

# Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



## Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners ([Examencommissie-BK@tudelft.nl](mailto:Examencommissie-BK@tudelft.nl)), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Maxime de Ridder-Le Creurer
Student number	4218620

Studio		
Name / Theme	Architectural Engineering / Second Life	
Main mentor	Elise van Dooren	Architecture
Second mentor	Engbert van der Zaag	Technical Building Design
Argumentation of choice of the studio	<p>When orientating for a career in high-school, I chose architecture because of the combination it would offer between technical challenges and creativity, while giving me the space to explore my fascination for bio-climatic design. Especially after discovering more about it, the chair of Architectural Engineering studio seemed like the perfect place to close my academic path.</p> <p>During my studies, I have discovered the challenge in making the large stock of existing buildings future proof and have come to find it more appealing and mostly more relevant than that of designing a sustainable building from scratch, hence my choice for the Second Life studio.</p>	

Graduation project	
Title of the graduation project	A naturally ventilated re-design of the research facility of the Amsterdam Medical Center.
Goal	
Location:	AMC hospital Meibergdreef 9 1105 AZ Amsterdam (NL)
The posed problem,	The existing layout doesn't suit the current vision on teaching and research in the field of medicine; the current climate system is energy consuming and ill-adapted to user comfort as well as to future-proof sustainability standards.
research questions and	How to choose a natural ventilation concept to retrofit on a large-scale building?

design assignment in which these result.	A re-design of a part of the AMC building that meets the needs of the researchers, while being naturally and passively ventilated and regulated.
<b>Process</b>	
<b>Method description</b>	
<p>Research:</p> <ul style="list-style-type: none"> <li>- Literature research on natural ventilation and specific applications</li> </ul> <p>Design:</p> <ul style="list-style-type: none"> <li>- Analysis of the existing building in terms of functional layout, spatial qualities and climate control</li> <li>- Interview with a head of research at the AMC concerning the layout</li> <li>- Interview with the manager of exploitation of the AMC</li> <li>- Literature research on sociological effects of open workspace</li> <li>- Research by design : architecture : develop variations to incorporate the results of interviews, precedents analysis and sociological research</li> <li>- Research by design : climate concept : develop an innovative climate concept based on analysis of building, location and results from thematic research paper.</li> <li>- When architectural and technical concept chosen: development of the chosen design</li> </ul>	

## Literature and general practical preference

Thematic research paper:

Literature concerning natural ventilation, amongst others:

- Chenari, B., Dias Carrilho, J., Gameiro da Silva, M. (2016) Towards sustainable, energy-efficient and healthy ventilation strategies in buildings: A review. *Renewable and Sustainable Energy Reviews*, 59, 1426-1447.  
<https://doi.org/10.1016/j.rser.2016.01.074>
- Kleiven, T. (2003) *Natural Ventilation in Buildings: Architectural concepts, consequences and possibilities*. (Doctoral thesis) Norwegian University of Science and Technology, Trondheim, Norway.
- Moosavi, L., Mahyuddin, N., Ab Ghafar, N., Azzam Ismail, M. (2014) Thermal performance of atria: An overview of natural ventilation effective designs. *Renewable and Sustainable Energy Reviews*, 34, 654–670.  
<http://dx.doi.org/10.1016/j.rser.2014.02.035>
- Roaf, S., Nicol, F. (2020) Acceptabele temperature in natuurlijk geventileerde gebouwen. *TVVLmagazine – Onderzoek & Cases*, 05, 62-70

Design:

- Use of atria in naturally ventilated/passive buildings: precedents
- Use of double-skin facades in naturally ventilated/passive buildings: precedents
- "Concurrent" facility: O|2 Lab building by EGM Architecten
- Bernstein, E., Turban, S. (2018) The impact of the 'open' workspace on human collaboration. *Phil. Trans. R. Soc. B* 373: 20170239.  
<http://dx.doi.org/10.1098/rstb.2017.0239>

## Reflection

1. Within the track architecture, I aim to design a building renovation as sustainable as possible yet with great architectonic qualities. The technical and architectonic aspects joined fit within the vision of the Architectural Engineering studio. The renovation-aspects reflects the "Second Life" topic chosen within the studio.
2. With my graduation project, I hope to show that passive solutions are a viable option to make existing buildings, even the biggest and most brutalist ones, more sustainable and future proof. Since it is my ambition to focus on the passive sustainable renovation of the existing building stock, I hope with this project to open door to positions that will allow me to develop similar concepts in my later work.