

# ERDEN Tour

Building with 100% earth

**LEHM  
TON  
ERDE**







---

## The material

Without question, building with earth can be complex. But it can also be quite simple. Because with every project we've had the privilege of implementing over the past decades, our understanding of the material and its properties has grown. What we've learned, we want to pass on. To you. And to everyone who is ready to indulge in what is perhaps the most beautiful form of building.

These rough figures are based on our experience and testing throughout many realised projects. They're good rule-of-thumb values. The real numbers will vary, though, depending on the excavated material. So when implementing a project, material testing needs to take place each time.

---

Thermal conductivity

**$\lambda=0,9 \text{ W/mK}$**

---

Average compressive strength

**$2.4 \text{ N/mm}^2$**

---

Minimum exterior wall thickness

**350 mm**

---

Minimum interior wall thickness

**70 mm**

---

Drying time

**4–6 Weeks**

---

CO<sub>2</sub> emissions from production\*

**$46 \text{ Kg/m}^3$**

---

Fire classification

**RE(I)90** for 25 cm wall thickness

---

Rated sound reduction index

**53 dB** for 20 cm wall thickness

---

Mass

**$2250 \text{ Kg/m}^3$**

---

Production energy\*

**$930 \text{ MJ/m}^3$**

\*Source: KBOB: Ökobilanzdaten im Baubereich 2009/1:2016. URL: [https://www.kbob.admin.ch/kbob/de/home/themen-leistungen/nachhaltiges-bauen/oekobilanzdaten\\_baubereich.html](https://www.kbob.admin.ch/kbob/de/home/themen-leistungen/nachhaltiges-bauen/oekobilanzdaten_baubereich.html), accessed 02.02.2021.



## Workshop Rauch

Our Atelier was built as an exploration and a demonstration of all kinds of earthen building techniques. Ceramics, adobe, compressed earth blocks, and rammed earth are displayed in harmony with other natural materials such as timber structure and reed insulation. The planning was carried out together with the architect Robert Felber and the construction was done by Martin Rauch and his team. Perhaps the workshop's most striking feature, Martin used terracotta tiles embedded in the exterior rammed earth walls to act as erosion breaks by creating water runoff drips – a traditional strategy adapted from Saudi Arabian vernacular buildings. The technique has stood the test of time as the walls still stand in splendour from 1994.



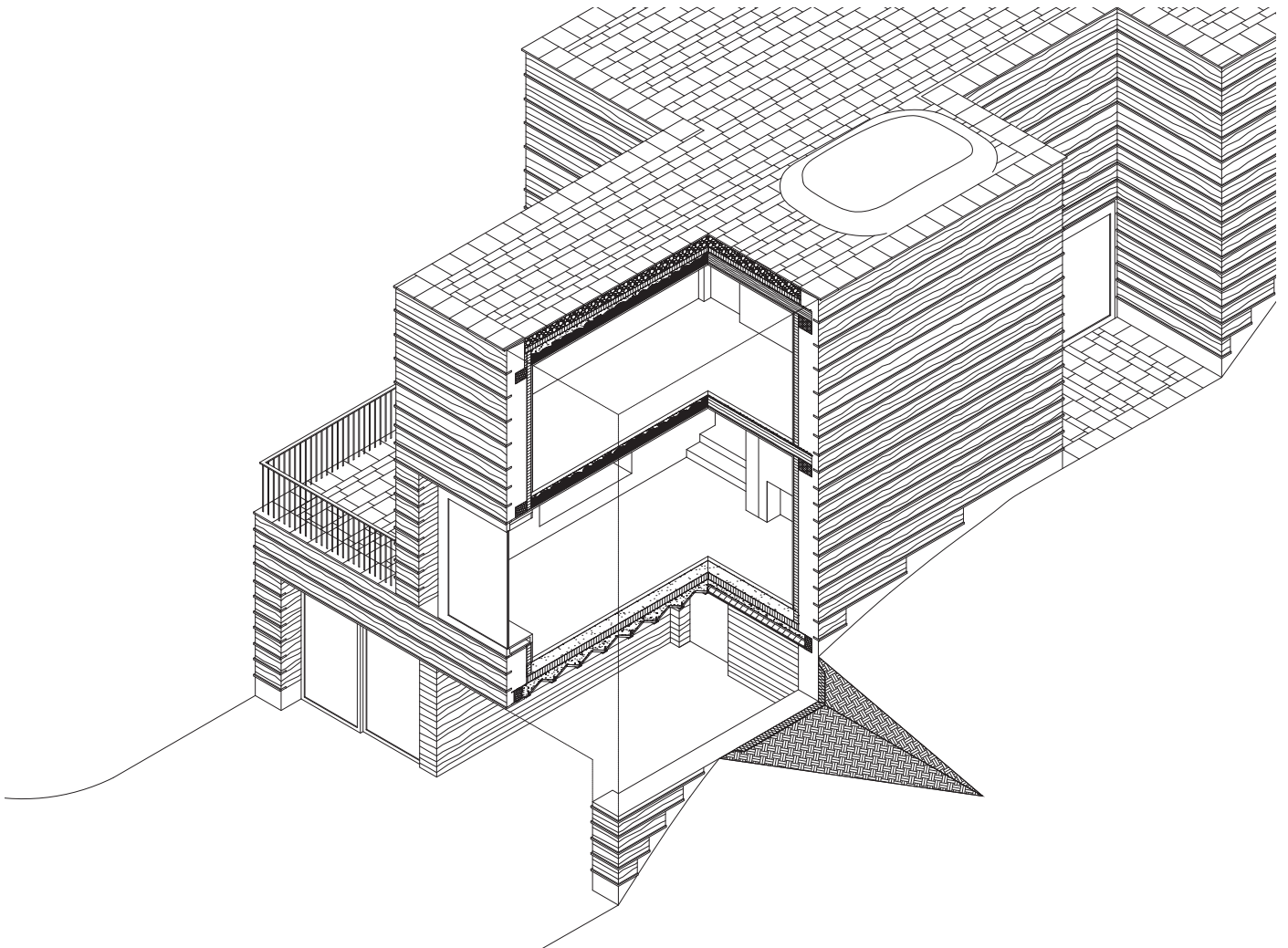


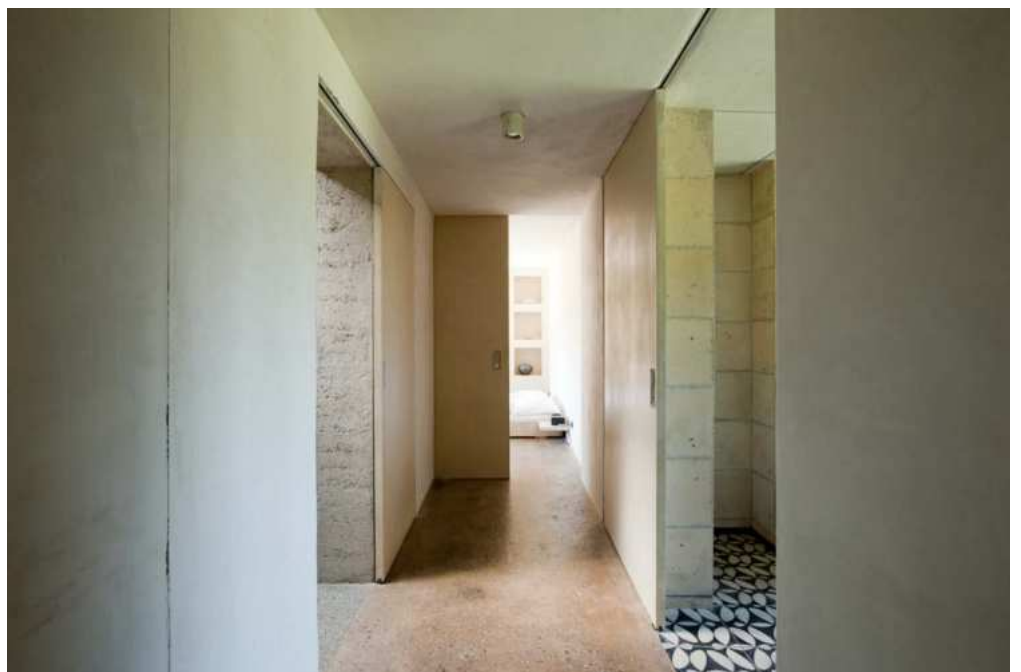




## House Rauch

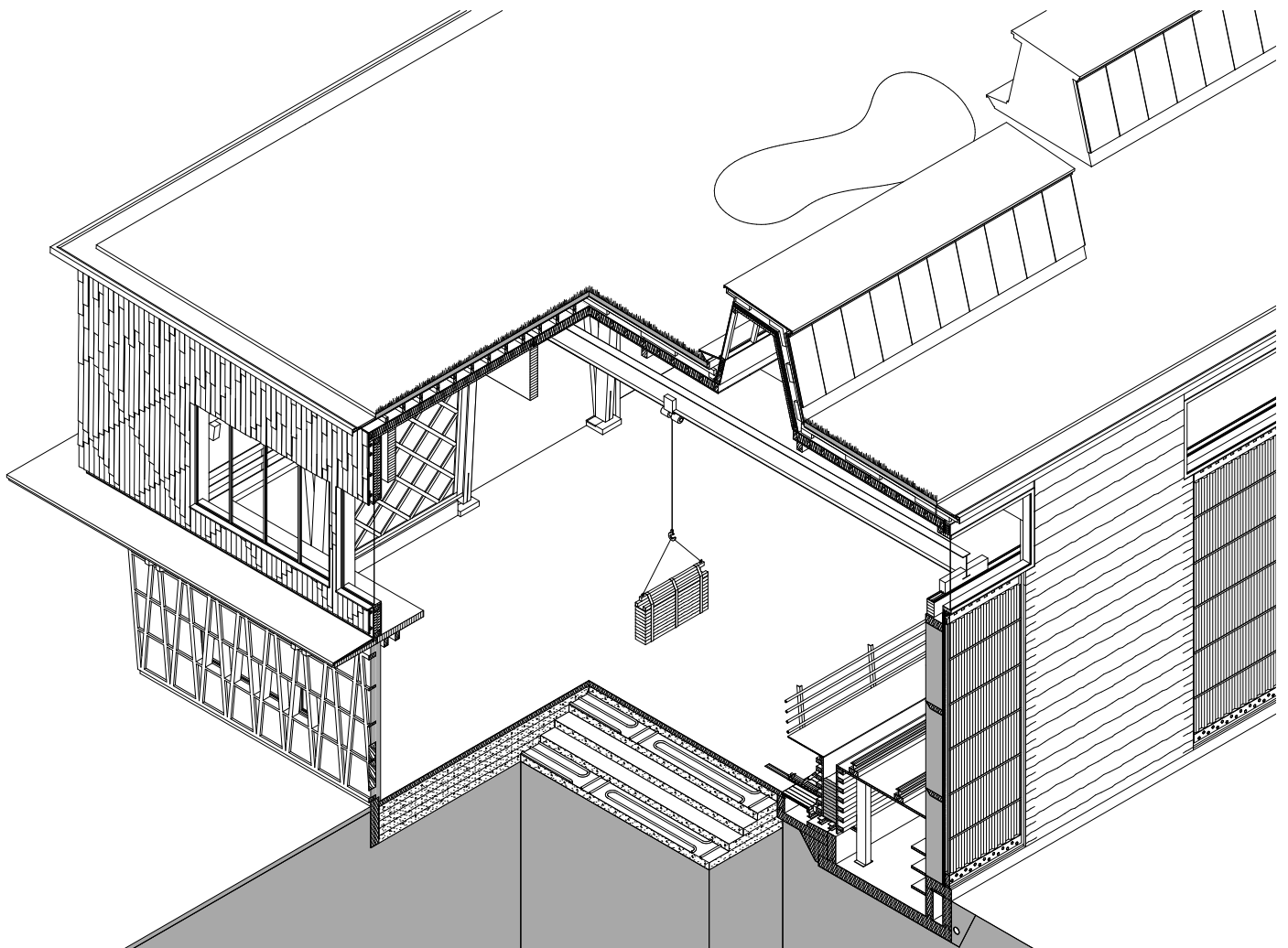
With views out to the Walgau valley, Haus Rauch sits on a hillside taking in all the glory of the Austrian Alps. The house is also made of these Alps. Eroded Alps. When the African and Eurasian tectonic plates collided, the extreme event caused marine sedimentary rock to thrust up and fold into high mountain peaks such as Mont Blanc, the Matterhorn, and of course the peaks around Schilins. Over time, material crumbled and washed down into the valleys, depositing the perfect material for earthen construction. You could say this house has been 300 million years in the making.



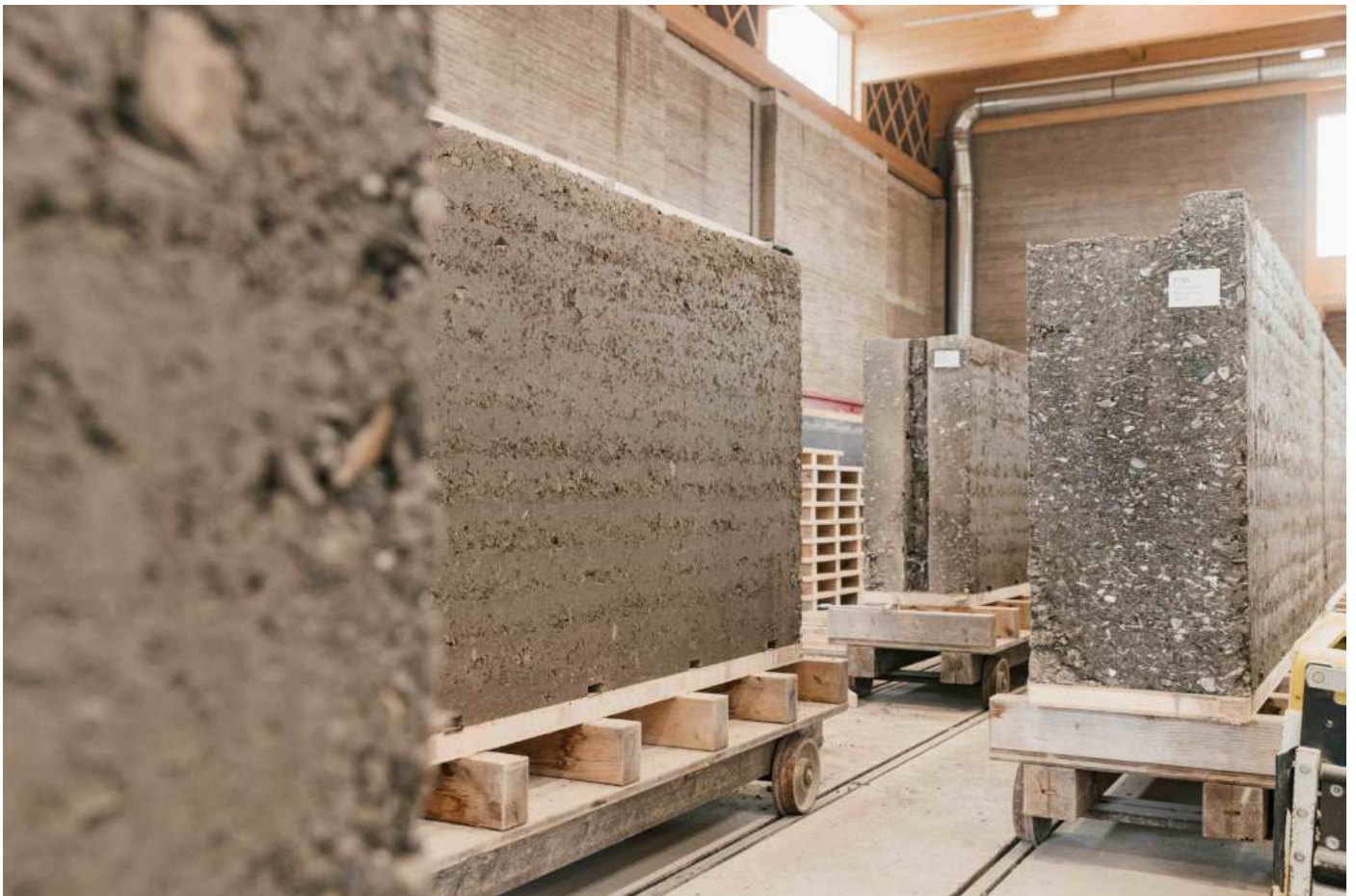


## Lehm Ton Erde workshop hall

The *Werkhalle*, or workshop hall, is one part innovative factory design and one part clay lab for the development of earthen materials and products. It's heart is affectionately called 'Roberta', a specialised ramming machine that pumps earth through its formwork veins and produces 40 m long rammed earth walls at a time. These walls are cut into elements, giant prefabricated blocks that stack like bricks on-site once dried. The *Werkhalle* also houses our Lehm oven production and our material testing operation. Always a hive of activity, the *Werkhalle*, like the *Atelier* before it, is a prototype in some ways. One that pushes the boundaries of earthen construction and offers an enigmatic counter proposal to all other industrial architecture.







## House ERDEN

The ERDEN House sets new standards for innovative, sustainable building. It is made from prefabricated rammed earth elements using 100% of the site's own excavated earth, combined with wood, reed, lime, sheep's wool, wood wool, casein, and other high-quality natural materials. The load-bearing earth walls store heat and coolness, while reed insulation and lime plaster unite traditional building materials with contemporary design. An integrated solar system, a green roof, and the garden promote biodiversity. Created with the expertise of many craftspeople and innovative companies, the ERDEN House combines living and working – demonstrating how future-oriented building can meet the highest standards of architecture, aesthetics, and circular economy.









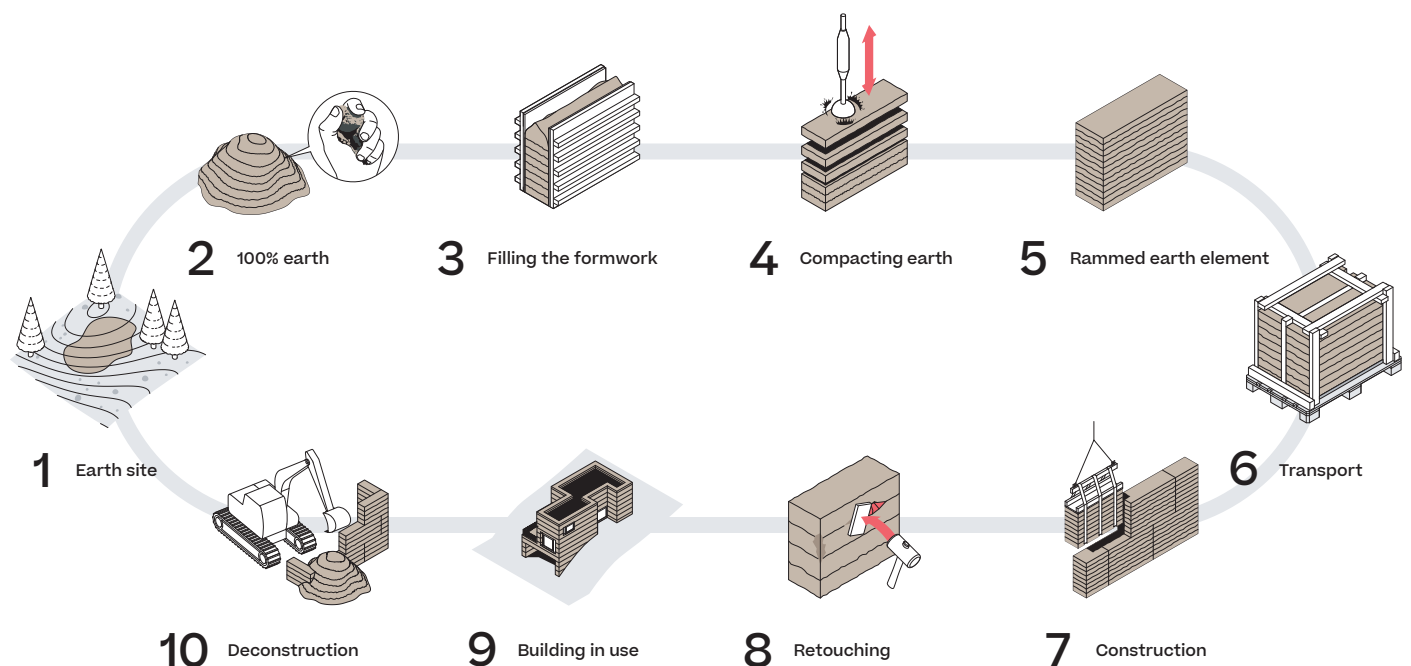




## Sustainability

How many materials do you think it takes to make a modern house? Maybe you can name the big ones, but how many are there tucked between, wrapped behind, or laid beneath walls, roofs, and floors that we don't see? Modern houses have over 200 different building materials. Not to mention the waste that comes with packaging them. If that doesn't sound like much, compare it to a pre-industrial house from this region - it typically had less than 20 materials. Of course, some of this building technology makes our homes more comfortable, more convenient. But how many of those materials are essential to building a house and how many are a luxury? And what impact does such an assembly of resources have on the environment? How many of these materials can be recycled or reused with minimal effort and energy? These are the questions that drive us, that make up our ethos. Rammed earth is dug from the ground and can be returned to the ground with no additional processing. Build it, break it, and build it again. What would homes look like if we prioritised materials with these questions in mind?

## The cycle



---

2008





---

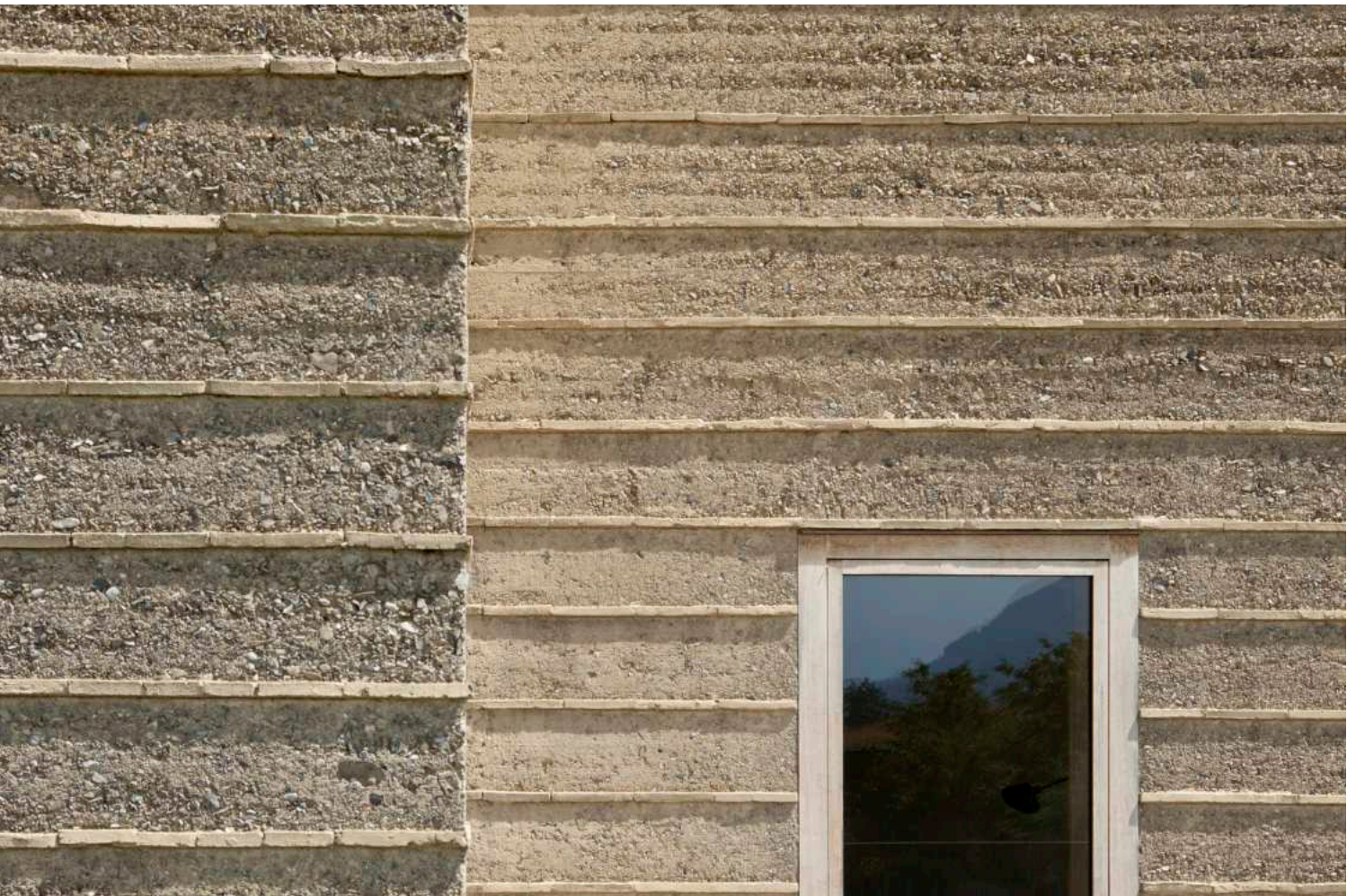
## Erosion

We're often asked about erosion of earth walls and how to stop it. Everyone wants their building to last forever...even if their taste doesn't. Rammed earth is essentially water-soluble, but with proper design, you can ensure the earthen walls have time to dry out and keep on keeping on. Rammed earth structures will last centuries if made right. Erosion checks are one way of doing this. We introduce a harder material, usually either trass lime or terracotta tiles, into the layers to slow down the flow of water across the surface. Like little water speed bumps. Fine clay will wash out from the surface but larger stones will stay embedded, protecting water from soaking deeper. This process happens over the first few years in the life of the wall. A noticeable change in texture will occur as the wall ages. Like the first silver hairs on one's head or the patina on a bronze bust, erosion accentuates the natural character and beauty of the rammed earth. In the elegant words of Japanese novelist Jun'ichirō Tanizaki,

“For better or for worse we do love things that bear the marks of grime, soot, and weather, and we love the colours and the sheen that call to mind the past that made them.”

---



2012



# LEHM TON ERDE

**Lehm Ton Erde Baukunst GmbH**  
Quadernstrasse 7  
6824 Schlins  
Austria

[www.erden.at](http://www.erden.at)  
[info@erden.at](mailto:info@erden.at)

 [erden.at](https://www.instagram.com/erden.at)  
 [ERDEN](https://www.linkedin.com/company/erden)

