

# Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



## Graduation Plan: All tracks

| Personal information   |                              |
|------------------------|------------------------------|
| Name                   | Ruben Wessels                |
| Student number         | 4103211                      |
| Telephone number       | .....                        |
| Private e-mail address | r.wessels@student.tudelft.nl |

| Studio                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name / Theme                          | Architectural Engineering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Teachers / tutors                     | Design tutor: Monique Smit<br>Building technology tutor: Maarten Meijs<br>Research tutor: Siebe Broersma                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Argumentation of choice of the studio | The technical aspects of architecture has always interested me. One of the things that attracted me to study architecture in the first place was the mixture between design and technique. Furthermore has sustainability in architecture in its whole been of an interest to me and especially the performance of a building during its period of use. After I learnt that the graduation studio of Architectural Engineering offered me the freedom to fully define my graduation project myself, so that I could define a project with a technical focus on sustainable building performance while also maintaining all the other aspects of architectural design and even incorporate other personal fascinations such as the implementation of old existing buildings or structures in a new architectural designs, my choice for the studio was easily made. |

| Graduation project              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title of the graduation project | <b>Fix-up the Walk-up:</b> The renovation of 1960's walk-up flats into social and energy-efficient fix-up dwellings / De renovatie van Jaren '60 portiekflats tot sociale en energiezuinige kluswoningen                                                                                                                                                                                                                                                                                                                                                                          |
| Goal                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Location:                       | IBA Parkstad, Limburg (Hoensbroek)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| The posed problem,              | The IBA Parkstad area is a region with a rich and vibrant history. It once was the 'energy centre' of the Netherlands and known for its coal mining. However, things have changed. The mines have since been closed and the area has lost its identity. Also, the area has to deal with problems as population ageing, population decline, an outdated building stock and a large scale building vacancy. In most cases these vacant buildings have a bad energetic performance due to for instance bad insulation, insufficient building quality, bad solar orientation, lack of |

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          | solar shading and energy spilling ventilation systems. This creates a large ecological footprint and results in high energy costs. The large scale building vacancy, together with a high unemployment percentage and the loss of a regional identity due to the closing of the coal mines also has a decline of the social cohesion in the area as a consequence.                                                                     |
| research questions                       | <p><b>Overall research question:</b><br/>How can existing walk-up flats in the IBA Parkstad area be redesigned into attractive and comfortable energy neutral dwellings, while also improving the social cohesion in the neighborhood?</p> <p><b>Thematic research question</b> (for research paper):<br/>In what ways can an existing walk-up flat, dating from 1960's, be made energy neutral, and which ways are more suitable?</p> |
| design assignment in which these result. | The goal of this graduation project is to create a redesign for an existing walk-up flat in the IBA Parkstad area. Besides a sufficient design in all common fields of architecture, the objective focuses on a realization of an energy neutral design and on the social improvement of the neighborhood, while staying both comfortable and attractive.                                                                              |

## Process

### Method description

#### The to be used methodologies during the research and design process are:

Literature studies on the topics:

- Energy neutral buildings
- Energy labels
- Passive heating, cooling and ventilation
- Sustainable active heating, cooling and ventilation
- Renewable energy
- Renovating bad energetic buildings
- Social community architecture

Case studies/reference study on the topics:

- Energy neutral buildings
- Renovated bad energetic dwellings
- Redesigned walk-up flats
- Fix-up dwellings (kluswoningen)
- Materialization

Discussion/consulting/brainstorming with:

- Monique Smit, about overall design
- Siebe Broersma, about energy neutrality and building performance
- Maarten Meijs, about building technology

Research by design, in the form of:

- Overall design sketching
- 3D modelling

- Physical modelling

## Literature and general practical preference

### Literature:

- Agentschap NL. (2011). *Voorbeeldwoningen 2011: Bestaande bouw*. Sittard: Agentschap NL.
- ENDIS. (2011). Endis portiekflat renovatie. Retrieved 9 June, 2015, from <http://www.endis.nl/endis-portiekflat-renovatie/aanleiding/170-aanleiding2.html>
- Garritzmann, U., Poiesz, P., & Snijders, K. (2015). Kansen voor de naoorlogse portiekflat: Het specifieke van de middenniveau renovatie. Rotterdam.
- Groenewegen, P. P., Van den Berg, A. E., De Vries, S., & Verheij, R. A. (2006). Vitamin G: effects of green space on health, well-being, and social safety. *BMC public health*, 6(1), 149.
- Kristinsson, J., & Dobbelsesteen, A. A. J. F. (2012). *Integrated Sustainable Design*. Delftdigitalpress.
- Vloet, F. (2014). Klushuizen verbeteren leefbaarheid in kwetsbare wijken. Retrieved on 30 april, 2015, from: <http://www.denieuwedraai.nl/klushuizen-verbeteren-leefbaarheid-in-kwetsbare-wijken/>
- Wakefield, S., Yeudall, F., Taron, C., Reynolds, J., & Skinner, A. (2007). Growing urban health: community gardening in South-East Toronto. *Health promotion international*, 22(2), 92-101.
- Woude, H. V. D., & Dorst, M. V. (2012). *Community architecture in Nederland*. Bussum: Thoth.
- Yanovshtchinsky, V., Huijbers, K., & Dobbelsesteen, A. v. d. (2013). *Architectuur als klimaatmachine: Handboek voor duurzaam comfort zonder stekker*. Amsterdam: SUN.

### Precedents/Case Studies:

- Vanschagen Architecten. (2014). *Klussen op de Klarenstraat*. Amsterdam. Retrieved 27 March, 2015, from <http://www.urbannerdam.nl/werkvelden/projecten/klussen-op-de-klarenstraat/>
- hp architecten. (2013). *Renovatie portiekflats*. Rotterdam. Retrieved 7 April, 2015, from <http://www.hparchitecten.nl/portfolio/renovatie-portiekflats/>
- Archivolt architecten. (2010). *De Koningsvrouwen van Landlust*. Amsterdam. Retrieved 30 April, 2015, from <http://www.kennishuisgo.nl/voorbeeldprojecten/ProjectPage.aspx?id=699>
- Frencken-Scholl Architecten. (2004). *Lienaertsstraat appartementen*. Geleen. Retrieved 1 May, 2015, from <http://www.kennishuisgo.nl/voorbeeldprojecten/ProjectPage.aspx?id=242>
- KOW Architecten. (2011). *Passive House renovation Nieuwkuijk*. Nieuwkuijk. Retrieved 30 April, 2015, from <http://www.kennishuisgo.nl/voorbeeldprojecten/ProjectPage.aspx?id=830>

