

# Reflection

## Introduction:

This reflection is written based upon my process during my graduation project in the Architectural Engineering Studio at the Technical University of Delft.

## Aspect 1:

*Relationship between research and design*

Research and design have always been inextricably linked to each other. I conducted many different research in order to substantiate choices in my design, varying from aspects like wildfire resilient and natural building materials to earthquake design aspects. During the first semester, my focus was on researching. The results of my research in Turkey, interviews with locals and literature readings influenced my design. After researching and seeing earth buildings in real life and feeling the earth between my hands during the site earth tests, I totally fell in love with the beauty and feel of earth houses. I knew I wanted to implement earth in my final design. Based upon local opinions and a comparison matrix, I chose for rammed earth. The aesthetic and building qualities of rammed earth really fascinate me.

During the design semester, I had to research different elements in-between sketching to see if the design would work or not. I realised I needed other materials as well if I wanted to design an innovative fire resilient village house, which led to a never-ending design-research session. I choose for natural materials like burned wood, earth insulation wool and clay boards. I realised that there is no need for materials like concrete and steel to build village houses in Turkey, the nature already provides almost everything the locals need to rebuild their houses in a wildfire resilient way. During designing, more and more aspects popped up that needed research, like retaining walls and building into self-dug slopes (since excavating local earth creates a lot of holes if you don't think about what to do with it). Also for detailing, I needed a lot of research from previous projects and books, since 'natural materials' don't really have regulations to build with.

## Aspect 2:

*Relationship between my graduation topic and studio topic, master track and master programme.*

Within the master track Architecture, my graduation topic intersects multiple aspects from the built environment like building construction, landscape and sustainability. Design and research are key tools in my project to deal with contemporary technical and social challenges in the chosen Turkish context. I wanted to challenge myself with a totally different building context than the Dutch one, which I have been designing for during my whole study career. The studio Architectural Engineering Graduation also focuses on finding technical and architectural solutions to current environmental issues. My graduation topic fits this vision of the studio. It also reflects the Harvest scope, focusing on harvesting the elements at hand and using this in the research and design. Within this scope, my graduation project crosses different elements like earth construction, local self-building practices and cultural values. I focus on self-buildable technicality, which is inseparable with the cultural norms and values of the design location. It is important to design buildings that fit the social practices of the location, since buildings influence behaviour and vice versa. Within the studio, my project touches upon interdisciplinary perspectives, which are the building blocks for my design and those are inextricably linked with each other.

### **Aspect 3:**

#### *Research method & approach in relation to the studio*

The research methods I chose for my paper provided me with a good foundation to further design with. In the beginning of the design process, I was thinking way too broad, like building every house and a community centre et cetera. This resulted in me not knowing what to do and limiting myself in focussing properly on an approachable design in the time frame we had. After talking to mentors and receiving their feedback, I let everything go and focused on one building instead of many. I focused on innovative aspects and tried to combine rammed earth and local building skills, with what I learned in my studies during the bachelors and masters. Including climate aspects, catching water and using that in favour of the fire resiliency aspect. This is where my design project started to go in a nice direction and finally, I could define my project towards P3.

I stepped outside my comfort zone during my graduation project by working with a very unusual element: voronoi-forms. It resulted in very interesting thinking sessions. I also asked myself the question why we should live in rectangular buildings and rooms, meanwhile so much more is possible. In my chosen context, I feel like rectangular forms don't match with the organic feeling of the village. Using free and organic forms gave me so much freedom within the design, but freedom also meant more difficulties and insecurities. By relating the forms into cultural furniture use and daily routines throughout the house, I was able to get my design controllable. Towards the end, I had to make a lot of choices and based them upon what matched more with the wildfire resiliency aspect, since that is the main theme. What I would have done differently is to start earlier with making choices and putting the design in a software to control the scale more, even if the design is not finished yet. I think this would have helped me with wrapping everything up more quickly.

I believe researching earth construction, specifically rammed earth construction, is important because there has been an increased popularity into it. I also recognised this during my interviews while doing the ethnographic research for my paper. I would like to use the 'down-to-earth' approach more often for designs. Also, I find it important to focus on multiple scales at the same time during the design, instead of one by one approach. For example, implementing building-scale solutions to the whole village water system.

### **Aspect 4:**

#### *Relationship between graduation project and wider social, professional and scientific framework*

Social: this graduation work aims to help village communities with rebuilding their houses in a responsible, wildfire resilient way. The local knowledge and skills on how to self-build with earth can be improved with 'simple' earth construction methods combined with innovative building methods like water catching roofs. This way, a sustainable future of living in wildfire risk areas can be provided for the villagers, as wildfire damages will be reduced with earth as the main building material and the 'wildfire closed building envelope'. In cases of unforeseen damage, the villagers will be able to repair and rebuild themselves with the sustainable knowledge on a newly introduced earth construction method. All in all, villagers will be able to return to their daily business in a responsible way.

Professional: this graduation work could help architects, designers and researchers design for the housing need in Turkish villages in wildfire risk areas. It is also generalizable for designing in other countries with the same circumstances regarding villages in wildfire risk areas. The wildfire resilient rebuilding guidelines could be used as the framework for rebuilding houses, but maybe even on larger scales and in cities.

Scientific: villages were a forgotten scale in currently available state of the art on designing for wildfire resilient communities. This graduation work adds value on the scale of villages. The water system in my project could be furtherly transferred to Turkish water management scientists to explore more in depth and apply in the mountain slope-villages in wildfire risk areas.

Environmental: I was almost forgetting about the other many great aspects that earth buildings provide (for free) when I started my graduation year, like sound insulation, thermal mass and no CO-2 emissions. I would like to share two quotes:

*Civilization is the sustainable shaping of earth into a figure that serves mankind.* - Otto Kapfinger (from "Refined earth construction & design with rammed earth", 2015, p.50)

*The envelope that surrounds us should be able to breathe and diffuse in the same way as our bodies.* -Martin Rauch (from "Refined earth construction & design with rammed earth", 2015, p.84)

All in all, the transferability of wildfire resilient building guidelines for the locals is most important: the locals can use my design and drawings to rebuild their houses themselves in a wildfire responsible way. My design introduces locals to start building with a newly introduced earth construction method and other local materials instead of low quality concrete buildings. The feel of organic and nature based materials and layout is more suited to the character of Turkish Mediterranean villages. When my design is applied to the whole village, the locals can live co-existing with future wildfires with minimal or no damage to housing and lives.

#### **Aspect 5:**

*Ethical issues & dilemmas while doing research*

One dilemma was that rammed earth construction has basically no restrictions or regulations. Also buildings in Turkish villages have no 'strict' regulations, which gave me a large play field but also made it harder to design. I constantly thought about the buildability by locals, with every choice I had to make. I also researched every product, to see if it was locally harvestable or easily available to buy from manufacturers or building product distributors.

#### **Conclusion**

As an architect, I was constantly researching, drawing and testing different scenario's, materials, lay-outs, building methods and other aspects that intrigued me. My goal was to design a project that respects local culture, is research based and wildfire resilient. My role as an architect is being the leader in the rebuilding process of the burned down villages, where I bring multiple disciplines and aspects together.

I believe my graduation project is really useful for local village builders, who still don't have wildfire resilient houses and are waiting for the government to build the low quality and almost forced houses. I have hope that the houses can be responsively rebuilt with local manpower, and that the rammed earth houses will have a great physical and mental impact on the villagers who already suffered a lot due to the wildfires and uncertainty about their village future. This graduation research and design shows the potential of introducing rammed earth in a wildfire resilient way, combined with other locally accessible materials that provide a wildfire resilient building envelope together.

#### **Literature**

Sauer, M., & Kapfinger, O. (2015). *Martin Rauch: Refined Earth: Construction & Design with Rammed Earth (DETAIL Special)* (1st ed.). DETAIL.