

## Terramobil – a mobile workshop

Alongside research and professional networking, promoting earth building is about communicating and raising awareness, not just within the industry but also among the public in general, so that they appreciate and expect environmentally friendly, healthy buildings. Since 2021, IG Lehm has been developing a mobile workshop under the name Terramobil that travels from location to location and raises awareness of Switzerland's widespread clay deposits. It enables people to experience clay first-hand through practical and personal experience so that they can develop a basic understanding of the building material. The uncomplicated versatility of clay has already been experienced at various vocational colleges, universities and specialised venues throughout Switzerland, and in future we aim to make this possible anywhere. The terramobil is conceived as a form of active acupuncture in social structures, connecting people through learning about and working with clay and earth.

### Earth building in the Swiss context

In Switzerland, the construction and running of buildings accounts for 23% of greenhouse gas emissions [1] and for around 50% of total primary energy consumption [2]. The construction industry produces 65% of all waste [3]. The ongoing high level of building activity coupled with space restrictions mean that countless tonnes of excavated material containing clay are taken from construction sites to landfill sites every day. Switzerland has an abundance of clay deposits suitable for use as a building material, but few people are aware of them. At the same time, the disposal of excavated material – containing large quantities of suitable clay – has reached such a degree in the cantons of Geneva and Zurich [4] [5] that excess material is being transported to neighbouring regions.

Switzerland has a comparatively small earth building heritage that one can draw on to make the building

material more visible in the public eye. Despite a few lighthouse projects and increasing interest in earth building skills in the construction industry, the general public still has little idea of the potential of earth and hardly had any haptic experience of earth as a building material.

As part of its work as the Swiss earth building association, the IG Lehm aims to address this shortcoming. The IG Lehm has been organised as an association since 1996 to jointly and independently promote and develop building and design with earth as a building material. It brings together earth building experts from the fields of consulting, planning, construction and building material production, as well as other interested parties. It aims to address both laypeople and experts in the field of earth building in a practice-oriented manner and to bring them into contact with earth. Every year, it organises various visits, lectures, trips and workshops and, through its members, forms a wide-ranging network. The practical workshops on construction sites are individual, typically two-day training courses, open to earth builders, planners and people interested in earth. IG Lehm also organises practice projects at Swiss universities, runs the vocational clay specialist (Fachkraft Lehm) training programme since 2023 and organises courses at building material dealers.

### Terramobil – the educational concept

In 2021, the Terramobil project was founded within IG Lehm with the vision of bringing earth building to the general public. The concept draws inspiration from various educational formats, experience at trade fairs, and the idea of a small-format mobile “Lehmbox”. The idea was developed by a small team and then published with a view to find funding through crowdfunding. This support did not materialise, but the initiators were not discouraged from pursuing the idea further. The ba-

sic idea behind the educational project is to provide an intuitive and practical way of imparting knowledge about earth as a building material. In addition, earth as an excavation material should be made accessible not only to experts, but to everyone in Switzerland. At present, the Terramobil team includes experts with experience of earth in various professional fields such as architecture, materials science, construction management, teaching, crafts and design. The Terramobil also enables members of IG Lehm to work together on a joint project. The aim is to build up a network of earth partners with the common goal of achieving society-wide acceptance of earth as a high-quality, climate-neutral and haptic building material. The vision for the future is to develop the Terramobil into a mobile workshop, which can be staged in public spaces. As a mobile box, it can generate greater visibility in village squares, at schools, in parks, on construction sites or at events on sustainability, health, building and living, and especially in regions where there are local clay deposits.

The Terramobil format has a modular concept with individual communicative modules that build on each other and can be adapted to the respective target groups. Theoretical and practical content alternate in each module, and can be undertaken at as different locations to enable new perspectives.

Balls made of earth serve as the central theme of a project day, and as a means of demonstrating the princi-

ple of circularity. At the beginning, participants mould a ball that accompanies them throughout the day. Over the course of the day, it is dried, broken apart, made malleable again and moulded into a new shape. (Figure 1).

The first module explains the origin and composition of earth as a building material, illustrates the clay deposits in Switzerland and provides a theoretical background to global earth building traditions up to modern-day earth building in Switzerland and Europe. Participants make first contact with earth as a building material in a building pit. Afterwards, the excavated earth is experienced with all the senses.

In the second module, the properties of clay as a material are explained, in technical as well as holistic terms, from the macro to the micro level, along with the basic principles of earth building. The technical and physical properties of building earth – such as dense grain packing, the mix of grain sizes and the binding force of the clay mineral layers – are shown through a series of stations that demonstrate the principles through practical means, adding variety to the experience. Participants try out the cigar test with different types of earth and learn how to categorise them according to terms such as rich and lean earth.

Earth building applications are the subject of the third module. The hands-on part consists of three practical demonstrations that participants can try their hand at: ramming earth into a small form using hand rammers,



01 Many hands getting to know earth. A project day at Aarau Vocational School, 2022

producing earth blocks using a mechanical press, and applying clay plaster as a base layer onto a reed backing, and as a finishing plaster onto sample panels. The participants discuss the current practice of earth building and the different forms it can take, and discuss their initial experiences of working with earth.

In the fourth and final module, we make connections between the different earth mixes and earth building techniques using the Carasas test. We discuss current developments and the potential of earth building before concluding the day with a tour of an earth building. (Figure 2).

### First implementations

Since Terramobil launched in 2021, 13 project days and 2 exhibitions have already been organised at a total of 5 different locations. Most of these took place in collaboration with local vocational training institutions.

Through contacts with the vocational school in Aarau, the Terramobil team was able to implement the concept for the first time in 2022 in the form of earth building project days. These one-day workshops were initially held on two successive days at Aarau Vocational School (BSA) and have since been expanded to five project days for the 104 first-year trainees in architectural drawing. The architectural/engineering drawing apprenticeship lasts 3–4 years and takes place as a so-called “dual studies training programme” at the vocational school and partner companies. Earth build-

ing is not part of the official training curricula, but the concept of project days provides scope for other input, including practical knowledge transfer from experts outside the core faculty. These are financially supported by education-related funding bodies.

Two different workshops were organised at the Lucerne University of Applied Sciences and Arts (HSLU), adapted to the target group, one for architects and one for designers. The assignments in the HSLU materials workshop were shortened to half a day with a focus on practical experience. For the designers, it was the start of a semester project on earth, so the focus was on analysing the earth samples they had collected and brought with them. (Figure 3).

In cooperation with the Höhere Fachschule Südostschweiz ibW at the Lehmbau Symposium in Chur and the FH Nordwestschweiz at the Swissbau construction fair in Basel, versions of the modules on earth building techniques were devised for a broader interested public who were attending the respective events. This implementation of Terramobil was in particular made possible by the active participation of many craftspeople from IG Lehm and was complemented by an exhibition and lectures (Figure 4).

### A team effort

The Terramobil team consists of a core team that examines the content and structure in detail and manages enquiries and administrative tasks.

02 Clay plaster: first-hand experience of the material and building methods. A project day at Aarau Vocational School, 2023





03 Rammed earth:  
compacting earth in layers.  
HSLU 2023 materials  
workshop

Since the first editions of Terramobil in 2022, the team has gradually expanded due to the open structure, empowering more activists to join the Terramobil team. All the members engage more intensively with earth building and learn from each other. In the last 3 years, the overall team has grown from 4 to 14 people. Alongside the core team, different roles, for example as freelancers or assistants, have expanded flexibility and can help accommodate fluctuating demand on the project days. The remuneration is minimal and bears no relation to the usual salary level of the team members. As such, while striving for professionalism, it has a predominantly voluntary character, and is driven mostly by personal motivation, support from people in the educational institutions and support funding. Due to the size of the team, the input of individuals to Terramobil remains manageable at between 1-3 days per person. To make it easier for new members and freelancers to get involved, a basic level of minimum knowledge has been set out, above which it is possible to freely involve people.

The plan also encompasses a modular list of tools and materials, and an operational plan, so that a compact programme can be run smoothly by different team constellations. The aim is that individual day teams of 3-4 people each can concentrate on the content of the programme. In preparation, all practical exercises and procedures are coordinated in advance on an internal practice day, where open questions can be clarified, and teams are put together.

Experience has shown that it is not so much the transfer of knowledge that presents difficulties when deploying new people at different locations but rather the logistical processes during the preparation and realisation of a Terramobil deployment. The recurring preparation of the reused earth is also time-consuming. Logistical challenges have arisen due to limited financial resources, but these have since been improved. At present, we can use a warehouse in the Zurich area free of charge, and almost all the tools required have been brought together in one place, palletised and inventoried, including the earth block press from the 1980s, which found its way to Terramobil.

#### **Feedback and development**

The project days held at the BSA are now a fixture and have met with a positive response, particularly the practice-orientated modules in which participants have direct contact to materials and interact with them in hands-on exercises. We continue to strive to involve more of the teaching staff at the respective institutions in the project days so that in the long term the theoretical background finds its way through them back into teaching at the vocational training schools.

In the coming years, the project team would like to continue to develop internally while maintaining flexibility so that individuals can be versatile course instructors. At present, the team comprises mainly people with an academic background, and a key aim for the future is to find out how more craftspeople can be brought into the team.

04 Making one's own  
earth blocks with a  
manual press.  
Swissbau 2024



The greatest challenge, however, is the limited capacity of the team members. Each have their more or less earth-related jobs, and the time that individuals have for assignments and the ongoing development of the Terramobil is correspondingly limited. Efforts are therefore currently underway to improve the overall conditions through external financial support and an appropriate degree of professionalisation that builds on the collective, existing network structures. The Terramobil events require a lot of energy from the team members, and there is often little time left for other tasks and for putting into place important structural, co-operative decisions.

A central aspect of the conceptual idea, and for the participants' basic understanding, was the inclusion of excavated earth from the vicinity, but it has not always been possible to combine an event with a construction site visit. In addition, local earths were not always suitable for the respective hands-on exercises. The decision to use the same earth for the hands-on parts has simplified the logistics for the time being, but we must be careful not to forget the relevance of using locally sourced earth as a building material on site. Further competences and opportunities for incorporating local earths must be sought when the actual Terramobil workshop is put into action.

#### **Terramobil as workshop mobile**

The Terramobil currently operates as an educational format and has proven to have a flexible enough structure to function in various settings, working with ed-

ucational institutions in various formats such as project days, workshops and trade fairs to establish initial contact with earth and raise awareness of and interest in the building material. The educational work of the Terramobil team is regarded as an integral part of IG Lehm and the organisational structure of the Terramobil team has shown that various knowledge transfer activities are possible for different target groups. The aim is to open up further application areas with a focus on excavated earth and to spread knowledge about earth to the wider population. At the same time, the current form of storage, relocation and transport of materials and tools is laborious and a new mobile module is required. The Terramobil team is therefore currently working on developing Terramobil into a mobile workshop, which will be launched with a tour throughout Switzerland. (Figure 5).

In the meantime, we are looking at initiating courses with other trade and vocational training schools, and in implementing workshops at architecture offices and ultimately for everyone – until the need to build healthily and sustainably with earth has become a matter of course. The Terramobil has proved itself as an educational format and provides a flexible structure for initiating contact with earth as a building material in various settings. As local forms of social acupuncture, they have been met with enthusiasm and curiosity. It offers a good way to generate awareness, promote visibility and understanding for the material – it is part of the steady stream of drops that sustains and activates earth building.



05 The Terramobil module  
in a public square.  
Terramobil concept 2021

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#### Illustration credits

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