Graduation Plan for AE students
Version 03.07.2018

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Studio
Architectural Engineering  INTECTURE
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Research  Thaleia Konstantinou
Technology  Paddy Tomesen

Argumentations of choice of the studio
This studio encourages students to search for social issues and make a design integral with a certain
technology. This makes the design more relevant. Approaching it from the technology makes it more
substantiated.

Title
Connecting post-war walk-up apartments to local closed flows

Problem Statement
Cities consume energy, water, food and materials, leaving a heavy ecological footprint. Our current way
of consuming is too big of a burden for the planet and isn’t something we can keep up for the coming
decades. Today cities are for 95% dependent on external resources. Going on in this line of action our
natural resources will run out eventually, probably even within this century. This means a major shift in
acting and thinking is needed. Instead of a linear economy, where we take, make and dispose, we should
transition to a circular economy where material, products and waste are reused, recycled or refurbished
and where physical (e.g. water and food) and energy flows become closed circuits. In the most ideal
situation this leads to a world without waste.

Currently we still need lots of green lands to produce enough food for the world population. More and
more land needs to be cultivated to provide the ever growing population. We should treasure the
untouched existing green structures and therefore it seems logical that most urban development will only
take place within the existing networks, within the ageing city that no longer meets the current quality
standards (Hereijgers & Van Velzen, 2001). “The transition from unsustainable cities to more sustainable
and resilient cities must gradually develop in an evolutionary way where today’s open and global systems
for energy and materials will be complemented by what has been referred to as more local and regional
‘short circuit economies’ that facilitate local social cohesion as well.” (van Timmeren, 2014). No waste
means that the existing substandard housing also shouldn’t be considered waste, but as a resource for
urban resilience. Thus the urban environment seems an important starting point to transition to a more
circular world. Even more when you consider the fact that the building sector (households and services),
with approximately 40%, is the biggest energy user in Europe (Eurostat, 2015).

One third of our urban building stock has been built after the second World War, between 1945 and
1975 (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016). During the war 86.000 (from
which 25.000 in Rotterdam) were destroyed. Another 336.500 were heavy or lightly damaged (Blom,
Jansen, & Van der Heiden, 2004). Repair of war damage and the enormous increase of the Dutch
population (from 8.8 million in 1940 to 12.9 million in 1970), the so called baby boom, were reasons for
the huge housing shortage (Blom et al., 2004). One of the new developed types that was built in this
period is the ‘portiekflat’, or in English the walk-up flat. They were built in a repetitive way to be able to
realise many dwellings in a short period of time. In Rotterdam 23.9 % of the building stock consists of
these post-war walk-up flats (gemeente Rotterdam, 2017). This building stock is not nearly rising up to
the current standards of sustainability. They have many issues like cold bridges, high energy demand,
poor sound insulation, accessibility and cramped spaces. But also on urban scale there are some issues,
the differentiation of the buildings and dwellings is low, low percentage of facilities and the quality of
the green is not that good (Battum, 2002). Of course there are also positive sides to these post-war
neighbourhoods. They are often connected really well to the city centre, main roads and the public
transport. The quality of the green might not be that high but the trees are fully grown and the public space is quite spacious (Blom et al., 2004). A good example of such a neighbourhood is Carnisse in Rotterdam. This neighbourhood even counts almost 70% of walk-up flats and was designed by Jo van den Broek.

This post-war building stock, which is such a big part of the total building stock, will need to be addressed by the government, urban planners and architects in the coming years to prepare them for the future. Thinking in a sustainable and circular way, it doesn’t make sense to demolish and replace them. Cities and neighbourhoods should be more focussed on local and regional short circuit economies in order to achieve sustainability and resilience towards changes in the future. Neighbourhoods could become self-sustaining and resilient by integrating, connecting and closing different material and energy cycles. The post-war building stock shouldn’t be considered waste but an integral part of the cycles.

Objective
Post-war neighbourhoods need to be addressed to prepare them for the future. To make them self-sustaining and resilient on a local level the different infrastructures (physical and energy flows) like, water supply, waste treatment, solid waste treatment, energy supply, food supply and transportation should be integrated to create closed cycles. With this graduation I intend to research which energy and material cycles exist, how they work, what needs to be added to implement them into existing neighbourhoods. The housing in these neighbourhoods need to be compatible with that. A thorough research of the walk-up flats is needed to determine their current status and the measures that need to be taken to integrate them in the neighbourhood. This will lead to a redesign of the walk-up flat that fits the new the self-sustaining and resilient neighbourhood.

Overall design question
How to redevelop the neighbourhood Carnisse, connecting the loops of different types of streams (flows) on a local level, while improving differentiation in housing and functions and the quality of the dwellings and the public space, transitioning it into a self-sustaining and resilient neighbourhood for the future?

Sub questions:
- What is the existing situation of flows in Rotterdam, Charlois, Carnisse?
- What flows are needed to make a self-sustaining and resilient neighbourhood?
- Which flows can I connect to? (harbor, waste treatment plant)
- What role does the dwelling play within these flows?
- Which design interventions/structures/installations are needed to facilitate the new flows?
- How to improve the differentiation and spatial quality in a sustainable way?
- What are the strong and weak points in the neighbourhood?

Thematic Research Question
What interventions are needed in the post-war walk-up apartments to improve their current performance and connect them to different types of local streams (water, waste, energy, nutrients, materials) in the neighbourhood?

Sub questions:
- What is the current constructive status of the ‘portiek’ dwellings in Carnisse?
- What is their social and heritage value?
- What is the existing situation of flows in Rotterdam, Charlois, Carnisse?
- What flows are needed to make a self-sustaining and resilient neighbourhood?
- What interventions are needed to make these dwellings compatible to the neighbourhood?
- How can these interventions contribute to the architectonic expression of the buildings?

Methodologies
- Literature research about closed loops
- Analysis of the site and its current flows
- Reference studies on projects with integrated/closed cycles
- Literature study of the history and value of the ‘walk-up’ flats
- Analysis of the post-war building stock, construction and value
- Reference studies on post-war refurbishment designs

**Relevance**

Current way of consuming energy, materials and food does not withstand the future. New ways of living need and strategies on how to deal with this need to be developed. Resilient and self-sustaining neighbourhoods can play a big role in achieving this. The post-war building stock is almost one third of the total urban area. It’s unlikely that all of these buildings will be demolished and replaced by new ones. Redeveloping and integrating them into closed cycles will be a great task in the coming years. The strategy and design that will be developed in this graduation project could be a framework for other neighbourhoods with the same kind of housing.

**Planning**

**GRADUATION SCHEDULE**

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**CHRISTMAS HOLIDAYS**

**SCHOOL BREAK**
Literature


