

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	Catherijne Schot
Student number	4874676

Studio		
Name / Theme	Architectural Engineering	
Main mentor	Yannick Warmerdam	Architecture
Second mentor	Jos de Krieger	Research
Argumentation of choice of the studio	<p>The approach in the graduation studio of Architectural Engineering from a technical point of view appealed to me a lot, which is why I chose the studio in the first place. The research, design projects and good stories from alumni pointed out to me that there was a lot of freedom in shaping your graduation project, which made me enthusiastic. I did not have a clear idea of what I wanted to work on yet, but I hoped that by choosing this studio I could find the research and design topics that would be worth spending my graduation year on. The technique behind architecture and its technical solutions, strategies and innovations have always fascinated me. I am always curious about the engineering aspects and the reasoning behind the choice of certain technical solutions and the idea of having plenty of time to explore that in the Architectural Engineering studio just seemed like a perfect fit for me.</p>	

Graduation project	
Title of the graduation project	Reimagine // Sustainable Alpine Architecture & Tourism: Reimagining through Circular Strategies
Goal	
Location:	Region of Ellmau, Austria
The posed problem, research questions and	Challenges in the Alpine Region, Circularity Gap, Climate Change and Tourism
	Research Question: How can circular solutions be effectively integrated into the design process of reimagining Architecture in the Austrian Alps to enhance the Sustainability of Tourism and contribute to closing the Circularity Gap in Austria?
design assignment in which these result.	Design Question: How to design a circular building project in the Austrian Alps that not only contributes to sustainable tourism , but

	also to closing the Circularity Gap in Austria?
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Overall Design Objective

As a starting point, the objective could be phrased as one in which the Alps are seen as a Laboratory for Circular Building Methods, while contributing to closing material loops in these regions is the real accomplishment. With this as a base for the design objective, a bold vision could be created: *"A circular building project in the context of the Austrian Alps, contributing to a more sustainable way of tourism and fulfilling the circularity ambitions."*

The overall objective of this project is to develop and use a design approach that prioritises circularity. By integrating principles like material reuse (if possible) and innovative design strategies, the project aims to make use of a strategy for environmentally conscious architectural interventions adapted to the challenges and opportunities of the alpine context.

Overall design question / design hypothesis

How to design a circular building project in the Austrian Alps that not only contributes to sustainable tourism, but also to closing the Circularity Gap in Austria?

Thematic focus point: How can the design serve as a manifestation of circular innovation?

Programmatic: How can the design restore the qualities of the mountains, emphasise them and let people (inhabitants & tourists) continue to enjoy them?

Thematic Research Objective

Develop/find effective design solutions and/or strategies to help bridge the Circularity Gap of Austria while aligning with sustainability goals for tourism in the Austrian Alps.

The main objective of the thematic research is to investigate the potential of certain circular design strategies for architecture and building practices in the Austrian Alps. Within the thematic research, it is interesting to investigate material reuse as a circular building practice and see what the potentials are in this context. It should be considered whether reusing materials carries the greatest potential to contribute to closing the Circularity Gap in Austria, or whether other circular strategies are more adequate. In addition, it would be useful to find out, how this can be integrated into the design process. The aim is also to gain knowledge about precedents of circular projects and the integration of technology in the design process, in this way having guidelines in making choices concerning materials, building methods and construction. The research should also give insights into the various flows in the tourism sector that are currently taking place in an unsustainable way and where there is the greatest opportunity for improvement. This should provide knowledge and insight into how to contribute to increasing the sustainability of tourism flows, so that informed choices can be made, especially in the programme and the needs of users. These research themes directly align with the general problem statement of the ambitious circular ambitions of Austria and the desired change into sustainable tourism strategies to maintain the economy. By researching how to effectively contribute to these ambitions and how to add value with architectural interventions, the research theme aligns with the overall design objective, aiming to design a circular building project contributing to a more sustainable way of tourism.

Thematic Research Question(s) / Thematic Research Hypothesis

How can circular solutions be effectively integrated into the design process of reimagining Architecture in the Austrian Alps to enhance the Sustainability of Tourism and contribute to closing the Circularity Gap in Austria?

Sub-questions:

Which (combination of) circular solutions contribute to **closing the Circularity Gap in Austria?**

Researching the Circular Economy of Austria and finding out what potentials are there and which suit the design objective best. Should there be a focus on reuse strategies with reclaimed materials or will for example biobased material solutions be more of use?

Which (material) flows should be prioritised to enhance **the Sustainability of Alpine Tourism?** By answering this question, insights can be gained into the flows that are present within Alpine Tourism. Which ones have a significant impact on the sustainability of tourism and how could this sector be even more improved in their sustainable strategies?

How can the **integration of circular solutions be optimized** within the design process? This sub-question relates to the first one and to the 'effectively integrated' part of the thematic research question. When answers to the first sub-question are found, it would be useful to find out how they could be integrated optimally into the design process of the project in this specific context and its challenges. This question is part of the research questions, but is not thoroughly discussed within the paper, this part will be something that will be researched by doing and implementing the strategies in the design.

Process

Method description

The thematic research will employ a combination of qualitative and quantitative methods, including literature review, case study analysis and eventually organising the potential of circular strategies. These methods will provide a comprehensive understanding of the challenges and opportunities related to which circular strategies have exciting potential and how to implement them. The method of research per sub-question and expected answers are described in the research plan. The research plan contains a methodology scheme, in which the desired outcomes to use as design input are also added. As described above, the integration question is something that should be part of the research by design.

Literature and general practical references

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Reflection

Relation between graduation topic, the studio topic, master track, master programme

The graduation project, "Sustainable Alpine Architecture & Tourism: Reimagining through Circular Strategies," aligns with the studio topic of Architectural Engineering, which focuses on leveraging technology to address critical design questions. The studio's emphasis on integrating advanced technological solutions into architectural practices to solve pressing issues is directly reflected in the project's aim to utilise circular building methods and innovative design strategies. By reimagining architecture in the context of the Austrian Alps through circular strategies, the project explores how technological advancements within the Circular Economy can be harnessed to imagine another form of sustainable tourism and close the material loops, addressing both environmental and economic challenges. The master track of Architecture centres on the development of innovative, sustainable, and contextually responsive architectural solutions. In this case these principles are visual in proposing a design approach that not only responds to the unique environmental and cultural context of the Alps, but also addresses broader sustainability goals, like the Circularity Gap. The project emphasises the importance of designing structures that coexist harmoniously with their natural surroundings while utilising circular strategies to minimise environmental impact. This aligns with the commitment of the master programme to create resilient, forward-thinking designs that contribute positively to their contexts. The MSc programme in Architecture, Urbanism, and Building Sciences promotes a multidisciplinary approach to solving complex built environment challenges. The project integrates principles from architecture, technology, regional flows, planning, and circular economy, reflecting a holistic perspective. By addressing the intersection of climate change, sustainable tourism and circular building practices, the research contributes to the broader objectives of the master.

Relevance of graduation work in the larger social, professional and scientific framework

Given Austria's ambitious circular economy goals for 2030 and 2050, there is an urgent need for innovative solutions that accelerate the implementation of circular practices. The project directly contributes to this need by exploring how circular building strategies can be effectively integrated into architectural design processes in the Alpine region. The insights gained from this research have the potential to inform future architectural projects, promoting a shift towards more sustainable building practices. By addressing the critical need for sustainable tourism and resilient architectural solutions in the face of climate change, the project holds significant societal relevance. It aims to preserve the economic resilience of Alpine regions while fostering environmental awareness among inhabitants and tourists. Additionally, the project's focus on circular strategies contributes valuable knowledge to the scientific discourse on climate change mitigation and adaptation, offering practical solutions that can be applied beyond the confines of the Alpine region.

The project deals with the challenges within the Austrian Alps, aiming to protect the region's environmental and cultural heritage. It encourages environmental awareness and responsible behaviour among tourists, ensuring the long-term viability of tourism.

Offering practical strategies for integrating circular economy principles, the work addresses the need for sustainable practices in architecture and construction. This work contributes to the body of

knowledge on circular economy practices in architecture, providing practical insights. It adds valuable data on sustainable architecture in mountainous environments, informing future research and policy-making. By combining principles from architecture, sustainability and circular economy, the project demonstrates the benefits of cross-disciplinary collaboration. It aims to influence industry trends and inspire a shift towards more sustainable, resilient, and adaptable built environments.