house while maintaining as much of the original structure's value and character as possible. This would ultimately secure the most important witness to the company's history – for decades to come.

The challenges faced included:
– minimising system-induced constructional vulnerabilities (thermal bridging/corrosion)
– restoring worn components to their original condition and design
– dealing with contaminated structures (interior construction)
– restoring lost elements
– improving the internal climate (summer/winter)
– reducing the energy consumption

Renovation description – façade

Steelwork
The characteristically elegant and classic appearance of the building created using the MINI steel construction system is based, among other things, on the visual reduction of the supporting structure and glass together with the fact that the supporting structure (columns) is directly in line with the façade, i.e. forms part of the façade itself; the interior and the exterior are identical.

Due to the extensive damage (material thickness corroded by up to 50% in places), many of the vertical elements like the columns and façade mullions had to be replaced. The external wind protection elements and all horizontal system components, including the main beams and box beams, were all refurbished and reinstalled. The edge sheets located within the façade surface and the roof edge were replaced. To prevent future corrosion damage (overlapping the supporting structure and façade surface causes system-induced thermal bridging), the façade mullions and edge sheets were newly designed in chrome-nickel steel. An additional insulation box was also installed on the inner edges by the edge sheets (floor and ceiling construction). The retrospectively installed second layer of main beams – visibly attached to the ceiling above the driveway and rock garden – could be removed based on static calculations and the integration of new reinforcements for the column footings and foundations.

Glass
Another central feature of the MINI steel construction design is the delicate glazing system. The slightly conical rubber profile (EPDM) is directly attached to the steelwork and forms minimalistic window frames. Despite reducing the feasible glass thickness to a mere about 21–22 mm, deviating from this system-typical and characteristic component was not an option. New krypton double-glazed insulating glass units with a U value of 1.2 W/m^{2}K were therefore installed.

Renovation description – interior

The interior of the living area (upper floor) is characterised by a completely open floor plan, which can be divided into separate areas via colourful glass sliding doors. The floor-to-ceiling element walls and built-in cabinets, which abut the false ceiling (ceiling panels), divide the living area into private rooms, service areas, kitchen/dining areas and living areas. Laboratory tests of the result of painting all of the original chipboard panels have shown that the combination of optimally sealing in the formaldehyde

1 June 2018: Longitudinal box beams are mounted on the transversal main beams.

2 July 2018: Prefabricated reinforced concrete elements – covering the main beam – make up the balcony floor (upper floor).

3 August 2018: Intersection between supports, main beam and box beam, covered by the profiled roof sheet.

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1 November 2018: The glass makes the building weatherproof.

2 January 2019: The building technology is being installed (heating/ air ducts over the upper floor).

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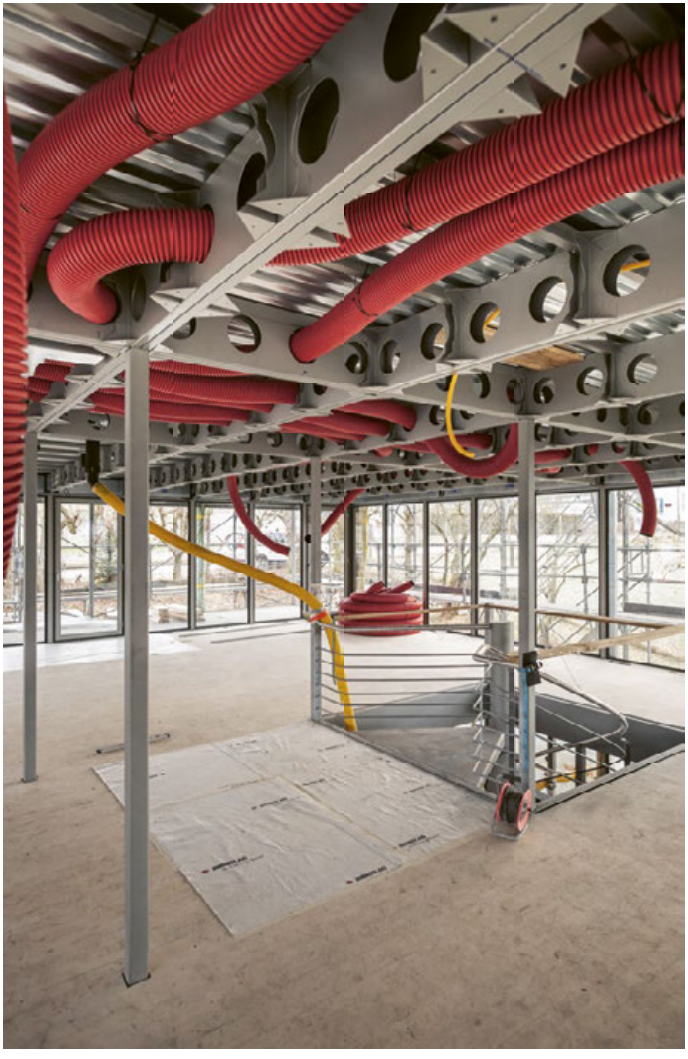

and the constant air exchange induced by the air heating/conditioning system makes it possible to preserve the original interior construction. The entire interior construction, including the original Therma kitchen and bathroom fittings and fixtures, could therefore be restored and reinstalled. The only difference was that waterproof MDF panels were used for the bathroom walls. The chipboard panel flooring (subfloor) highly contaminated with formaldehyde was replaced with a multi-layer board. The Kugelgarn wool carpet on all levels plus the floor coverings in the kitchen ("Pirelli" rubber) and bathrooms ("Pirelli" rubber/stoneware tiles) were replaced one-to-one. The original open fireplace, which was removed in the 1990s, was reconstructed and reinstalled based on pictures and descriptions from the developers (detailed plans are not available).

Technical installations/energy

The groundwater spring on the company premises delivers energy for a heat pump and an air heating/conditioning system. All technical installations were optimised and replaced based on the existing concept for heating, ventilation, air conditioning, sanitation and electronics. Thanks to today's higher-performance technology and the improved building insulation values (glazing, roof insulation and newly created perimeter insulation), the existing secondary oil-heating unit and retrospectively installed heating unit on the lower floor could be removed without replacement.

Renovation description – pool/bathing pavilion and surroundings

Pool and bathing pavilion
The pool and the bathing pavilion, which are located below the house, were included in the project's original design and the planning application dated 29/10/1968. The pool – a reinforced concrete tub clad with tiles and laid into the terrain – was built at the same time as the house. Surrounded by concrete slabs in a 1.20-metre grid, the pool's design is based on the MINI grid. The bathing pavilion was constructed in 1986 using the MINI-MINI steel construction system and has rounded off the structure's overall appearance ever since. The pool was already re-tiled in 2007 but further leaks and areas of damage to the tub's surface led to a need for further renovation. A new stainless steel tub was inserted into the existing reinforced concrete one. The tub has the same dimensions and joint pattern as the existing structure and the surrounding concrete slabs, which were replaced one-to-one. All of the pool technology was replaced and the water supply/drainage system was adapted to today's standards. The bathing pavilion was repainted. Its roof, which had already been completely renovated in 2009, was inspected and gravel was added.

Surroundings
Over the past few decades, the original, clearly defined landscaping has overgrown the once open building, in some areas quite severely. The trees and bushes were thinned and cut back via extensive pruning work. The view of the surrounding topogra-

phy and the Alps is unobstructed once more, as is the direct view of some areas of the USM factory site. A footpath across the sloping meadow between them will in future connect the “Buchli” and the factory building.

Closing remarks

Extensive renovations such as those carried out to the “Buchli” are like a journey through time, combining past, present and future. The past urges us to understand and envision what already exists. Certain requirements must be met for the building to fulfil its intended future purpose. The conditions of the present – standards/laws, protective legislation, budget, etc. – affect both remnants of the past and visions of the future.

Ideally, this interplay will ensure the preservation and revival of a cultural asset that, given the appropriate care, can be secured for decades to come. This requires intensive collaboration between developers, architects, authorities, tradespeople and planners; it also requires an open mind and a willingness to take such architectural monuments into the future with great care, attention to detail and a solution-oriented approach. We firmly believe that this was a great success with regard to the Schärer family home and would like to thank everyone involved in the project, especially the developer, who supported us with extensive expertise and covered the cost of the renovation work.

Commissioned by
USM U. Schärer Söhne AG, Münsingen

Architect
vuotovolume Architekten gmbh, Bern

Historical preservation
Office for the preservation of historical monuments of the Canton of Bern (Hans Peter Ruch, Heinz Schuler, Daniel Gygax)

Steelwork
– USM U. Schärer Söhne AG, Münsingen
– Stoller Metallbau AG, Belp

Technical planners
– IEM AG Ingenieure HLKS, Bern
– Elektroplan Buchs & Grossen AG, Frutigen
– Emch+Berger AG, structural engineers, Bern
– Zimmermann+Leuthe, building physicists SIA, Aetigkofen
– BUC Bau- und Umweltchemie AG, Bern

Construction period
2015–2019

Previous renovations
– Lower level/upper level glazing 1987/88 complete replacement, including rubber window frames Roof 1990s additional insulation
– 2010 tar and gravel roof completely renovated
– USM Haller MINI steel construction system 2007 fully painted
– 2010, 2013 partial repair of corroded areas

1 April 2019: Mounted roof panels and prepared building technology installation for the integration into the wall elements (upper floor).

2 May 2019: Painting being done on the spiral staircase – using the original colour USM Green (ground floor).

3 July 2019: Renovation pool.

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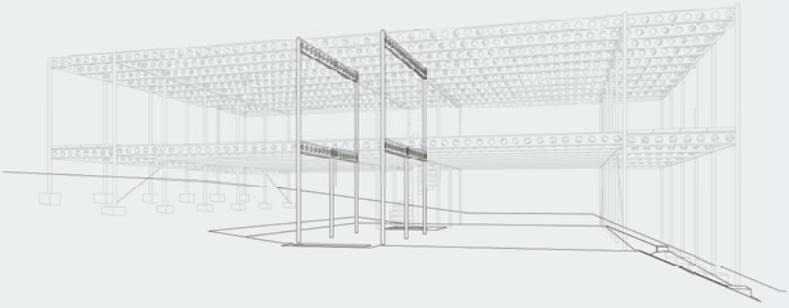
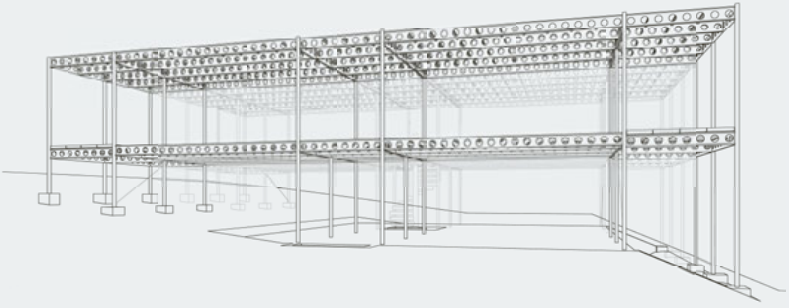




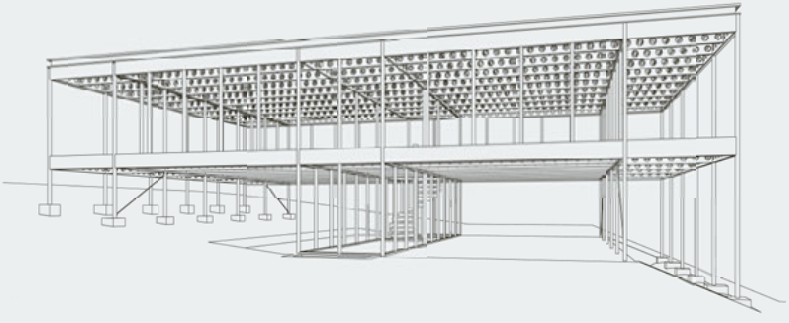
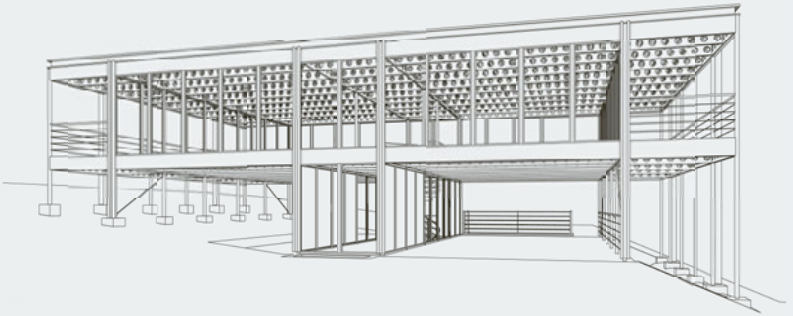
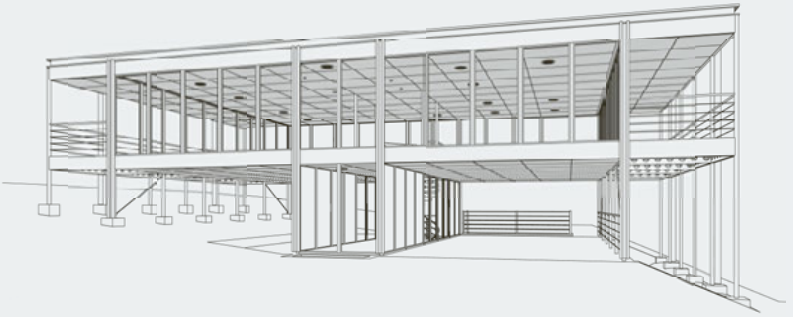
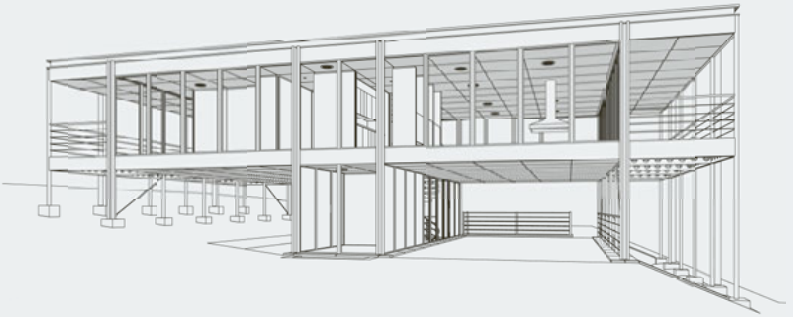


Illustration by vuotovolume Architekten GmbH







Reconstruction as a preservation strategy

Honouring the preservation of historical monuments

Office for the preservation of historical monuments of the Canton of Bern – with thanks to Robert Walker for his research

Initially, the gentle renovation of the façade was the sole focus. However, it quickly became clear that the hidden damage was much more serious than anticipated. The columns in particular were so severely corroded that they could not be saved – meaning that the building had to be demolished and rebuilt. The renovation proved extremely challenging for everyone involved.

To maintain the delicate look of the steel construction, most building components were to be replaced with pieces true to the original. This meant using the same materials, shapes and colours. However, adjustments were inevitable to prevent future damage and to ensure that the building conformed to the relevant standards. Unlike the steel construction, the original interior has largely been preserved. It has simply been freshened up or furnished with parts that match the original design.

In terms of historical preservation, it is certainly fortuitous that the reconstructed "Buchli" is almost identical to the original building. The team has succeeded in preserving its 1960s aesthetic and articulation of space as a testimony to future generations.

The architecture firm *vuotovolume* began work on the renovation of the house at Buchliweg 30 in Münsingen in 2015. The developers were hoping for a "gentle renovation of the façade" and the building technology for the modern skeleton structure from 1969. However, it quickly became clear that the hidden damage to this building of historic importance worthy of protection was much more serious than anticipated. In particular, the interiors of the columns were so severely corroded that they could not be saved. Their replacement meant that the only choice was to demolish and reconstruct the building. To document the renovation process and the original construction from 1969, in cooperation with the Office for the preservation of historical monuments of the Canton of Bern, a room book was created to keep a detailed list of all the work performed.

The process of rebuilding the monument turned out to be an extremely challenging yet thoroughly exciting venture for everyone involved. The replacement of specific building components proved to be particularly complicated. However, thanks to the committed architects and the developers, the company USM, viable solutions were found.

Staying true to the original …

For most building components, the goal was to stay "as true to the original as possible". This meant using the same materials, shapes and colours. However, to avoid corrosion damage in the future, some adjustments were inevitable. The column profiles measured in inches are now only manufactured in the USA, which is where they were therefore ordered from. In terms of the material, the decision was made to use chrome-nickel steel as a better solution in some areas. Small, invisible measures such as sleeves on the railing fastenings prevent future water ingress. The

1 September 2019: Installation of the restored original Therma kitchen (upper floor).

2 September 2019: Reproduced fireplace (upper floor).

3 October 2019: Newly installed carpet (upper floor).

colour was not an issue as the original metallic grey is still produced today.

The brittle, rubber window gaskets could be recreated true to the original versions. As they had already been replaced together with the glass in 1987 and were therefore no longer the originals, they could be replaced without any concern. The new krypton double-glazed insulated glass has a similar low thickness to the original windows, which is an essential feature for the delicate appearance of the USM Haller MINI steel construction system.

… under new conditions

A key issue of the reconstruction process was adapting the structure to comply with current standards on safety and thermal insulation. For example, according to current safety regulations, the railing heights were too low. The decision was therefore taken to increase the height of the railings on the balconies but not on the spiral staircase as the building is no longer used as a place of residence but simply for receiving visitors and to showcase the USM Haller MINI steel construction system developed in cooperation with Fritz Haller. The change in usage made it significantly easier to preserve the original building. It also means that the house, which is only used sporadically, is not subject to the current regulations on thermal insulation.

A question of detail

The architecture of the 1960s and 1970s poses a particular challenge for the preservation of historical monuments. In addition to restoration, reconstruction, reproduction and even reinterpretation are often topics of discussion. However, the historical value of the original substance is being increasingly recognised. In terms of historical preservation, one question here is how much of a building's significance as a monument is lost when a large part of the original structure has been lost.

In the case of the Schärer house in Münsingen, it was possible to reuse the main and box beams with their round holes, which are characteristic of the MINI system. However, many other structural elements had to be replicated. Unfortunately, it was not possible to identically reproduce the symmetrically divided façade mullions with the rubber glazing profiles. The metalworking company suggested an asymmetric solution, primarily to secure the new rubber and stainless steel glazing profiles. You cannot tell the difference when looking at the completed building but it technically violates the rules of the system. In the case of a system-based structure, the question arises as to whether adjustments have to conform to the system or if it suffices to identically recreate the building's appearance.

Unlike the steelwork, the original interior of the former home and office building has been largely preserved. In particular, the glass sliding doors, the metal kitchen, all carpentry elements and the sanitary

installations were removed and carefully restored. The high formaldehyde content meant that the chipboard panels in the floor had to be replaced; for the interior design elements, on the other hand, sealing the panels by painting them sufficed. The floor coverings and individual structural components were replaced as close to the original as possible, for example the rubber napped flooring in the kitchen and bathrooms or the built-in light fixtures. The architects spent a great deal of time and effort in choosing the carpet for the floors on all levels.

Preserving the system as a testimony to future generations

Even before building the Schärer house, Fritz Haller had some experience using the MINI system, which had been produced since 1967, for example with the construction of apartments for guest workers in Mellingen and the Barth and Piguet houses. According to Laurent Stalder and Georg Vrachliotis (in: *Fritz Haller. Architekt und Forscher*, gta Verlag 2015), the many sketches for the Schärer house reveal that Haller was still looking to make improvements to the system. At the time, the MINI system had not yet been completely fine-tuned.

The steel construction systems USM Haller MAXI, MIDI and MINI have the advantage of having been well documented in system catalogues and numerous publications. In particular, the catalogue for the "Industrialisation de la construction" exhibition at the EPFL in 1970 presents full details of how the MINI system is constructed. Thanks to being documented in catalogues, the construction of the Schärer house is comprehensible. From the perspective of historical preservation, the virtually identical and transparent reconstruction of the house at Buchliweg 30 in Münsingen with its almost original interior is certainly considered to be fortuitous. The team has succeeded in preserving its 1960s aesthetic and articulation of space as a testimony to future generations.

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