

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	Richard Múdry	
Student number		

Studio		
Name / Theme	Urban Architecture – Low Town Downtown	
Main mentor	Sam Stalker	Design Tutor
Second mentor	Eireen Schreurs	Research Tutor
Argumentation of choice of the studio	The studio's focus on complex urban contexts and site-specific design - ranging from master planning to architectural detailing - aligns with my architectural interests. I especially appreciate the encouragement to pursue individual fascinations in architecture within the framework of the studio.	

Graduation project	
Title of the graduation project	Gradients of comfort - Redefining Comfort in Learning Environments.

Goal	
Location:	Blikfabriek – Former can factory, Hoboken, Antwerp, Belgium.
The posed problem,	"Comfort [...] is in short supply. Not because the world is running out of it but because, in the face of the climate crisis, we have to collectively adjust to its going away" (Barber, 2019, p. 44). Over the last century, the Western world has become accustomed to high standards of comfort enabled by the built environment. Within thermal comfort, fossil-fueled HVAC systems are expected to mitigate heat in warmer seasons and provide warmth in winter. However, these concepts are constructs of modern societies, coming at a significant energy cost - cooling and heating account for approximately 20% and 50% of building energy use, respectively (Wang et al., 2023). In light of climate change, my research aligns with Professor Barber's assertion that the status quo regarding comfort must be reevaluated. Architects, as "on the front lines," are responsible for "exploring life after" and for

	developing non-carbon solutions for “a world at the edge of discomfort” (Barber, 2019, p. 50). The standardization of comfort through mechanical systems overlooks architecture's potential for rich sensory experiences. Contemporary practice Studio Muoto (2023) critiques the creation of "thick thermoses" that prioritize uniformity over engagement, sacrificing both sustainability and human experience. This prevailing notion of comfort obscures the potential found in discomfort, as varying environmental conditions can improve resilience and create delight through experiences diverse microclimates (Heschong, 1979). Research indicates that asymmetrical thermal environments may enhance pleasure more than uniform conditions. De Dear's (2011) findings suggest that exposure to varied thermal sensations contributes to greater comfort, supporting the design of spaces that intentionally incorporate dynamic conditions. The European Union's emergency plan to limit heating in public and commercial buildings to 19 degrees Celsius represents a direct challenge to established comfort standards, driven by the urgent need to reduce energy consumption and decarbonize the built environment. For architecture, this shift extends beyond mere technological solutions, demanding a re-examination of how we design and inhabit spaces during the climate crisis. This invites us to investigate both the cultural expectations around comfort and the social practices that shape our environmental preferences, opening new questions about the future of comfort in architectural design in a changing climate.
research questions and	What architectural strategies and design interventions can effectively create localized comfort zones and microclimates within buildings? How do social interactions influence individual perceptions of comfort and discomfort. How does physical activity within buildings influence occupants' comfort thresholds and their perception of environmental conditions? What are the physiological and psychological limits of sustainable discomfort in architectural spaces?

	How can the intentional design of contrasting comfort conditions improve spatial experience and user wellbeing? How can a new understanding of human adaptability to varying comfort conditions reduce building energy consumption?
design assignment in which these result.	This project investigates the interplay between comfort, seasonal climate adaptation, and programmatic requirements through the transformation of a former can factory (Blikfabriek) and its surroundings into a mixed-use public hub. The design addresses two interconnected challenges. The first challenge involves developing a secondary education facility that integrates new construction with existing structures. This component emphasizes passive climate control strategies while exploring comfort gradients through transitional spaces and diverse microclimates. The design draws inspiration from the Open Air School movement of the early 20th century, which emerged as a response to widespread respiratory diseases among children. While primarily focused on health benefits, these schools inadvertently challenged conventional notions of comfort in educational architecture - with students attending classes and even napping outdoors in temperate climates like the Netherlands. Moving beyond this binary inside/outside approach of the historical movement, this project offers a contemporary reinterpretation that adopts a more nuanced approach by incorporating a broader spectrum of microclimates and addressing modern considerations such as sustainability, seasonal variations, and enhanced sensory experiences. The second challenge focuses on transforming the current cultural organization Blikfabriek, which resides in several of the former factory halls, from its temporary status into a permanent institution while maintaining its democratic "always open" character. This transformation necessitates reimagining both the building's envelope and its interior to accommodate varying degrees of environmental control. At the urban scale, the design seeks to redefine the site's relationship with Lageweg street, introducing urban characteristics while preserving the industrial architectural memory of the place.

	Both components of the project aim to demonstrate how architecture can reduce energy dependency while enhancing user wellbeing. The design employs intentional variations in comfort conditions and responds to seasonal changes through adaptive strategies, creating a dynamic and environmentally responsive architectural solution.
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Process

Method description

The Urban Architecture graduation studio centers on a district in Hoboken, Antwerp, where the remnants of a once-thriving industrial era now pose open questions about the area's future development. At the heart of this district lies the Blikfabriek - a former can factory transformed into a dynamic hub for small businesses, artisans, artists, and community events. During the initial site visit, the distinctive spatial qualities of Blikfabriek sparked my interest in the relationship between architectural space and perceived comfort. Here, conventional distinctions between interior and exterior blur, creating a network of microclimates that shift with the activities taking place within these adapted industrial structures.

The unique character of Blikfabriek and its surroundings, where traditional climate control systems are largely absent, provides an ideal setting for my research. My investigation will employ a mixed-methods approach:

- Ethnographic research through on-site semi-structured interviews with occupants of Blikfabriek, supplemented by sketches, videos, photographs, and field notes.
- Creating a personal journal to map and narrate my observations of aspects of comfort and discomfort within Blikfabriek.
- Record temperature variations in various spaces throughout Blikfabriek.

Literature and general practical references

Barber, D. A. (2023). *Modern Architecture and Climate: Design Before Air Conditioning*. Princeton University Press.

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Dogma. (2022). *Living and working*. MIT Press.

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Heschong, L. (1979). Thermal delight in architecture. MIT.

Human comfort in buildings. (2022, October 7). Designing Buildings. Retrieved November 3, 2024, from https://www.designingbuildings.co.uk/wiki/Human_comfort_in_buildings

Lecture series: Martino Tattara, Dogma. (2023, February 3). [Video]. YouTube. Retrieved October 30, 2024, from <https://youtu.be/acWkWzifrME>

Pallasmaa, J. (1994). An Architecture of the Seven Senses. In Questions of Perception: Phenomenology of Architecture(July 1994 ed., pp. 27–37).

Pezeu-Massabuau, J. (2012). A philosophy of discomfort. Reaktion Books.

Reckwitz, A. (2020). Society of Singularities. Polity.

Studio Muoto. (2023, November). How to skin a rabbit. E-flux architecture. <https://www.e-flux.com/architecture/after-comfort/567956/how-to-skin-a-rabbit/>

Wang, F., Yang, B., Deng, Q., & Luo, M. (Eds.). (2023). Personal Comfort Systems for improving indoor thermal comfort and air quality. Springer Verlag, Singapore.

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

The project *Gradients of Comfort* aligns with the Urban Architecture studio's focus on the "halfway city" of Hoboken, with my investigation centered on the Blikfabriek as a key part of its transformation into a new local urban center. By studying comfort and discomfort in the built environment, the project engages with the studio's goal of sustainable urban development. Exploring how varying comfort conditions can be applied to new and existing buildings, it contributes to the studio's aim of analyzing and transforming urban contexts. This approach reflects the studio's focus on medium-sized urban sites and its mission to develop innovative solutions for complex urban challenges.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

The project's investigation of comfort in the context of climate change addresses societal challenges while contributing to professional and scientific discourse. It explores how architectural interventions can support the transformation of industrial areas into vibrant urban districts while challenging increasingly rigid regulations concerning comfort. The project's focus on the temporal evolution of Blikfabriek - from temporary to permanent use - engages directly with Lageweg's broader transformation and questions of lasting urban vitality. This work is particularly

relevant as cities worldwide grapple with similar challenges of post-industrial transformation and climate adaptation.