

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	Joost van Iersel	
Student number	4594932	

Studio		
Name / Theme	Revitalizing heritage, Zero waste church	
Main mentor	Catherine Visser	Architecture (Heritage & design)
Second mentor	Mo Smit	Building technology
Third mentor	Wido Quist,	Research (Heritage & technology)
Fourth examiner	Viktor Munoz Sanz	External examiner
Argumentation of choice of the studio	<p>In the last years, a personal fascination with the transformation of buildings was formed. With the lack of space in the cities, the current environmental problems, and the opportunities that old buildings bring, the transformation of buildings feels like a necessary tool to overcome future challenges.</p> <p>In addition, last year, I took a gap year to work in a student board that transformed old offices into student houses. I learned a lot about the opportunities and difficulties of this discipline. From that moment on, I knew I wanted to specialize in this challenging discipline.</p> <p>Finally, looking at the graduation studios of transformation, the zero-waste church stood out. Including the heritage factors of these buildings with their history, seems to me like an interesting addition to the analysis of my graduation thesis.</p> <p>Therefore, I chose this studio because of its actuality of the present problems and my personal ambition in these topics.</p>	

Graduation project	
Title of the graduation project	The Synergy of heritage and sustainability
Goal	
Location:	De Kruispuntkerk, Voorschoten
The posed problem,	<p>The Kruispuntkerk is a case of a vacant church, that is struggling to find a new function for almost a decade. With the church board already thinking to repurpose since 2013, due to the lack of visitors, already ten transformation plans were made. However, the conclusion is that the transformation of this church has been a bottleneck ever since. All past plans were declined because the citizens and municipality felt like the new design strategies did not rightfully preserve the values of this town-defining building, with all its history. This is specific to the case study, but it is part of a bigger general problem all over the Netherlands:</p> <p>The decision-making process of choosing the right conservation strategies for listed churches is too difficult and time-consuming, for the urgent building and environmental crisis that the Netherlands is currently in.</p>
research questions and	<p><i>"Can sustainable conservation strategies be synergized to optimize the decision-making process of listed buildings?"</i></p> <ol style="list-style-type: none"> 1. What is the relationship between sustainability and heritage? 2. How do different assessment tools of sustainability and heritage values work? 3. What do assessment tools have to offer during the design process? 4. What are the relationships between the conservation strategies?
design assignment in which these result.	The final design of the Kruispuntkerk uses an optimized set of conservation

	<p>strategies, provided, and assessed by supporting tools. Accordingly, synergizing the conservation strategies, to enhance sustainability, while preserving the heritage values of the church.</p> <p>To create this final design, all sub-questions must be answered. Some sub-questions will provide answers useful as the backbone for the design research, while others sub-questions will be answered by reflecting on the design research of the case study. Reflecting on how the design process, a conclusion can be written about what combination of strategies works best for the Kruispuntkerk, as well as other churches in the future.</p>
--	---

Process

Method description

SQ1: This is done by literature research on the topics of sustainability and heritage and their integration with each other. Defining “sustainable” “conservation” and “strategies” is a big part of this. A comparison has already been done in *beyond good intentions* [4].

This results in the key aspects where to focus on in the comparison of assessment tools, two of them being the combination of heritage and sustainability and the implementation in the Dutch heritage valuation system. In addition, these key aspects can be used as the first directions for the design research, narrowing down on specific topics, an example being the design possibilities to enhance sustainability in churches.

SQ2: This can be answered by literature research on the existing assessment tools that help and support the decision-making process in the sustainable conservation of listed buildings. Comparing existing tools and finding which ones fit my own key aspects from SQ1, the most suitable tools for this thesis can be chosen. Previous research, as *Verduurzamingsmodellen* [3], is used to help in this process of answering this sub-question. The important aspect here is the reflection of tools in general as well. These tools are used to objectify design choices, but is this even possible in heritage?

The results are the assessment tools *DuMo* [1] and *BPSC* [2]. Both specialized in their own way, and both can now be implemented in the design process, providing the first design opportunities and threats of the Kruispuntkerk.

SQ3: One of the important reasons *DuMo* and *BPSC* were chosen, is because of the difference in the phase they are applied in, therefore having different support roles in

the process. BPSC specializes before the design, highlighting the heritage and sustainable values of the existing building, and helping the user to understand the strengths and weaknesses of the building. DuMo on the other hand is used to monitor interventions and strategies in hindsight, reflecting on the impact of the transformation.

Therefore, the tools can provide support in the decision-making process of design strategies of the case study. BPSC highlights conservation opportunities and DuMo monitors the effect of these conservation strategies. By reflecting on the design process through the implementation of these, the usefulness of both these tools can be analyzed.

During the process the results of DuMo and BPSC will be compared to the value assessment of the kruispuntkerk, done in P1 by my own student group. This is to reflect on the objectivity of the results of the tools.

SQ4: In the design process different strategies, provided by SQ3, will be chosen, and tested by implementing them in the case study design. The research of *Verduurzamingsmodellen* [3], has rightfully mentioned that most existing tools lack a relation between strategies. Focusing on these relations specifically provides new answers in this discipline. Here, one of the focuses will be the relation of the strategy of the "Zero waste approach" with other strategies, therefore specializing in the ambitions of the graduation studio as well.

Design process: As read above, the design process is integrated throughout the research, but for clarification, the process of how to get to important design decisions will be written in short.

Through the implementation of tools to the Kruispuntkerk, threats and opportunities will be highlighted, in relation to sustainability and heritage. Some strengths found by the first implementation of BPSC on the Kruispuntkerk are; use of daylight, utilization of the height, open layout, durable structure, building techniques, and connection to local culture & events.

The next step is the translation of these opportunities into practical design strategies. These strategies are provided by DuMo, an example being the implementation of a glass buffer zone, utilizing the daylight aspect. Another is the open layout and connection to local culture & events, providing direction for the program; a multifunctional gathering space for local culture.

After a strategy is chosen and applied, the consequences of the transformation will be analyzed by DuMo, as well as other methods, for example, a light study maquette.

Reflecting on the chosen strategies, a conclusion can be made if the right strategies were chosen and if these strategies are beneficial to each other. Then, the process can start again with the newly gained knowledge.

In the end, the ambition of the design and research process is to create a clear and traceable path to help choose the right conservation strategies, regarding the sustainability and heritage values of the building.

Literature and general practical preference

(The sources are in APA-style on the next page)

For the theoretical framework assessment tools and research about them are used. The main sources are:

[1] *DuMo*: An assessment tool used for its strategies, as well as its assessment of interventions.

[2] *BPSC*: An assessment tool that helps in spotting threats and opportunities of buildings, therefore helping to focus on choosing the right strategies.

[3] *Verduurzamingsmodellen KaDer*: Comparison of most prominent assessment tools used in the Netherlands, used to find the appropriate tool for this thesis.

On the topic of the relationship between sustainability and heritage, important sources are:

[4] *Beyond good intentions, Sustainable Conservation*: Part of the framework why the integration of sustainability and heritage is so important.

[5] *Sustainable construction*: Why the use of assessment tools is important.

[6] *World Heritage and Sustainable Development*: The integration of sustainability and heritage and a worldwide level.

Practical experiences are all the gathered data from the archive and news about the Kruispuntkerk, as well as interviews with the main stakeholders. Results are designs of several transformation plans, a heritage report, and political debates about the Kruispuntkerk.

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)?

With my chosen track of Architecture, Zero waste church, relations can be seen. The studio was chosen because of my fascination with sustainable transformations as well as the challenge in the preservation of heritage. Therefore, my topic, The Synergy of heritage and sustainability, fits perfectly in researching the interaction of these two topics with each other. Having Zero Waste as one of the prominent conservation strategies, this topic significant to the studio will be heavily included as well.

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

By providing extra information and support in the decision-making process of the transformation of churches, finally, the Kruispuntkerk can transcend to the next phase in its transformation process. Reflecting on the design process and the used assessment tools, future projects can learn from the significance of combining the right strategies. Finding what strategies should be chosen and combined, benefits future similar projects.

As seen in literature [6], sustainable development of heritage in the world is a necessity to meet the environmental and social demands of the future. Were there are existing tools already, none seem capable to capture the balance of heritage and sustainability values, specializing in the relation between different conservation strategies.

By analyzing established existing tools and reflecting on their usefulness, as well as the design process of the Kruispuntkerk, better and faster decisions can be made to choose the suitable combination of conservation strategies, beneficial to the preservation of the past, as well as the innovations of the future.

- [1] Nusselder, E. J., van der Ven, H., [et, Schnitger, C., Stichting Bouwresearch (SBR), de Groot, A., Haas, M., Dulski, B., & Tekst/Support (Amsterdam). (2008). Handboek duurzame monumentenzorg / druk 1: theorie en praktijk van duurzaam monumentenbeheer. SBR.
- [2] Dos Santos Gonçalves, J., & Mateus, R. (2022). Building passport for the sustainable conservation of built heritage. *Journal of Cultural Heritage Management and Sustainable Development*, ISSN: 2044-1266.
<https://www.emerald.com/insight/content/doi/10.1108/JCHMSD-10-2021-0177/full/html>
- [3] Quist, W. J., Huizinga, S. C. E., & Zijlstra, H. (2020). Verduurzamingsmodellen KaDEr. TU Delft. <https://research.tudelft.nl/en/publications/verduurzamingsmodellen-kader-deelproject-5>
- [4] Dos Santos Gonçalves, J., & Mateus, R. (2022). Beyond good intentions. *Journal of Cultural Heritage Management and Sustainable Development*, ISSN: 2044-1266.
<https://doi.org/10.7480/abe.2022.21.6875>
- [5] Ding, G. K. (2008). Sustainable construction—The role of environmental assessment tools. *Journal of Environmental Management*, 86(3), 451–464.
<https://doi.org/10.1016/j.jenvman.2006.12.025>
- [6] World Heritage and Sustainable Development. (2013). POLICY FOR THE INTEGRATION OF A SUSTAINABLE DEVELOPMENT PERSPECTIVE INTO THE PROCESSES OF THE WORLD HERITAGE CONVENTION. In Unesco. Unesco. <https://whc.unesco.org/document/139146>