

VELUX®



ZU-HAUS

Single-Family House in Auersthal, Austria



SITE

The wine village of Auersthal in the Weinviertel region is still characterised by dense and enclosed housing in the village centre, a beautiful alley lined with wine cellars and a gentle, hilly landscape. On the outskirts of the village, squeezed between the neighbouring buildings, a barn typical of that region has survived – though in bad shape, unfortunately. Its owners, Döllinger-Tsao family, decided to have it demolished and replace with a new building, connected to the parents' house.

Being passionate about architecture, they started a in-depth research on a range of possible approaches to the new volume. Various ideas, such as a wooden cube contrasting with its surroundings, were born – and abandoned.

Eventually, the family came across architect Martin Rührschopf, who has already completed various projects in the surrounding area of Vienna, and is known for his sensitive approach and ecological architecture suitable for the location. An ingenious, simple, low-cost building technology concept that is perfectly dovetailed with the building and its architecture helped save money: despite the high quality of design and living conditions, could be realised in a very cost-effective manner.

After a thorough analysis of the structure of the surroundings, various alternatives were simulated in the course of a "simultan-planning© workshop" to develop a solution perfectly tailored to this specific village.

On the site of the old barn, the architect created a home that incorporates the appearance of the original farm building – but with modern characteristics.

"Hence, it became neither a "modern, cool box," nor a modified country house with muntin bars on the windows and polystyrene profiling."

Martin Rührschopf, architect



It is harmoniously integrated into the row of houses and connected to the parents' home.

The zu-haus radiates a pleasant simplicity that has been typical of the Weinviertel region for many centuries and has shaped the cultural landscape.



ENVIRONMENT

Project zu-haus is seamlessly integrated into the close-density housing culture of this typical Weinviertel village. The new volume is quoting the architecture of the demolished barn in a respectful, yet innovative and modern way.

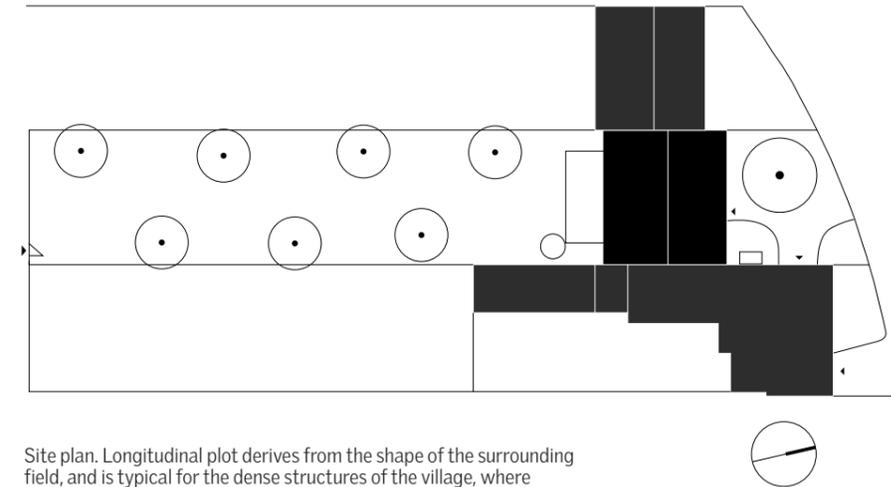
The traditional functional elements of the ventilation slits and the sliding barn doors were retained and reinterpreted. The new sliding "door" also creates the flexibility to close off the street frontage or open it up.

On the inside, too, the analogy of a contemporary interpretation of a barn is continued: pillars, supporting structure, wood beam ceilings and the roof are all made of wood.

Traditional materials were used throughout: wood, brick, iron and stone. Everything is characterised by its durable, calm and pleasant radiance.

" "Truthfulness" in architecture means to me relying on natural materials and handcraft."

Martin Rührschopf, architect



Site plan. Longitudinal plot derives from the shape of the surrounding field, and is typical for the dense structures of the village, where each house is supposed to occupy a possibly narrow plot towards the street. The garage is located in the parents' house on the east, the entrance leading through a shared front yard.



SIMPLE – TIMELESS – VIBRANT

Guided by the principle of "simple, timeless and vibrant", a permanent home was created, with its qualities gained through omission.

As the building deliberately opens up towards the garden, the interior and exterior space could be successfully interlaced. The neighbouring building acts as protection against wind, prying eyes and noise.

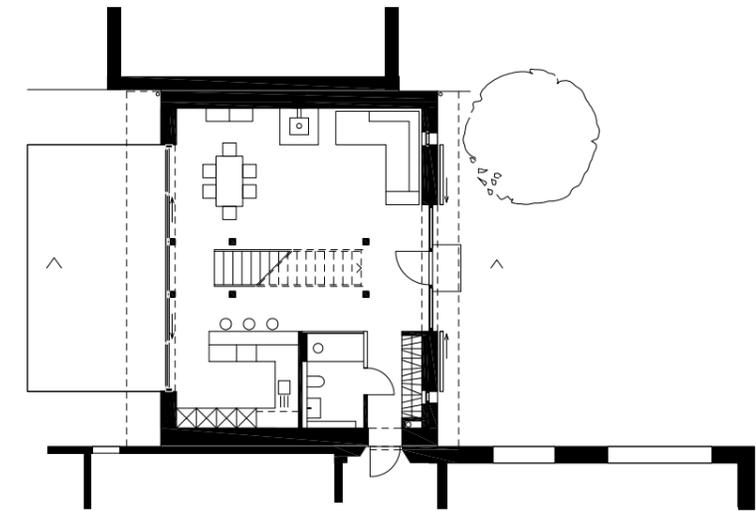
The ground floor comprises a wardrobe, a toilet, a spacious living, kitchen and dining area – all sharing the same waxed concrete surface.

Internal arrangement of the house foregoes stairwells and unused space. The sculptural stairs are directly integrated into the living area as a design element – a single-flight staircase – and lead to the gallery floor. There, you will find the gallery, the bedroom and the bathroom.

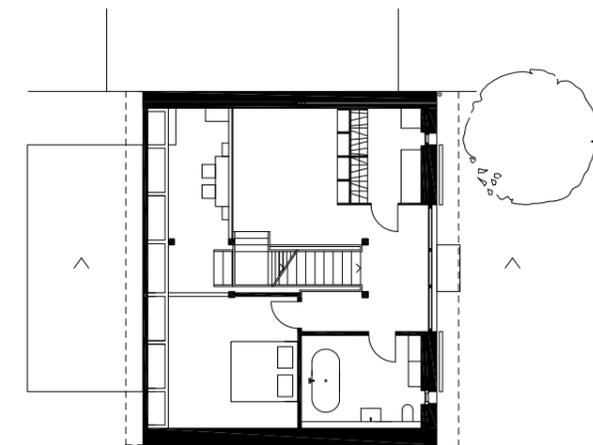
Top floor presents itself as an open space and serves as the daughter's hideaway, where she can play, sleep and relax. Ascending plateaus structure the living area and create communication axes – housemates can be seen from one level to another, and the room becomes a place.

Generously sized sliding doors on the ground floor create a visual relation and a link to the garden. As the roof balcony is integrated into the roof, standing on it is like standing on the roof – you can gaze into the vastness of the Weinviertel region's hilly landscape and even spot the Schneeberg in the distance on a clear day.

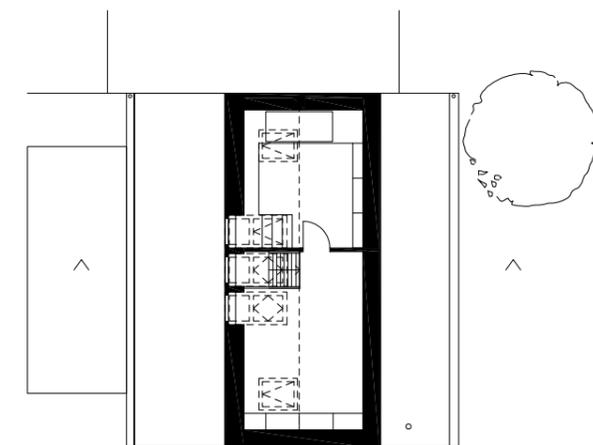




Ground floor. A symmetrical entrance is hidden behind a transparent staircase. On the eastern side of the plot the garage door and a window. Two houses are read as independent volumes, but the interiors are connected.



Gallery floor. A cut-out in the ceiling connects a multi-use space with the living room.



Attic. The daughter of the family occupies the top floor. An airy, sunny space invites to play and rest.

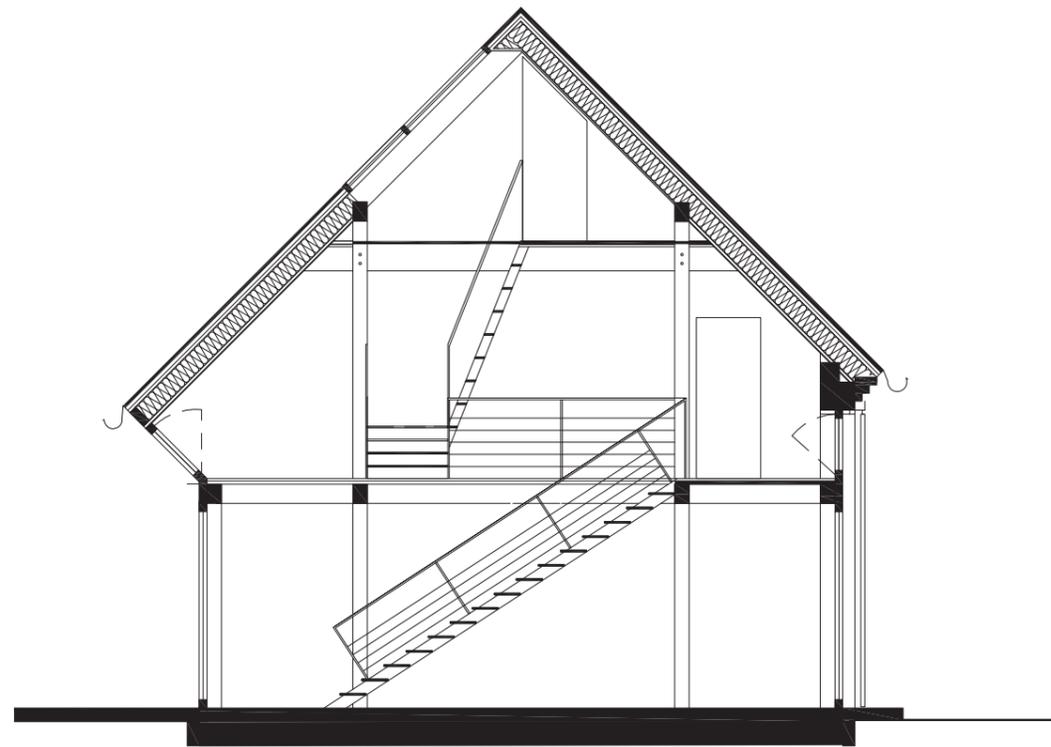
DAYLIGHT

A clear goal was to provide the living areas with a sufficient amount of daylight even on dull days, which are quite common in the Weinviertel region during autumn and winter when there is often fog. However, lighting is not merely guaranteed by large-scale vertical glazing on the southern side but also by well-placed, adequate roof windows.

Thanks to this deliberate use of zenith light (light from above), light can even reach the rear areas of the ground floor through the gallery floor and thus create balanced lighting. This even lighting is one of the most critical factors for the whole interior radiating generous space and creating an open and friendly impression.

"Daylight visualizer helps the clients to imagine the impact of daylight in rooms. It helps the architect to determine the perfect location of the roof windows."

Martin Rührschopf, architect



Section. A variety of openings, from glazed balcony doors to VELUX roof windows, ensure optimal daylight conditions and fresh air in the house. A double-height living area and a transparent stair play an important role as well in air circulation as in psychological perceiving of design's lightness.





VENTILATION

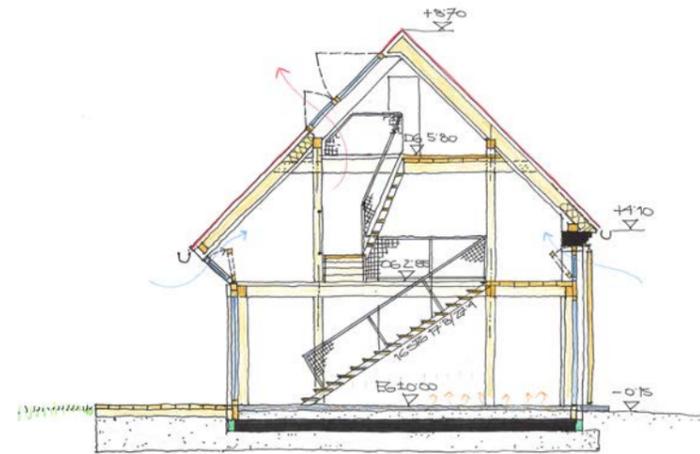
It was the building owners' express wish not to install a mechanical ventilation system. So the architect was able to include, at the early design stages, the ideal positioning of the necessary supply and exhaust air openings in the form of facade and roof windows. As a result, the ventilation drive (chimney effect) gives maximum benefit with no energy consumption.

Innovative ventilation concept with automated windows

Both the building owners and the architect were open to using an innovative ventilation concept with automated windows.

Stack effect

Facade windows with concealed motors, which are completely invisible from the inside and outside, act as supply air openings. VELUX Integra® roof windows also have concealed motors and let air effectively escape upwards. Architect Rührschopf calls these ventilation openings "climate hatches." This automatic, natural ventilation system keeps technology to a minimum.



Adequate window ventilation

During the heating period and transitional seasons, CO₂ sensors installed in various areas send a signal to the electric windows to let them know when to open automatically.

As a result, the various areas can easily be ventilated during the heating period, as recommended by hygiene researcher Peter Tappler of IBO Innenraumanalytik: not too much (that would be a waste of precious heating energy and would also lead to extremely dry indoor air) and not too little (for hygiene and health reasons).

Natural Ventilative Cooling

In midsummer, the CO₂ sensors are simply switched off, and the system changes to Natural Ventilative Cooling. This system uses a simple principle of physics – night time cooling through targeted ventilation. Regardless of whether the residents are at home or not, an integrated time switch opens the windows automatically at 10 p.m., and they remain open until 7:30 a.m., when they close again automatically. At night time, Natural Ventilative Cooling helps cool down the building components that have heated up during the day. This method of window ventilation operates with no energy input – it is a passive cooling system, and makes an essential contribution to a pleasant indoor climate during summer.

First experiences with automatic window ventilation

The indoor air quality showed a constant CO₂ concentration far below 1,000 ppm, achieving "special to high indoor air quality" according to ÖNORM EN 13779. In summer mode, Natural Ventilative Cooling has also proved its worth, with balanced and pleasant temperatures.





PROJECT DATA

Project:	Single family house
Location:	Auersthal, Austria
Construction period:	2012-2013
Floor space:	129 m ²
Planning and site supervision:	martin rührnschopf architecture, 1130 Vienna
Static:	Zwang Ges mbH, Bockfließ
Building physics:	Eder Bau GmbH, Zistersdorf
Building technology concept:	martin rührnschopf architecture, 1130 Vienna
Daylight planning:	VELUX Österreich GmbH, Wolkersdorf
Ventilation planning:	VELUX Österreich GmbH, Wolkersdorf
Building concept:	Active House Standard
Master builder's work:	Eder Bau GmbH, Zistersdorf
Timber construction and roofing:	Zwang GesmbH, Bockfließ
Photos:	Jörg Seiler (architectural photography) Martin Rührnschopf and Hans Döllinger (site photos)



VELUX Österreich GmbH
Veluxstraße 1
2120 Wolkersdorf
+43 2245 3235

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