

# Graduation Plan for aE Studio Students

## Personal Information

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## Studio

Name of studio: Architectural Engineering

Teachers: Mo Smit, Marcel Bilow

Argumentations of choice of the studio: Inspired by an essay by Thijs Asselbergs (The New Architect: Integrating innovation into architectural assignments; in search of a new role), which highlights the need for knowledge of construction and innovation. The quote "The architect is therefore (if the young designer doesn't know any longer how to construct his/her images) at risk of becoming a producer of images that need to be built and materialised by third parties." stuck and resonated with me. This is also something I have experienced at several architecture firms I have worked at. The more knowledge the architect had of methods of construction and on material use, the more fruitful the dialogue with the contractor seemed to be.

## Title

Rethinking Migration: redesign of a reception and identification camp for refugees on the Aegean island Moria, Greece.

## Graduation Project

### Problem Statement

In short, the problem with RIC Moria was that it was in extremely poor condition. This means the following.

On an architectural scale, tents and other shelters provided by NGOs and UNHCR, and improvised shelters by refugees due to overcrowding, are not able to cope with the climate. Winter temperatures on Lesbos island vary between a low average of 3 °C and high average of 11 °C. Summer temperatures vary between a low average of 17 °C and high average of 34 °C. With extremes ranging from -7 °C to 39 °C. (meteoblue, 2020) Flooding is a regular problem, tents blowing away and mud on the passages between tents. (ANSA, 2020; Grant, 2020) Which means in winter is extremely cold in their shelters. Since most of the shelters lack electricity, active cooling is not an option, and airflow through the tents is needed for cooling. These shelters also lack any transition from public to private. These circumstances are detrimental to the mental health of refugees which in most cases already needs attention. (International Rescue Committee, 2018) These mental health problems are also exacerbated by the fact that people in these camps have no chance to partake in activities throughout the day and are completely dependent on others. (Bjertrup et al., 2018)

On an urban scale the camp is segregated and isolated from its surroundings. Consequences of this segregation is the lack of economic exchange and social integration

of the camp with its surroundings. (Werker, 2007) One of the reasons for this, is that refugee camps are viewed as something temporary, (while in reality, refugee camps can be classified as permanent), alien to its surrounding, in which humanitarian aid is provided, with decisions for design being made top-down.

### **Objective**

Developing a RIC which allows for (economic) activity by the refugees and fosters interdependence with its surroundings, allowing for exchange of goods and services. The dwellings should allow for possible services/activities to be executed, and be climate appropriate. Ideally, refugees could be involved in the process of construction.

This project can highlight a different approach to designing refugee camps from the way it is done now, and how architecture could contribute to a refugee camp beneficial for the health of the refugee and its surroundings, addressing the problems mentioned. It can be a small part in the larger discourse of refugees, inciting a different look and proposing a different model on the whole matter.

### **Overall design question**

How to redesign the layout and shelters of Reception and Identification Camp Moria, Lesbos, into a sustainable, affordable and climate appropriate design, fostering economic activity and interdependence with its surroundings?

### **Thematic Research Question**

What are the possibilities of using straw as a building material to create climate appropriate, affordable, low-tech, self-buildable dwellings?

- What are the building physical properties of straw?
- What construction methods for building homes with straw do exist?
- What types of cereal crops are most suited to gather straw for the purpose of building?
- How much straw and cultivated land of cereal crops are required to meet the need for the aforementioned construction methods?

### **Methodologies**

The goal of the Thematic Research is to create an understanding of the possibilities of using straw as a construction method and the construction process, in relation to affordability, low-tech and self-buildable.

This Thematic Research will be descriptive, and the conclusion of it will be used as a tool for selecting building methods and further research into the possibilities of applying straw in refugee camps. This will be a mix between a qualitative and quantitative research, belonging to the make and flow research-by-design domain. The first part, sub-questions one and two of the Thematic Research, studies the aspect of construction with straw. The second part looks at the origin of the building material, understanding the different types of cereal crops/straw, quantifying straw yield from cereal crops and straw usage for the different types of construction methods.

The terms affordable, low-tech and self-buildable will be qualified in the first part of the research. There are many variables which go into the make-up of the total cost of a house. This makes it impossible to take the whole house into account when talking about affordability. For this research, affordable will be qualified by looking at building material cost of straw as an insulation material (and when used as a loadbearing wall, also as the structural material for the wall) versus most common insulation material. This can be looked at in combination with workload to construct the wall in hours and the need for professional contractors. The last part of professional contractors in combination with the need for professional equipment will also be the measure for qualifying low-tech and self-buildable.

Through literature review including books and journal articles on construction methods and on building physical properties of straw bale buildings the first and second sub-question will be answered. For the first question, the data of the building physical properties of straw will be compared to the Greek building code, to see whether they meet the standard required for single storey residences. In this segment, affordability and potential for climate appropriate design on Lesvos will be discussed. For the second question, differences between the various types of construction methods and their intricacies will be discussed. These intricacies will consist of, low-tech and self-buildable as defined in the first part of the thematic research.

The third question will be a short segment in the whole. It will result in a list of most suitable cereal crops. Literature reviews on most used straw for buildings and their properties and climate requirements for growing will be conducted.

After this, a quantification of the flow of straw will be made through analysing existing data on straw yield for the analysed, which is in kilogram (or kilotons) per land unit (hectare). Another part is calculating the amounts of straw needed to build different types of wall, the unit for this is usually  $\text{kg}/\text{m}^3$ .

The result will ideally be an understanding on straw yield per type of straw per unit of cultivated land (example square metre) and how this amount of straw corresponds to the building of square metre of walls. Together with the previous findings, an understanding of how much cultivated land for how much wall for the different types of construction is developed.

## **Planning**

See last page for planning

## **Relevance**

The need to provide for shelters which provide comfort in terms of temperature to improve the mental health of the refugees, is clear. What's more, Killian Kleinschmidt, a prominent figure in the world of aid workers working over 25 years (1992-2014) as a United Nations official mostly under the UNCHR (United Nations High Commissioner for

Refugees), argues for a change on matter of dependence by the refugee. He argues that refugees should be able to be (economically) active, and shelters should be able to accommodate for this, and that economic integration could be beneficial for both refugees and host-country. Besides this, he observed the need for privacy and flexibility in shelter design, for the refugee to make their home. (Kleinschmidt, 2020) Bjertrup et. al. have found that having lack of control, no activities besides waiting to receive aid, and isolation from surroundings are cause for psychological distress. This calls for a different approach in refugee camp design. Jahre, Kembro, Adjahossou, & Altay, (2018) dive into this in their study of approaches to refugee camp design. Going from a top-down to bottom-up approach in the design process, in which not only refugee but also host-community are involved, has positive effects welfare, wellbeing and economics for refugee and host country. For the refugee it increases their mental health and independence from aid, for the host-community it can have a positive effect on economics. In this, resource sharing is important, from services of the refugee to material from the host community, according to Kleinschmidt. (Radford, 2015) Providing spaces like markets in strategic points, accessible by refugee and host-community, and spaces in houses to provide these services is a step in this direction. (Jahre et al., 2018) Werker (2007) also argues for less segregation for the purpose of economic and social integration, in which decreasing barriers between camp and surroundings, and placing a camp near urban places is a step in the right direction.

## Literature

- ANSA. (2020, 15 December 2020). Greece: Government criticized as 'Moria 2.0' flooded again. Retrieved from <https://www.infomigrants.net/en/post/29102/greece-government-criticized-as-moria-2-0-flooded-again>
- Bjertrup, P. J., Bouhenia, M., Mayaud, P., Perrin, C., Ben Farhat, J., & Blanchet, K. (2018). A life in waiting: Refugees' mental health and narratives of social suffering after European Union border closures in March 2016. *Social Science & Medicine*, 215, 53-60. doi:<https://doi.org/10.1016/j.socscimed.2018.08.040>
- Grant, H. (2020, 17 Januari 2020). 'Moria is a hell': new arrivals describe life in a Greek refugee camp. *The Guardian*. Retrieved from <https://www.theguardian.com/global-development/2020/jan/17/moria-is-a-hell-new-arrivals-describe-life-in-a-greek-refugee-camp>
- International Rescue Committee. (2018). *Unprotected, Unsupported, Uncertain*. Retrieved from <https://www.rescue.org/report/unprotected-unsupported-uncertain>
- Jahre, M., Kembro, J., Adjahossou, A., & Altay, N. (2018). Approaches to the design of refugee camps: An empirical study in Kenya, Ethiopia, Greece, and Turkey. *Journal of Humanitarian Logistics and Supply Chain Management*, 8(3), 323-345. doi:10.1108/JHLSCM-07-2017-0034
- Kleinschmidt, K. (2020) *Refugee Cities and SDZs/Interviewer: Startup Societies Foundation*. Startup Societies Foundation.
- meteoblue. (2020). Climate Lesbos Island Retrieved from <https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/lesbos-island-greece-258466>

Radford, T. (2015, 23 November 2015). Refugee camps are the "cities of tomorrow", says humanitarian-aid expert. *Dezeen*.

Werker, E. (2007). Refugee Camp Economies. *Journal of Refugee Studies*, 20(3), 461-480. doi:10.1093/jrs/fem001

NB. Part of the graduation (especially in the MSc 4) is the technical building design. Therefore a Building Technology teacher will be part of the tutoring team from the P2 presentation on. This should be taken into account when writing the Graduation Plan, in the time planning as well as in the relation to the content (e.g. statement, method and /or relevance).