

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	Douwe de Jager	
Student number	4751353	
Studio		
Name / Theme	Architectural Engineering	
Main mentor	Mauro Parravicini	Architecture
Second mentor	Gilbert Koskamp	BT
Third mentor	Jos de Krieger	Research
Argumentation of choice of the studio	<p>I chose Architectural engineering, because it's a studio with a lot of freedom in terms of topics and allows me to do something with my interest. The assembly and disassembly of buildings and the relation with sustainability is something that intrigues me and fits within this studio.</p> <p>(Something went wrong with my graduation studio registration. The original studio I was supposed to do was canceled, and once I got informed, there was a limited amount of studio's I could choose from.)</p>	
Graduation project		
Title of the graduation project	<p>Re-Applied Physics</p> <p>Transforming Applied Physics by using R-strategies on reclaimed building components</p>	
Goal		
Location:	<p>Delft, TU Delft Campus</p> <p>Faculty of Applied Physics</p>	
The posed problem,	<p>The construction industry plays a large role in the production of waste. The efficiency of strategies to deal with this waste is not ideal. Furthermore, the transportation of new building materials enlarges the carbon footprint of the construction industry. By balancing the R-strategies such as refuse, reuse, repair, repurpose and recycle, the construction industry creates less waste and lowers its carbon footprint. Building 22 (Applied Physics) on the campus is technically outdated. Moreover, the TU Delft wants to attract more students, which will cause a need for more student housing.</p>	

research questions and	<p>How can reclaimed building components from the interior of building 22 Applied Physics be purposed for the transformation from educational function to public function and student housing?</p> <ol style="list-style-type: none"> 1. What repetitive building components can be reclaimed from the interior of building 22 Applied Physics? 2. What are the requirements for the building when changing it from educational function to public functions and student housing? 3. How can existing interior building components be purposed in order to fit the needed interventions?
design assignment in which these result.	<p>Building 22 on the TU Delft campus will be transformed from educational function, into student housing and public functions, by keeping the structure and using R-strategies to use reclaimed building components of the existing building in the transformed building.</p>
Process	
Method description	
<p>The first part of the research, before the start of the designing phase is mainly covered by the research that is done for the research paper. Literature study is used to explore strategies on how to use reclaimed building components and to find out what kind of purposes there are. An observation on site and plan analysis provides an inventory of building components. Assessment, based on possibilities, regulations and functions is done to create an overview of proposed strategies for the reclaimed building components.</p> <p>The second part of research goes simultaneously with the design. An analysis for functions leads to a design proposal, which will be altered by the research on how the reclaimed building components fit within this design by using case studies.</p>	

Literature and general practical preference

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Architectenweb (2022) *Forbo recyclet 20 jaar oude vloer TU Delft*. Available at: <https://architectenweb.nl/nieuws/artikel.aspx?ID=51793> (Accessed: December 14, 2022).

BREAAM NL (no date) *Akoestiek - BREEAM-NL richtlijn*. Available at: <https://richtlijn.breeam.nl/credit/akoestiek-107> (Accessed: January 14, 2023).

Britannica (2016) *bystander effect - Diffusion of responsibility*. Available at: <https://www.britannica.com/topic/bystander-effect/Diffusion-of-responsibility> (Accessed: December 15, 2022).

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Chang, Y., Chen, H.-L. and Francis, S. (1999) "Market Applications for Recycled Postconsumer Fibers," *Family and Consumer Sciences Research Journal*, 27(3), pp. 320–340. Available at: <https://doi.org/10.1177/1077727x9902700303>.

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Lewitin (2020) *A Look at Natural Linoleum Flooring Options*. Available at: <https://www.thespruce.com/all-natural-linoleum-flooring-1315060> (Accessed: December 7, 2022).

Mathur and Farouq (2021) "The carbon footprint of construction industry: A review of direct and indirect emission," *Journal of Sustainable Construction Materials and Technologies*, 6(3), pp. 101–115. Available at: <https://doi.org/10.29187/jscmt.2021.66>.

Ministerie van Onderwijs, Cultuur en Wetenschap (2021) *Verkoop TL-buis stopt vanaf september 2021. Led alternatief voor musea*. Available at: <https://www.cultureelerfgoed.nl/actueel/nieuws/2021/02/18/verkoop-tl-buis-stopt-per-1-september-2021.-led-alternatief-voor-musea>.

Potting, J. *et al.* (2017) *CIRCULAR ECONOMY: MEASURING INNOVATION IN THE PRODUCT CHAIN*, www.pbl.nl. 2544. The Hague, Netherlands: PBL Netherlands Environmental Assessment Agency. Available at: <https://www.pbl.nl/sites/default/files/downloads/pbl-2016-circular-economy-measuring-innovation-in-product-chains-2544.pdf> (Accessed: December 12, 2022).

Rijksdienst voor Ondernemend Nederland (no date) *Transformatie en het Bouwbesluit 2012*. 2SLWO1310. Available at: https://www.rvo.nl/sites/default/files/2019/01/Transformatie%20en%20Bouwbesluit%202012_0.pdf (Accessed: December 10, 2022).

Scheenaart (2021b) *Using local energy and material flows to redevelop the Applied Physics building*. Master Thesis. Technical University of Delft.

Scholts *et al.* (2020) *Status studentenhuysvesting 2020: Een onderzoek naar het huidig tekort wat betreft een passend woningaanbod, met betrekking tot studentenwelzijn, voor studenten te Delft*. Available at: <https://wijwonendelft.nl/wp-content/uploads/Status-Studentenhuysvesting-2020.pdf> (Accessed: December 11, 2022).

Schouten, T. (2022) "TU Delft wil flink groeien in drie steden: '40 procent meer studenten voor 2030'," *AD.nl*, 18 September. Available at: <https://www.ad.nl/delft/tu-delft-wil-flink-groeien-in-drie-steden-40-procent-meer-studenten-voor-2030~a7753162/> (Accessed: October 26, 2022).

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Telegraaf (2022) "'Woningtekort wordt komende jaren alleen erger'," 10 February. Available at: <https://www.telegraaf.nl/financieel/1321428662/woningtekort-wordt-komende-jaren-alleen-erger> (Accessed: October 26, 2022).

The Tile Emporium (2021) *How to recycle and reuse old tiles*. Available at: <https://www.thestonetileemporium.com/blog/how-to-recycle-and-reuse-old-tiles/> (Accessed: December 6, 2022).

Thomas, G. (2019) *Fluorescent Lamp Recycling*. Available at: <https://www.azom.com/article.aspx?ArticleID=8020>.

Data of Building 22 (Plans, sections, detailing etc.)

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 studio is called Architectural Engineering. It is a wide term in which the technicality of using different strategies to deal with reclaimed building materials fits. The master programme and master track Architecture have a focus on buildings and the constructive principles behind it. These elements are important within the research and project.

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

The proposal of the transformation of building 22 can be inspirational to the TU Delft, since the building will lose its current function within a few years. In a broader framework this research and project can be an example of how different strategies can be used to deal with reclaimed building materials.