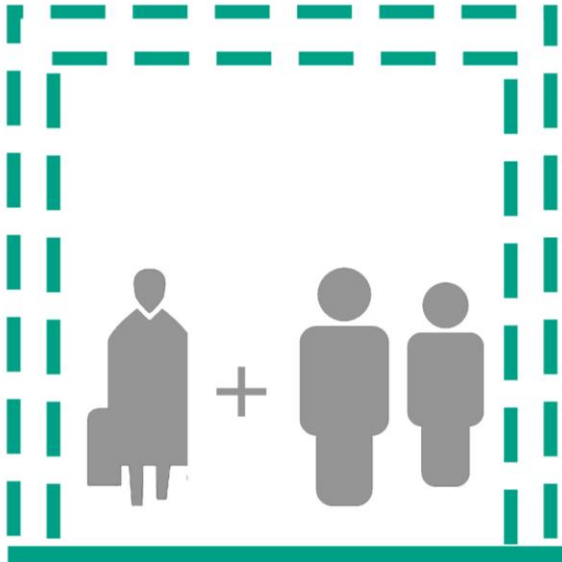


# AE Graduation Plan



## Personal Information

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## Studio

Name of studio: Architectural Engineering  
Teachers: Job Schroën  
Pieter Stoutjesdijk

Argumentations of choice of the studio:

*The combination within this studio of technique and design really attracted me. During my MSc 2 doing the extreme studio I realised this kind of architecture is the one that suits me best. Not only design, but at the same time think about how to construct the building you design. Besides this the wide variety in this studio attracted me, as you can choose from many different locations and create your own personal graduation project yourself.*

# Adaptable community centre for residents of the neighbourhood and refugees

## Problem Statement

A problem that exists for a very long time is the integration of refugees into the community. Research (Planbureau, 2011) conducted in 2009 about the refugee groups coming from Afghanistan, Iraq, Iran and Somalia shows the problems we are going to face with the big stream of refugees the coming years. First problem is the civic integration problem, because refugees that follow the integration program feel like the learning of the language mainly happen in their daily life (Planbureau, 2011). The second and biggest problem of integration is the high unemployment rate. In 2009 only around 30% of the Somali refugees found a job, the Iranian refugees have the best result with almost 50%, but that is still low (Planbureau, 2011). The problems of not finding a job relays in four factors; poor health, time spent in the Netherlands, poor command of the Dutch language and foreign qualifications which are not accepted on the market (Planbureau, 2011).



Figure 1: Problems of refugees (Own Illus.)

Next problem that needs to be improved is the static use of buildings. Most buildings are not able to grow with the changing users need in a relative short time period. If a building is only made for one function, like offices or a public function that is all that they will be used for until the function becomes unnecessary. At the moment we have seven million m2 of vacant office space in the Netherlands (Gijzel,2016). The problem is that they are not adaptable to the needs of now and the future. As you can see in the table, within 5 years the user will likely change the function of the existing space and within 5-10 years even another user with different function can come into the building. The building should be able to respond to these changes (Gijsbers,2011). A flexible approach to our buildings is necessary for a wide range of reasons: changing family size and groupings, lifestyle issues and remote working. An architecture that is fully adaptable to this fluctuating living and working pattern is needed (Kronenburg,2007). The building system therefore has to be adaptable to the changing needs over time.

Typology of change	Time Span
Trends	daily
Space destination within function	+/-1 year
Spatial layout within function	+/-5 years
Upgrade finishing	+/-5 years
Change user-function	+/-5-10 years
Upgrade comfort	+/-15 years
Functional and spacial change	+/-15 years

Figure 2: Typology of change (Own Illus.)

## Objective

*The aim of my graduation project is to make an adaptable community center for permitted refugees and residents of the existing neighborhood around the Marineterrein.*

The main goal from the user perspective is to make the integration of the permitted refugees into the community go faster. That is the reason why the community center will be designed for the permitted refugees and residents around the Marineterrein, so that the refugees can interact with Dutch people from day one. To be able to fasten the integration the community center should adapt to the different needs throughout the day and in the coming years. The community center will be the key factor in the integration of the permitted refugees with the existing residents.

To make a building that is future proof and can adapt to the changing needs of the users there are two other goals the building needs to fulfill; CNC fabricated and bio-based materials.

First of all the solution should be made of bio-based materials, in order to reduce the harmful effects of materials used nowadays. The building industry accounts for 30% of carbon dioxide emissions, which show an unsustainable industry (Ganotopoulou,2014). It is evident that current building industry plays a big role in the environmental problem. Consequently, building practices should be modified in order to achieve an eco-efficiency of the construction industry. "Architects are the major energy users though the specification of material and components" states Dean Yvonne. They have to make sensible design decisions in terms of limiting the energy demand of the building by its performance and by considering the energy needed in the processing and transportation of materials. Therefore, architects should carefully take into account the desired lifespan of a building's component. A life-cycle of 15-20 years by using materials with less environmental impact, gives a sustainable design solution to the changing user's needs for new architectural typologies during time. Bio-based materials are a design answer towards this, since they can allow a short life-cycle without the environmental impact of construction and demolition waste of the non-biodegradable materials. Moreover, they are made from natural renewable resources and the majority needs low amount of energy for their production (Ganotopoulou,2014).

Next to the environmental impact, building construction is a cost intensive process due to the necessary levels of manual labor. Industrial prefabrication has been carried out to build more economically and more efficiently. The next step is the new approach to industrial construction, based on the application of computer-based production methods that promise an increase in the amount of creative freedom. The combination of industrial fabrication and manual building techniques result in an interesting aspect for high-quality, economical construction. Therefore a CNC fabrication method will be used to construct the building. The application of CNC production processes means the computer-based control of cutting and milling machines. This system enables variable and differentiated serial manufacturing techniques. Building elements can be easily constructed with CNC milling machines. It will be a new challenge to design and implement constructions with this technology (Dorrhofer,2008).

## Overall design question

How to make an **adaptable community centre** for the residents and permitted refugees that will fasten the integration process and upgrade the neighbourhood at the Marineterrein in Amsterdam now and in the future?

## Thematic Research Question

How to design a building system that can **adapt** to the **changing needs** of the permitted refugees and residents in a **bio-based** and **CNC fabricated** manner?

## Sub-questions

1. What method should be used to design a building system?  
- literature
2. What are the needs for refugees to fasten the integration process?  
- literature
3. What are the needs of the residents at Amsterdam Eastern Islands?  
- literature+ context analysis
4. What will be the final program of the community centre based on the different needs of both user groups over time?  
- research by design
5. What will be the design problems of the building system in terms of:  
-Program of the design  
-Construction of the design  
-Climate requirement  
-Architectural requirements  
- literature
6. What will be the different criteria for the building system regarding the wanted flexibility and needs of the users?  
- case studies + literature
7. What will the different CNC fabricated and bio-based solutions be for the design problems?  
Sub-questions: - Why CNC fabrication?  
- Why bio-based materials?  
- case studies + literature+ research by design
8. What will become the best concept to make an adaptable building system?  
Sub-questions: - What are the best solutions for the design problems?  
- Which different concepts can be generated?  
- Which concept is the best compared to the others?  
- literature+ research by design

## Relevance

Right now there are 46.391 refugees in the Asylum seeker centers in the Netherlands(COA, 2016). From 17.000 refugees that entered the Netherlands between January and August 2015 70% of them got a permit(Oving, 2015). All those refugees will eventually be a part of the community.

The task of 2016 will be the integration of all those permitted refugees, because a fast integration of refugees will prevent unemployment. On the other hand we shouldn't forget about the residents who already live in the neighborhood of Amsterdam for a long period. Often they are scared of a big population of refugees being placed into their community. A lot of progress can be made regarding the interaction between residents and placed refugees (Hollands,2006). To make the integration of the refugees go faster they need the right facilities at the right moment. So we need a flexible living environment that will make the integration go faster and result in a more accepting community. A community center for all the people, where you can follow an integration process but also have other activities as a catalyst for integration with the neighborhood, can make this possible.

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