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), 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	Shenaya Rocha-Dalger
Student number	4777735

Studio		
Name / Theme	Advanced Housing Design, Ecologies of Inclusion	
Main mentor	O. Klijn	Architecture
Second mentor	R. Kuijlenburg	Building Technology
Argumentation of choice of the studio	Residing somewhere, having one's own space or house, is fundamental to a person's identity. Originating from Suriname, where private homeownership is prevalent, my dwelling there spans 180 m2 on a plot of 428 m2 – which is normal in that setting. Having been raised in an environment devoid of housing shortages, unlike the situation in the Netherlands, it deeply concerns me that numerous individuals are in search of living spaces and settle for suboptimal conditions. This motivates me to design high-quality independent dwelling units, incorporating private outdoor spaces.	

Graduation project	
Title of the graduation project	From Blueprint to Greenprint Transforming architecture for a sustainable future
Goal	
Location:	Midden Delfland, The Netherlands
The posed problem,	Since the industrial revolution, man's influence on the climate has rapidly increased. The main reason for this is the emission of greenhouse gasses such as carbon dioxide and methane. In particular, carbon dioxide emissions originating from the built environment play a significant role in shaping climate change. Specifically, the built environment contributes to 38% of total CO2 emissions in the Netherlands. The construction industry faces a significant sustainability challenge, including the responsible use of materials and the imperative to reduce CO2 emissions. As a result of climate change, heat is retained and the earth's temperature rises with major consequences for humans, nature and the environment. Over the past 130 years the average temperature in the Netherlands has increased by 1.7 degrees.

	In addition, human activities significantly impact climate change. An important way to limit climate change is to reduce the ecological footprint of inhabitants as much as possible. With an average ecological footprint of 5.7 hectares per Dutch citizen, biocapacity is exceeded, and the ecological deficit can lead to natural capital depletion and the loss of biodiversity. The prevailing societal structure is predominantly organized for convenience and ease of replacement over ecologically beneficial practices. This consumerist mindset tends to encourage and sustain environmentally harmful behaviors, ultimately contributing to a larger ecological footprint. Hence, there is an urgent need for change.
research questions and	To address these challenges and meet the urgent need for change towards a sustainable future, a fresh perspective is required on how the construction industry can transform towards greater sustainability. In order to grasp the intricate nature of diverse sustainability principles in architectural contexts, the following question is raised: *'Does the creation of a building as an ecosystem, encompassing materials and living entities, significantly impact behavioral patterns of its inhabitants with respect to sustainability?'.* The sub questions derived from this are: *- 'What obstacles emerge during the architectural design process when accounting for the multifaceted aspects of sustainability?'* *- 'In what manner does the architectural representation of a building as an ecosystem proficiently communicate this concept to its inhabitants?'*.
design assignment in which these result.	Designing for victims of domestic violence entails addressing challenges related to safety and security, privacy, affordable housing, and emotional well-being. This emphasis stems from the alarming statistic that 1.2 million Dutch individuals from sixteen-year-old experience domestic violence annually. The proposed design involves creating quality housing and care for the target group, with the environment - public spaces and collective spaces - also contributing to the recovery of the women and their children. The goal is to design a healthy and sustainable living environment for women and children who are victims of domestic violence and identify how the characteristics of healing architecture can help them during their recovery process.

Process

Method description

The urgent need for innovative design strategies that holistically integrate environmental, social, cultural, and economic elements in sustainable architecture, requires various interconnected methods. The methodology will be conducted through Case Study Analysis and Speculative Storytelling.

1. Case Study analysis
   Three architectural projects in the Netherlands will be selected to identify obstacles and challenges, knowledge deficiencies, and successful approaches in architecture and sustainability.
   a. Literature Review
      In this part of the analysis, the research will delve into existing literature and analyze the selected case studies. These findings will form the foundation for further investigation.
   b. Quantitative Analysis – measurements
      To get insight on the effect of the projects on the environment, numerical data will illustrate the impact of buildings' carbon footprint on the environment. Additionally, numerical data will depict how the carbon footprint of the case studies affects the environment. The measurements will be conducted utilizing the CO2 calculation tool provided by Klimaatplein in the Netherlands: https://klimaatplein.nl/handige-tools/gratis-co2-calculator/. Furthermore, data regarding the sustainability of the case studies will be gathered, including details on resource utilization and the quantity of energy consumed.
   c. Qualitative Analysis – Inhabitants behaviors
      In order to bridge the gap between theoretical and practical environmental performances, experiential aspects of sustainable architecture will be captured through surveys and interviews administered by inhabitants of sustainable buildings. This human-centric perspective will gather insights into inhabitants' behavior, perspectives, and comfort levels, aiming to ascertain if sustainable architectural practices encourage sustainable behavioral patterns.

2. Speculative Storytelling
   Through the case study analysis, a narrative will intertwine, featuring The Earth as the protagonist. This story aims to underscore the influence of the current built environment and its inhabitants on The Earth. Given that it matters what stories tell stories, The Earth's narrative will establish a framework for my design proposal. The validity of the innovative design techniques in my proposed design, as well as their role in promoting sustainable practices within buildings and among their inhabitants, will be presented from the perspective of the target group. These speculative stories will employ a variety of mediums, including case studies, sketches and illustrations.

Literature and general practical references

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18. William E. Rees (2009) The ecological crisis and self-delusion: implications for the building sector, Building Research & Information.

Reflection

My research is timely and relevant within today's scientific challenges and offers valuable insights in addressing these challenges. The outcomes derived from the research will establish the foundation for my design proposal within the 'Advanced Housing Design' studio, specifically focusing on victims of domestic violence. By constructing scenarios through storytelling, I give those who are often muted by society a voice and I aspire to inspire architects to proactively engage in shaping a sustainable future co-developed through thinking, writing, and researching.