

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	Alida Judith Oosterhoff	
Student number	4848152	
Studio		
Name / Theme	Heritage & Architecture – Modern Malls	
Main mentor	Lidy Meijers	Design
Second mentor	Paddy Tomesen	Building Technology
Third mentor	Federica Marulo	Research
Argumentation of choice of the studio	<p>The combination of old and new and how to reuse existing materials or constructions is something I've always found interesting. A lot of experimenting and practising architecture has happened, and instead of creating new things, I think it is interesting to take the things that already work and improve or use it and apply it to something different. Or change practises that didn't work for certain buildings and places, but might be useful somewhere else. Looking at already existing buildings and urban patterns, this can be used to learn from. How things are build, how it fits (or not) in the surrounding and why.</p> <p>Every building is different and people put value to it for different reasons. People have different stories to places and buildings, since events happen everywhere. For me it is important to let people keep these memories. I'm someone who connects memories to places/spaces/buildings/rooms or materials in general, so for me it's important to preserve these memories (if necessary). But it's also important not to get stuck in the past, so by preserving it and/or changing it to presents needs, it can be something from the past, the present and the future.</p> <p>When it comes to the topic malls, it is an interesting space. Malls are places where (almost) everybody goes to. Most area's have at least one (neighbourhood) mall. Those are places where people come together, not necessarily to meet up, but it's a centre point. Besides</p>	

	that it is a part of people's lives. They (might) come there weekly for their basic needs like food or clothes. The shopping culture has changed quite a lot the last century and will still undergo a lot of changes in the future.
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Graduation project	
Title of the graduation project	A hidden oasis within the city centre of Apeldoorn
Goal	
Location:	City centre Apeldoorn
The posed problem, research questions and design assignment in which these result.	
<p>People spend about 85 to 90% of their time indoors and then predominantly at home by 70% (Health-based guideline values for the indoor environment, 2008). People who work full-time in an office are inside an office space about 20% of the time (Norbäck, 2009). That means it is important that the conditions in the building are of good quality and do not cause health issues. In an indoor mall, it should be no different. The time spent in an indoor mall is in addition to the hours spent indoors. Getting a headache in the indoor mall after a day of shopping might sound familiar to some and according to the Sick Building theory, several people suffer from it and other health issues that come with it. Occupants can experience a variety of complaints when spending time within the building, including (mild) upper respiratory symptoms (eye, nose and throat issues), headache, fatigue, rash and sensitivity to smell. A building suffers from sick building syndrome when 20% of the occupants experience these health and comfort effects (Passarelli, 2009).</p> <p>On the basis of this problem definition, the following main question was drawn up, followed by three sub questions: How to improve the experience of a human wellbeing in a shopping mall by architectural interventions?</p> <ol style="list-style-type: none"> 1) What elements affect the human wellbeing the most by literature? 2) How do visitors of the shopping mall experience the physical elements of the mall? 3) What element(s) has the most impact on the experience of the mall? <p>The research aims to create a better understanding of what physical elements are present in the shopping mall and how they can be used to create a space beneficial for the human wellbeing. Therefore for understanding this, the results of the research will be translated into an overview of physical elements present in a shopping mall with an explanation of the effect of these elements on human health.</p> <p>Before interfering with the building, the values and qualities of the design case will be identified. The values people give to the physical elements present in the mall are compared with the research done on the desired physical elements and their</p>	

implementation. This gives an insight into the current situation and what needs to be changed about the building to create a pleasant space.

The results of the research will then be translated into interventions for a redesign of a shopping mall. One post-war shopping mall in the Netherlands will be chosen as the design case, which will then be used for the interventions to improve the building. This design case will be de Oranjerie in Apeldoorn, due to the covered space, the location in the city centre and the function as a recreational shopping mall where people could spend over an hour.

The research of Evidence Based Design and the principles of Indoor Environmental Quality will be combined together with the causes of Sick Building and applied to an already existing building. The IEQ gives information about the elements available and how they affect human wellbeing. With a combination of EBD, they can create solutions for the mall to improve human wellbeing through the spatial experience.

Process

Method description

To be able to answer the main question and the sub questions several methods will be used. First of all, literature will be used, to provide academic information on the topic of research that has already been done. Secondly, observations and questionnaires are conducted using two case studies.

Question 1: What elements affect the human wellbeing the most by literature?

Literature on existing theories will be used on the effect of physical elements on the occupants of the building. Medical literature about the way spaces influence the patients are used, as well as studies that have been done on occupants and the effects of the elements. These theories are Sick Building Syndrome, Indoor Environmental Quality and Evidence Based Design.

Question 2: How do visitors of the shopping mall experience the physical elements of the mall?

The research for the first sub-question resulted in several physical elements having an effect on the well-being of visitors to the mall. These physical elements were then incorporated into questions asked of visitors to two different malls that serve as case studies. The case studies chosen were the Oranjerie (also the design case) and Westfield Mall of the Netherlands. Correspondingly, they are both recently renovated, indoor shopping malls where there are mainly clothes shops. But there are also differences, Westfield mall is better known (in my circles) than the Oranjerie and there are fewer rest areas and eating places present in the Oranjerie. The answers were then put into tables and graphs to look at mall satisfaction.

Question 3: What element(s) has the most impact on the experience of the mall?

Of the responses from the interviews in the two case studies, the answers were processed and by comparing them, it is interesting to see what people value most. Together with the literary study of the first sub-questions, the most impactful elements emerge here. In this study, these are material and green. Also pictures were taken of the possible elements when visiting the mall and compared with each other. This way the positive elements can be used to improve the negatives.

Literature and general practical preference

Multiple theories are used in this research. To explain the effect of the building on the occupants wellbeing, three theories were used. These are Sick Building Syndrome, Indoor Environmental Quality and Evidence Based Design.

Sick Building Syndrome (SBS):

Kubba, S. (2016). Indoor Environmental Quality (IEQ). Elsevier eBooks, 303–378. <https://doi.org/10.1016/b978-0-12-803830-7.00007-4>

Norbäck, D. (2009). An update on sick building syndrome. *Current Opinion in Allergy and Clinical Immunology*, 9(1), 55–59. <https://doi.org/10.1097/aci.0b013e32831f8f08>

Passarelli, G. Sick building syndrome: An overview to raise awareness. *J Build Apprais* 5, 55–66 (2009). <https://doi.org/10.1057/jba.2009.20>

Redlich, C. A., Sparer, J., & Cullen, M. R. (1997). Sick-building syndrome. *The Lancet*, 349(9057), 1013– 1016. [https://doi.org/10.1016/s0140-6736\(96\)07220-0](https://doi.org/10.1016/s0140-6736(96)07220-0)

Rostron, J. (2008). Sick building syndrome: A review of causes, consequences and remedies. *Journal of Retail & Leisure Property*, 7(4), 291–303. <https://doi.org/10.1057/rlp.2008.20>

United States Environmental Protection Agency. (1991). Indoor Air Facts No. 4 Sick Building Syndrome (revised). Retrieved 12 April 2023, from https://www.epa.gov/sites/default/files/2014-08/documents/sick_building_factsheet.pdf

Indoor Environmental Quality (IEQ):

Abdulaali, Hayder & Usman, Ismar & Hanafiah, Marlia & Abdulhasan, Mahmood & Talib, Mushtaq & Nazal, Amani. (2020). Impact of poor Indoor Environmental Quality (IEQ) to Inhabitants Health, Wellbeing and Satisfaction. xx-xx.

Frontczak, M. J., & Wargocki, P. (2011). Literature survey on how different factors influence human comfort in indoor environments. *Building and Environment*, 46(4), 922–937. <https://doi.org/10.1016/j.buildenv.2010.10.021>

Kubba, S. (2016). Indoor Environmental Quality (IEQ). Elsevier eBooks, 303–378. <https://doi.org/10.1016/b978-0-12-803830-7.00007-4>

Wong, S. K., Lai, L. W., Ho, D. W. C., Chau, K. W., Lam, C. L. K., & Ng, C. F. S. (2009). Sick building syndrome and perceived indoor environmental quality: A survey of apartment buildings in Hong Kong. *Habitat international*, 33(4), 463–471. <https://doi.org/10.1016/j.habitatint.2009.03.001>

Evidence Based Design (EBD):

Alfonsi, E., Capolongo, S., & Buffoli, M. (2014). Evidence Based Design and healthcare: an unconventional approach to hospital design. *Annali di igiene : medicina preventiva e di comunità*, 26(2), 137–143. <https://doi.org/10.7416/ai.2014.1968>

Gelder, M. H. (2016). Evidence-based design in Nederlandse ziekenhuizen: ruimtelijke kwaliteiten die van invloed zijn op het welbevinden en de gezondheid van patiënten. <https://wiegerinck.nl/en/research/healing-environment-evidence-based-design/>

Nickl-Weller, C., & Nickl, H. (2013). *Healing Architecture* (1ste editie). Braun Publishing AG.

Ulrich, R.S. (2003). *Evidence Based Environmental Design for Improving Medical Outcomes*.

Wagenaar, C. (2006). *The Architecture of Hospitals*. NAI Publishers.

Two case studies were used to gather more information about the way people experience the building of the mall. These are the Oranjerie in Apeldoorn and Westfield Mall of the Netherlands in Leidschendam. Both of the malls were visited and people inside were interviewed by me and asked about the way they experience the physical elements of the mall. Also pictures were taken of the mall and later on analysed and compared with each other.

Other:

Health-based guideline values for the indoor environment. (2008). RIVM. Retrieved 10 April 2023, from https://www.rivm.nl/publicaties/health-based-guideline-values-for-indoor-environment#abstract_en

Boubekri, M., Cheung, I. N., Reid, K. J., Wang, C., & Zee, P. C. (2014). Impact of Windows and Daylight Exposure on Overall Health and Sleep Quality of Office Workers: A Case-Control Pilot Study. *Journal of Clinical Sleep Medicine*, 10(06), 603–611. <https://doi.org/10.5664/jcsm.3780>

Korsavi, S. S., Montazami, A., & Mumovic, D. (2020). The impact of indoor environment quality (IEQ) on school children's overall comfort in the UK; a regression approach. *Building and Environment*, 185, 107309. <https://doi.org/10.1016/j.buildenv.2020.107309>

Section 3: Concepts of health and wellbeing | Health Knowledge. (2017). Health Knowledge. Retrieved 10 April 2023, from <https://www.healthknowledge.org.uk/public-health-textbook/medical-sociology-policy-economics/4a-concepts-health-illness/section2/activity3#:~:t%E2%80%A6>

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 research focuses more on what can counteract symptoms of SBS and how the environment of a post-war shopping mall can be improved. The research falls under the Heritage and Architecture studio. In the studio, conducting research will explore how the mall became to its current state, determining the values present, investigating interventions and what the mall looks like in the future. The role of a shopping mall is changing due to the advent of online shopping. So during the studio, the importance of the mall will be investigated, including the creation of a comfortable space within it (Heritage & Architecture, n.d.).

With the information of the theories and the effect of the elements, the mall that will be re-designed (Oranjerie), will be investigated on these elements. This will give information about how people feel about it in the current state. The worth of the building can be "decided" from the information and based on that decisions can be made to estimate the values of the separate elements and also the whole building. When designing, these elements will be the main focus and incorporated with the new design.

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

Spaces influence the health of a person. So walking around in a shopping mall can affect the wellbeing of a person. Studies have shown that these effects can result in health related issues (Kubba, 2016). Even though most people don't spend their time in a mall every day, still it does affect your health and the rest of your day.

There are several articles published about the importance of IEQ and EBD, but most are researched on primary schools, homes, universities, offices and others (Kubba, 2016; Wong et al., 2009; Korsavi et al., 2020; Boubekri et al., 2014). Evidence based design is even developed for the improvement of hospitals and not for different types of buildings (Wagenaar, 2006). When doing this research, more information will be found for the specific case of a shopping mall. While people spend quite some time at home and work, they might spend less time in the shopping mall (Health-based guideline values for the indoor environment, 2008; Norbäck, 2009). The information collected will provide more insight into the experience of physical elements in a shopping mall.

While searching for information on applying EBD when using heritage interventions, few results emerged. The research could provide more information on this.