

# 3D Printing Earth Architecture

Project Presentation | Summer Semester 2024

Kathrin Dörfler | Ema Krakovska | Professorship of Digital Fabrication | Technical University of Munich





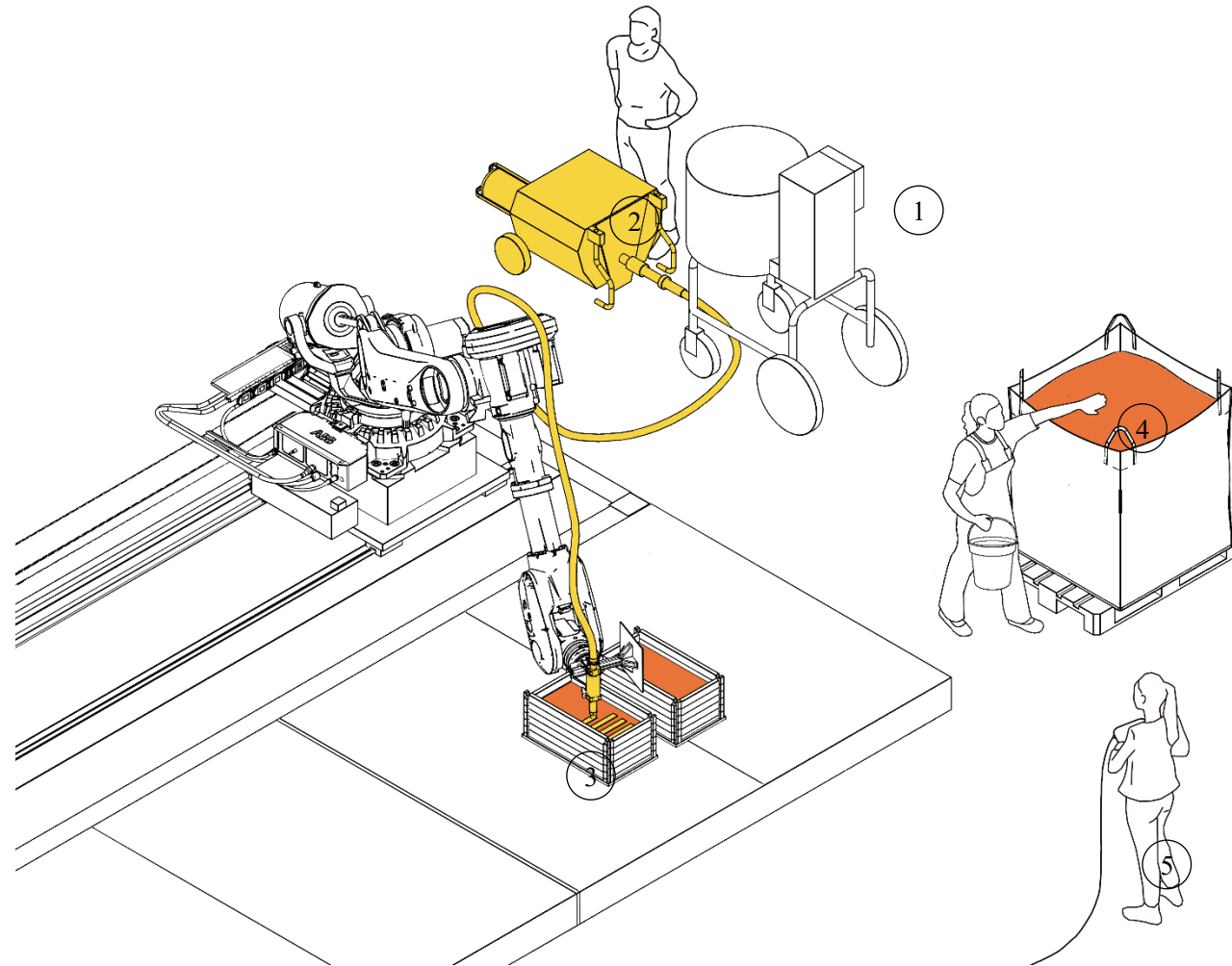
## Material Reform: Building for a Post-Carbon Future

Material Cultures, Amica Dall, Charlotte Malterre-Barthes, Jess Gough



# Motivation





# Method



1. Earth printing



2. Aggregate deposition



3. Compacting

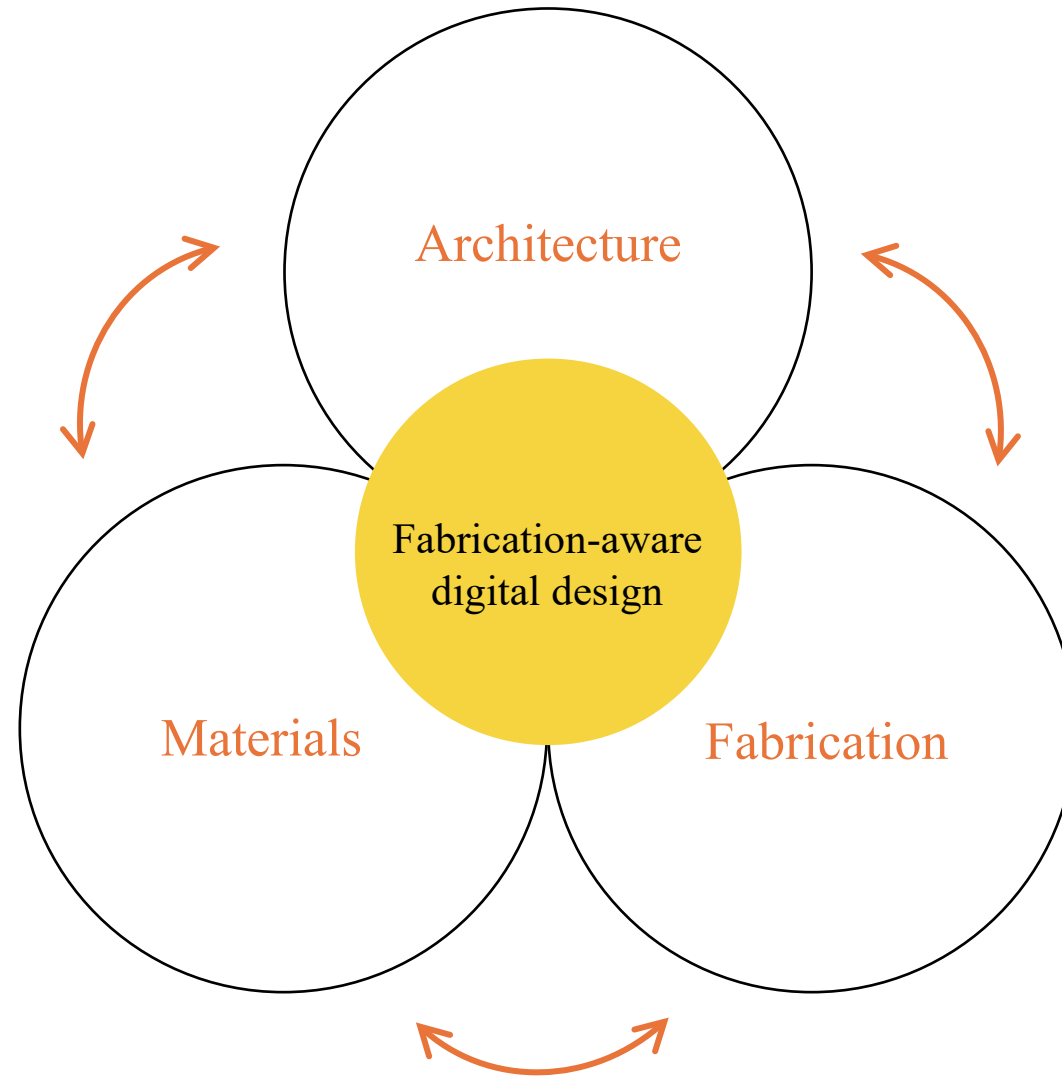


4. Finished layer

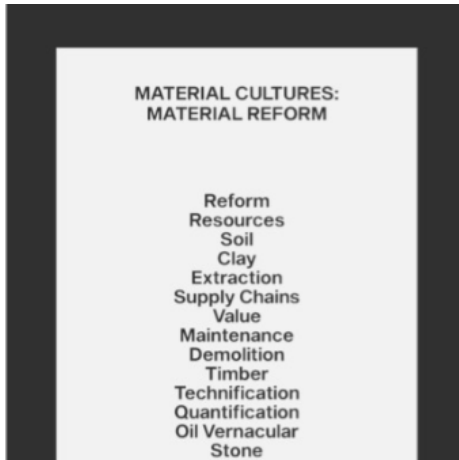


5. Unpacked element

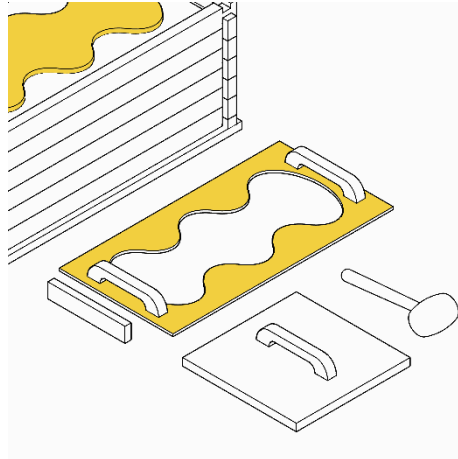
## Holistic approach to design



# Project structure



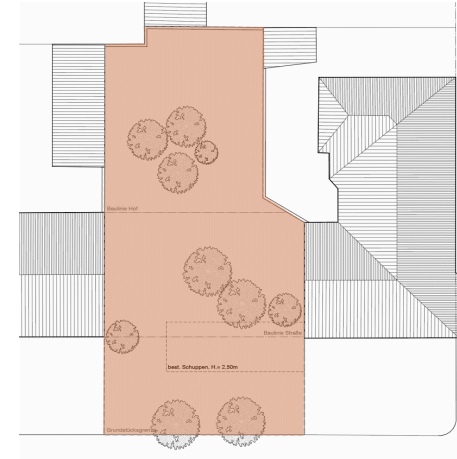
1. Research



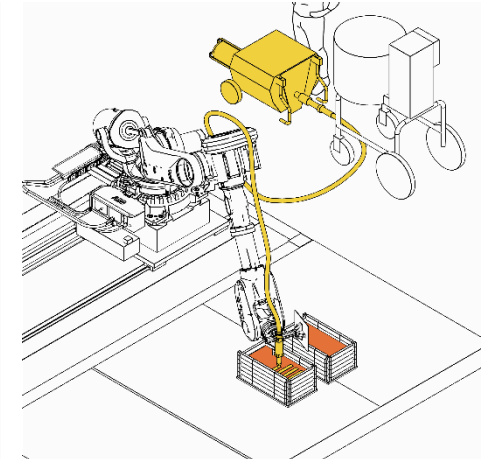
2. Manual material  
and fabrication studies



3. Component design



4. Building design

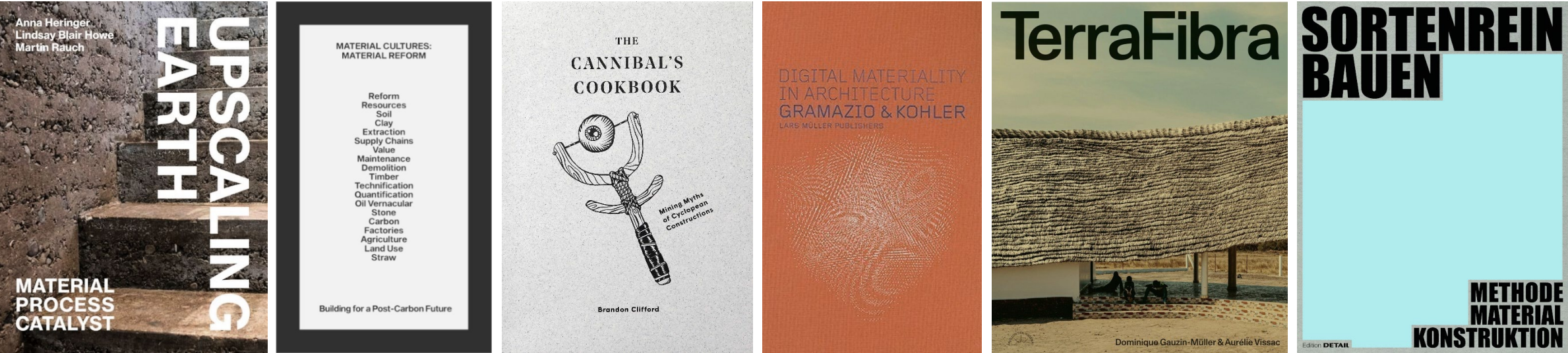


5. Robotic fabrication



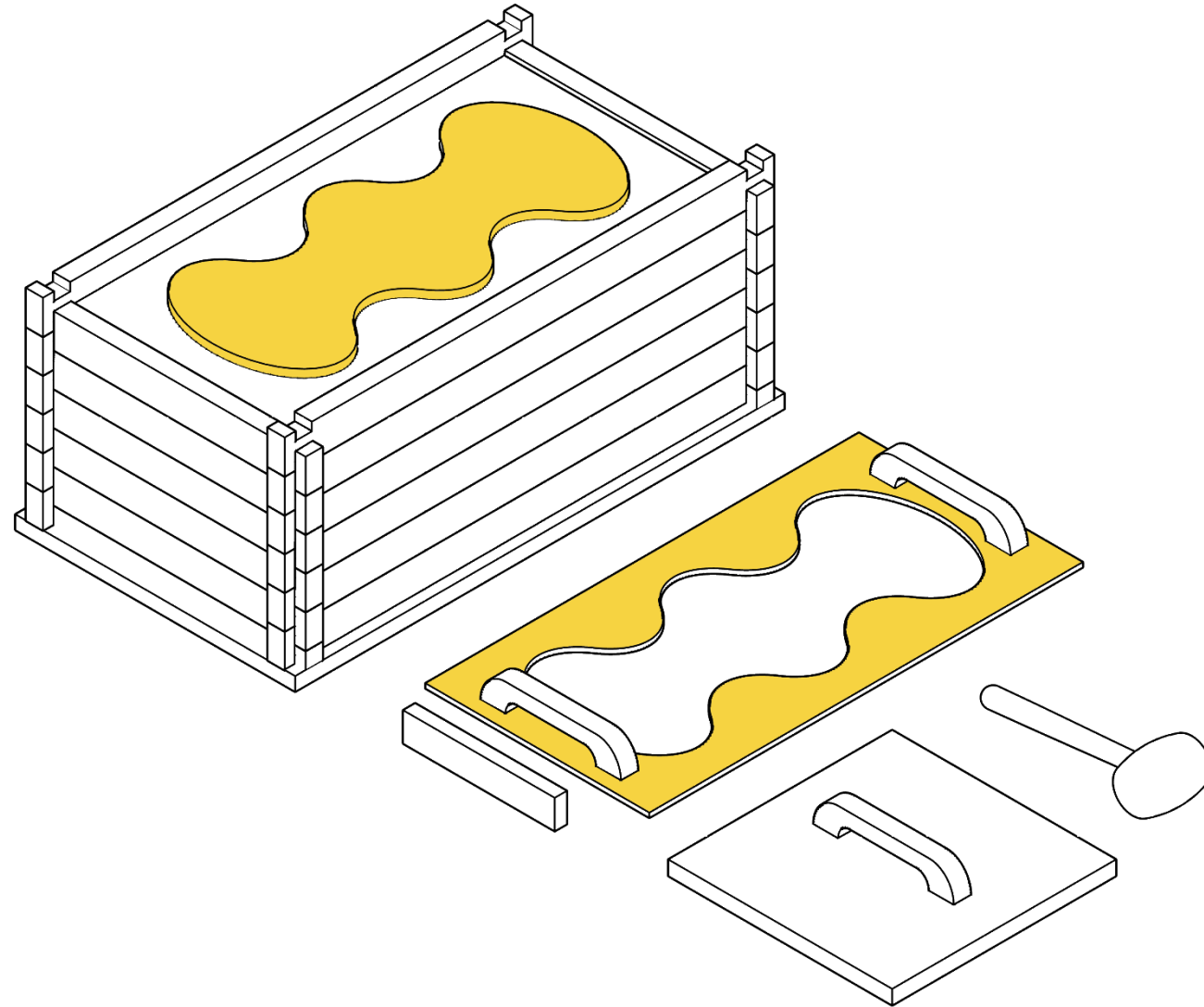
# 1. Research

Integrated seminar (3ECTS)

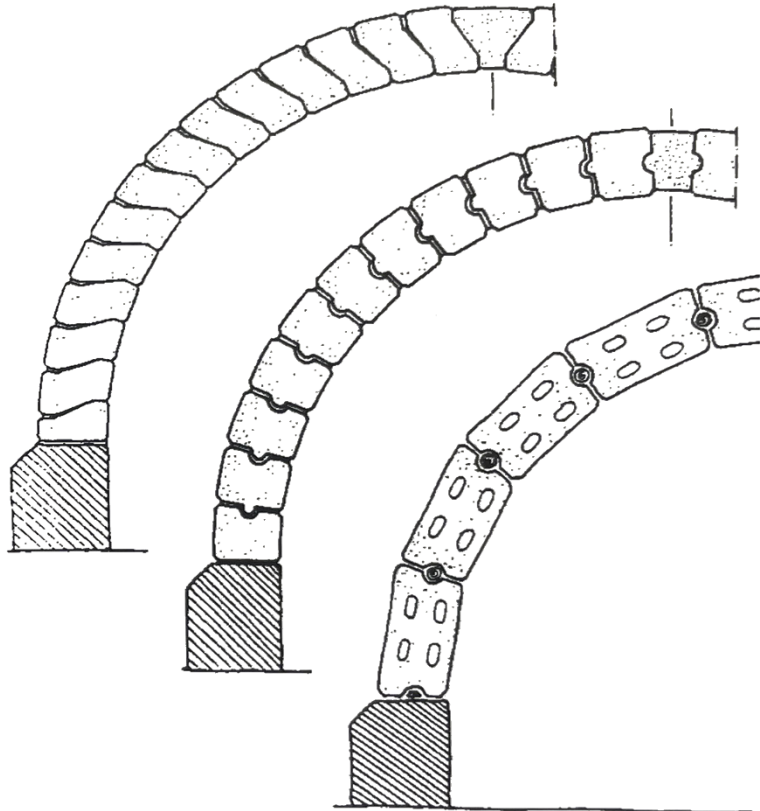




## 2. Manual material and fabrication studies



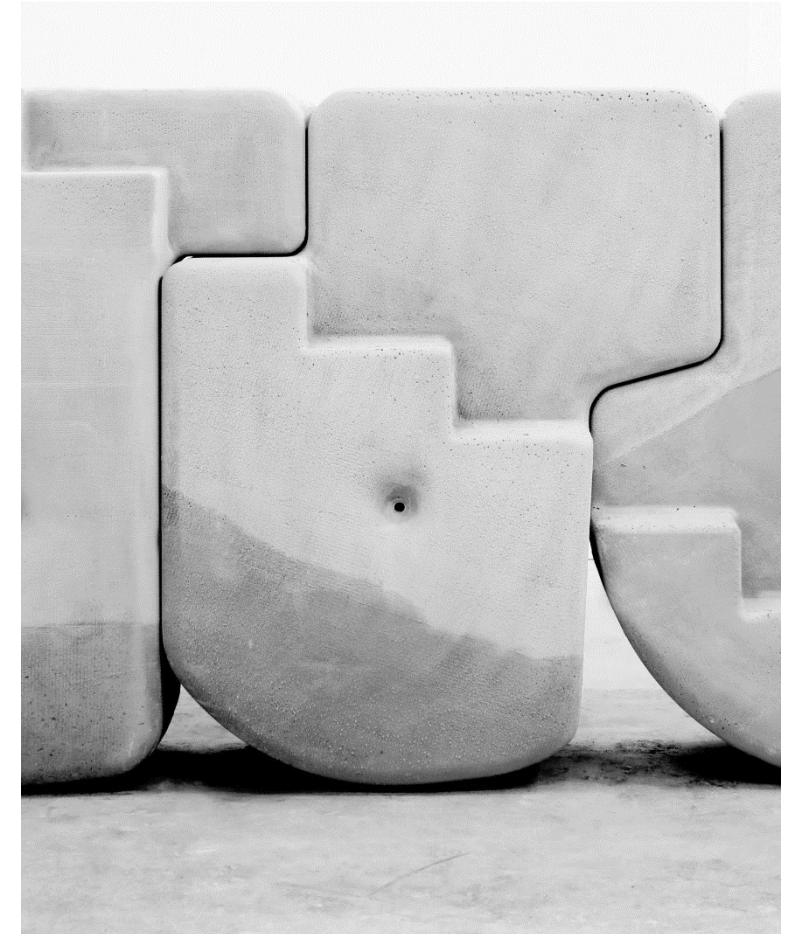
### 3. Component design



from Building with Earth / Gernot Minke / p. 68



Saloua Raouda Choucair / Poem



Brandon Clifford / Matter design

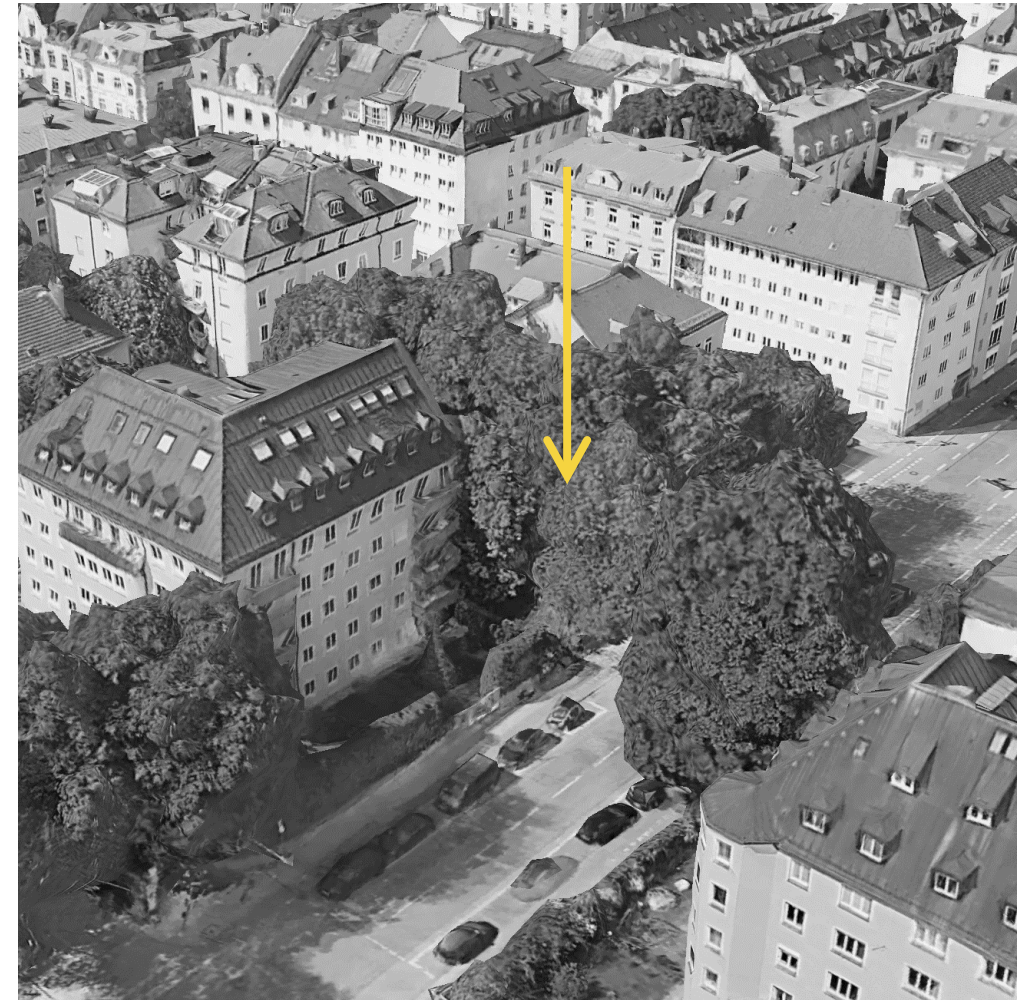


## 4. Building design

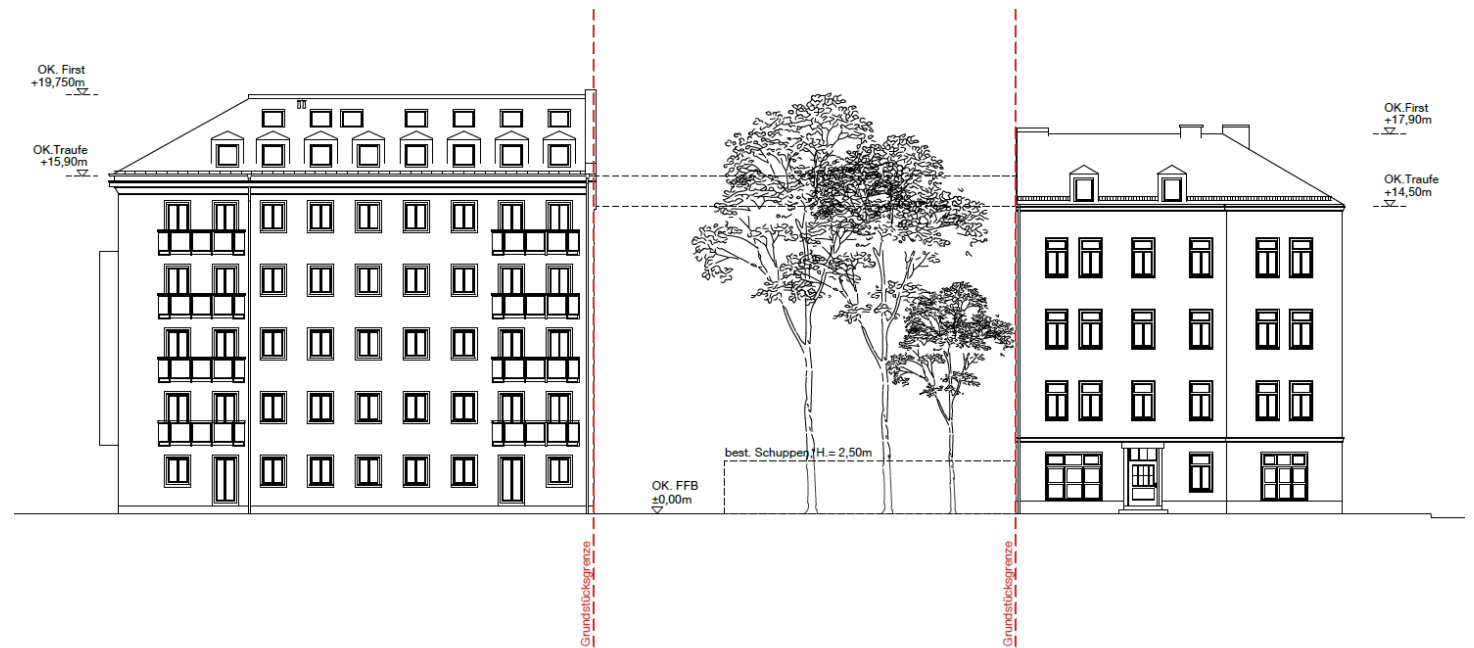
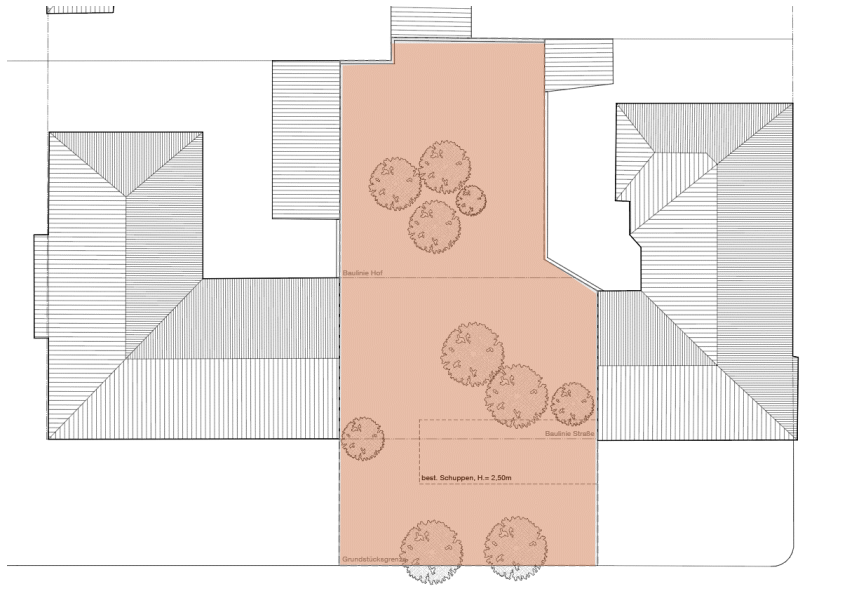
### Design of a guest house

Building gap in Neureutherstrasse, corner of Arcisstrasse

Designed, planned and constructed with, and through, the use of EAM technologies



## 4. Building design





## 5. Robotic fabrication

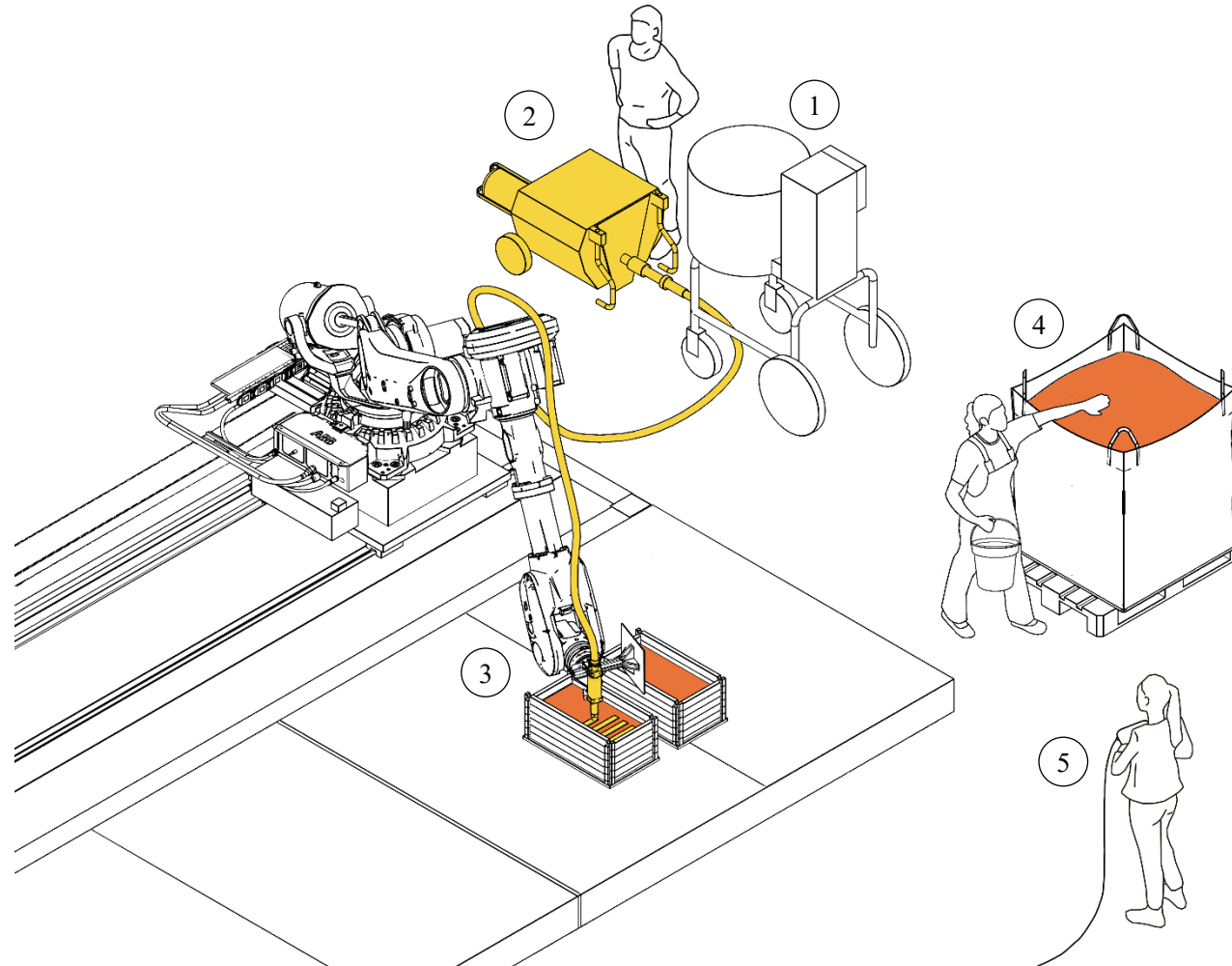
1 / Mixing

2 / Pumping

3 / Extrusion

4 / Aggregate deposition

5 / Robot control



# Input lectures and guest crits



**Sacha Cutajar** / Earth formworks  
USI (Fabrication- and Material-Aware Architecture)



**Petrus Aejmelaeus-Lindström** / Rock print  
ETH (Gramazio Kohler Research)



**Patrick Bedarf** / Foam printing  
ETH (Digital Building Technologies)



**Joschua Gossler** / Robotic rammed earth  
TU Braunschweig (Institute of Structural Design)

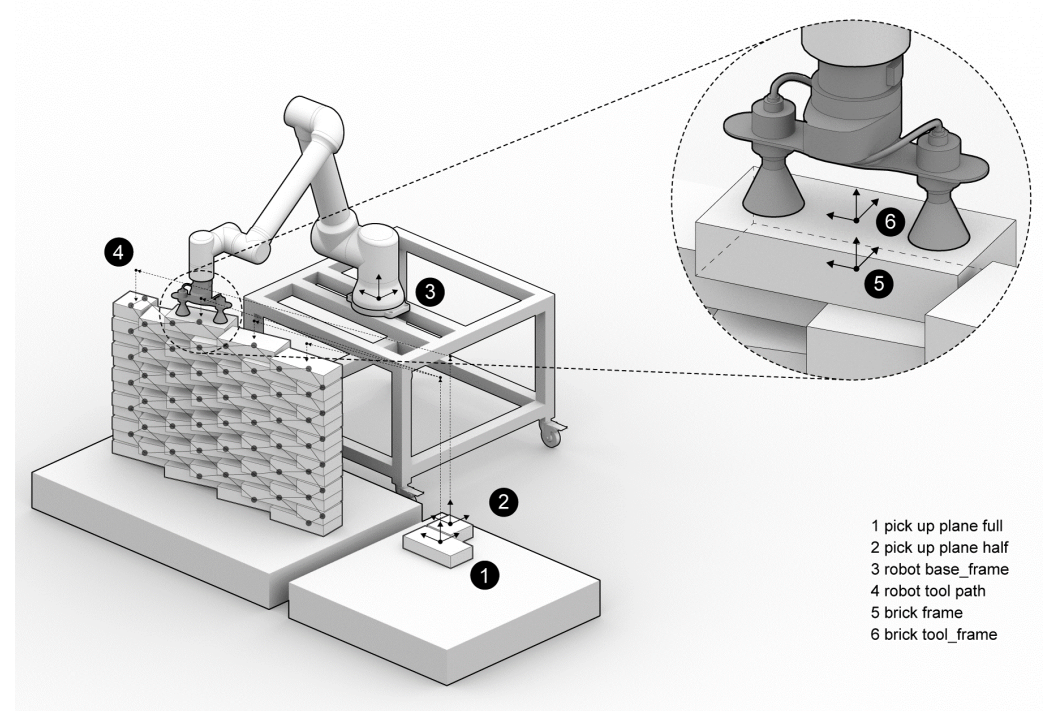


## Recommended additional seminar

### Robotic Fabrication in Architecture (taught by Begüm Saral)

6 ECTS

Wednesdays 9:00 – 12:00



# Excursion

**Tuesday, 30.04.2024**

LehmTonErde / Schlins, Österreich

95 € fee



Erden



# Organization

## Teaching

### **Professorship of Digital Fabrication**

Kathrin Dörfler , Prof. Dr.

Ema Krakovská, M.A.

## Consulting

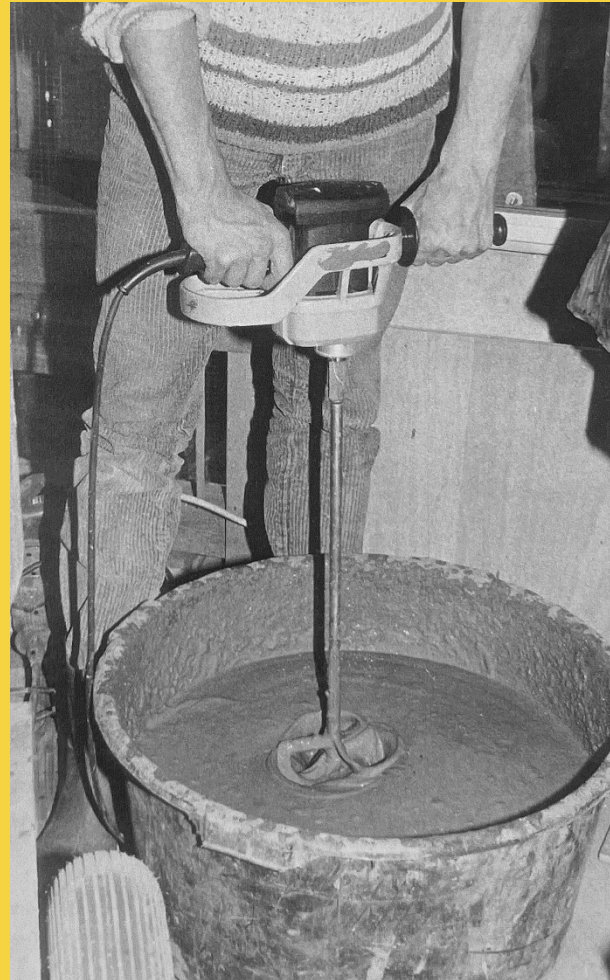
### **Professorship of Structural Design**

Prof. Dr. Pierluigi D'Acunto

In collaboration with

**Leipfinger Bader Ziegelwerke**

Meetings: **Tuesdays, 10:00-17:00h**



from Building with Earth / Gernot Minke / p. 35

Kick-off

**23.04.2024**

Materials Workshop

**26.04.2024**

Excursion

**30.04.2024**

Midterm presentations

**28.05.2024 & 18.06.2024**

Final presentation

**09.07.2024**