Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

Graduation Plan: All tracks

Personal information	
Name	Meng Chen
Student number	5573238

Studio		
Name / Theme	Complex projects / Bodies & Buildings Berlin	
Main mentor	Hrvoje Smidihen Jelmer van Zalingen	Architecture Architecture
Second mentor	TBD	Building Technology
Argumentation of choice of the studio	Choosing the Complex Projects studio aligns perfectly with my academic trajectory and aspirations. Having specialized in Architectural Engineering and Form Studies in Msc1 and Msc2, I have developed a firm grasp of structure, detail, and model-making. The Complex Projects studio, with its focus on larger scale designs, provides an opportunity to integrate and apply this knowledge in a broader urban context. Furthermore, the studio's location in Berlin resonates with my interest in this city's vibrant architectural culture and urban dynamics. Thus, this choice aligns with both my academic foundation and personal interests.	

Graduation project	
Title of the graduation project	People over Cargo: cargo terminal design in Berlin Tegel Airport
Goal	
Location:	Reinickendorf, Berlin, Germany
The posed problem,	Increasing exposure to physically and mentally demanding working conditions presents a significant problem. Nearly half of all employees encounter physically demanding conditions, with pressures from the growing global trade market amplifying these challenges (Havet et al., 2020). In addition, rapid advancements in digitalization, automation, and robotics have escalated mental stress, increasing mental fatigue and reducing job satisfaction (Meyer & Hünefeld, 2018). Despite architects' focus on people-centered design, there is insufficient

	attention on enhancing strenuous work environments, resulting in poor lighting, ventilation, and insufficient rest areas, affecting workers' well-being and productivity. It is imperative to explore how architectural design can alleviate these conditions, improving the overall work environment, and boosting productivity. This demands innovative design strategies considering ergonomics, acoustics, lighting, indoor air quality, and spatial layout. Interdisciplinary collaboration among architects, health professionals, and industry stakeholders could lead to comprehensive solutions to these complex issues.
research questions and	This study explores the research question: "How can architecture design offset demanding working conditions, both functionally and mentally?", which will be investigated through a cargo terminal design. The research is structured around three main sub-questions: 1. What are the key factors contributing to demanding working conditions? 2. How can architectural design elements and features contribute to demanding environments? 3. How can technology be integrated into architecture design to improve crew working conditions? By identifying the factors that lead to challenging work conditions and examining architectural strategies to address both functional and mental well-being aspects, this study aims to uncover innovative design solutions that alleviate the unique challenges faced by employees in cargo terminal settings.
design assignment in which these result.	The design assignment will involve creating an architectural blueprint for a

	cargo terminal at the repurposed Tegel Airport site that supports workers under demanding conditions. Embracing technological advancements, the design will integrate digitalization, automation, and robotics into the workspace to alleviate physical and mental strain. The plan will focus on innovative design strategies that prioritize ergonomics, acoustics, lighting, indoor air quality, and spatial layout, while ensuring harmonious integration with Tegel's future development plans. Ultimately, the objective of this design is to not only elevate the work environment for employees but also create a positive impact on visitors and the surrounding community, fostering a harmonious coexistence and mutual benefit for all.

Process

Method description

The methodology of this design assignment will be divided into three fundamental areas: program, client, and site.

For the 'program' aspect, an integrated approach combining literature reviews, case studies, benchmarking, and 3D massing will be employed. This approach will guide the estimation of the cargo building's capacity, thereby informing the Gross Floor Area (GFA). It will also aid in identifying zoning, relation schemes, and key spaces, allowing the development of a tailor-made program.

In the 'client' section, literature reviews will be conducted to scrutinize factors such as cargo terminal ownership structures, current trends in the air cargo industry, and future growth forecasts. This analysis will ensure the identification of the most suitable clients for the terminal.

Lastly, 'site' selection will combine quantitative data collection, mapping, site visits, and online research. This procedure will not only evaluate the site in the airport's broader context and its global positioning but also assess its potential impact on surrounding urban areas. Additionally, the site selection process will take into consideration the terminal design requirements and the demanding working conditions inherent in the cargo industry.

Literature and general practical preference

Dul, J., Bruder, R., Buckle, P., Carayon, P., Falzon, P., Marras, W. S., Wilson, J. R., & van der Doelen, B. (2012). A strategy for human factors/ergonomics: Developing the discipline and profession. Ergonomics, 55(4), 377–395.

Havet, N., Fournier, J., Stefanelli, J., Plantier, M., & Penot, A. (2020). Disparate exposure to physically demanding working conditions in France. Revue d' Épidémiologie et de Santé Publique, 68(6), 327–336. https://doi.org/10.1016/j.respe.2020.09.008

Havet, N., & Penot, A. (2022). Trends in exposures to physically demanding working conditions in France in 2003, 2010 and 2017. European Journal of Public Health, 32(1), 73–79. https://doi.org/10.1093/eurpub/ckab195

Kaplan, R., & Kaplan, S. (1989). The experience of nature: A psychological perspective. Cambridge university press.

Maynard, M., Clawson, D., Cocanougher, M., Walter, D., Brimble, R., Webber, M., Janisse, R., Freidheim, K., Miller, R., Airport Cooperative Research Program, Transportation Research Board, & National Academies of Sciences, Engineering, and Medicine. (2015). Air Cargo Facility Planning and Development" Final Report (p. 22094). Transportation Research Board. https://doi.org/10.17226/22094

Meyer, S.-C., & Hünefeld, L. (2018). Challenging Cognitive Demands at Work, Related Working Conditions, and Employee Well-Being. International Journal of Environmental Research and Public Health, 15(12), 2911. https://doi.org/10.3390/ijerph15122911

Salas, E., Wilson, K. A., Burke, C. S., & Wightman, D. C. (2006). Does crew resource management training work? An update, an extension, and some critical needs. Human Factors, 48(2), 392–412.

Schäfer, J. G. (2023). Air Cargo: Participants - Processes - Markets - Developments. Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-38193-6

Schulte, P. A., Pandalai, S., Wulsin, V., & Chun, H. (2012). Interaction of occupational and personal risk factors in workforce health and safety. American Journal of Public Health, 102(3), 434–448.

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)?

My project of designing a cargo terminal aligns with the Complex Projects studio

theme 'Body, Building, Berlin.' It addresses workers' physical and mental conditions (Body), employs architectural principles for building a functional and beneficial structure (Building), and integrates into Berlin's urban fabric and future plans (Berlin). This connection is further enhanced by my master track (Architecture) within master program (MSc AUBS), allowing a comprehensive, people-centric, and contextually aware design approach, vital for addressing demanding working conditions in today's global trade environment.

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

The graduation project addresses critical social, professional, and scientific domains. Socially, it aims to improve worker well-being and productivity in demanding settings, challenging health disparities. Professionally, it promotes a human-centric design ethos in architecture, leveraging technology and sustainability. Scientifically, it expands knowledge on the impact of built environments on human health, integrating interdisciplinary research, and evidence-based design. This work paves the way for future exploration in architecture and occupational health studies.