

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

The graduation plan consists of at least the following data/segments:

Personal information	
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Studio	
Name / Theme	Architectural Engineering Studio 14
Teachers / tutors	<ol style="list-style-type: none"> 1. Monique Smit (Architecture) 2. Jan Jongert (Technical Research) 3. To be assigned (BT-tutor) 4. Tjalling Homans (TiSD-tutor)
Argumentation of choice of the studio	<p>I've always had a fascination for the technical part of architecture; this started with following the minor Archineering. During that minor I saw the Bucky Lab students making there mock ups and I knew I had to follow that project. Although I really enjoyed working on the project I did miss the overall connection to the building scale. I'm also very fascinated by renovation projects, but after following MSc2 RMIT I found that that was too specific or not what I expected it to be. I have therefore chosen the AE studio, because it's on a building/ architectural scale, based on technology and you can still focus on the existing stock. And I like the fact that you can determine your own graduation project and that makes it the perfect project to combine it with the requirements from the TiSD annotation</p>

Graduation project	
Title of the graduation project	Dutch Design Dock
Goal	
Location:	De Van Gendthallen, Amsterdam
The posed problem,	<ol style="list-style-type: none"> 1. World footprint; scarcity of resources 2. Building and Construction related waste in the Netherlands 3. Vacancy (of large scale cultural heritage buildings)
research questions and	What role can reclaimed materials that are both available in large quantities and within the coming years play in the redevelopment of vacant large scale buildings?
design assignment in which these result.	To transform the Van Gendthallen into a creative chain incubator; the Dutch Design Dock, that provides an accommodation for the growing creative industry that ensures the possibilities of upscaling. This design dock will focus on designing with reused materials and besides showing the entire process of an creative product (form idea to distribution), the building itself will be a showcase of how reclaimed materials can play a role in architectural implementations.

This research paper focuses on three problems; the scarcity of resources, the waste generation in the Netherlands and the vacancy (the existing stock). The third problem mentioned could even mean an increase of problem number two. What if nothing will be done for these vacant buildings? What if these buildings were just demolished? Or since a lot of these buildings are listed, they will be left alone and therefore only deteriorate even further and will need to be demolished after all? This would only mean that the percentage of building and (de)construction related waste will increase. Not only does the gaining of new building materials have a huge impact on the environment; the demolition of buildings and therefore the processing/dumping of this waste does too. Instead of designing new buildings that use new materials, the focus (of the designer) should shift to reuse. Starting with the reuse of the existing stock; this could be in both finding a new purpose/function for these vacant buildings, but also looking at the buildings as a collection of resources. With careful analysis of the building and demolition the already used materials (building components) can be used as is in a new design. This would mean less building related waste and a decrease in the need for new building materials; therefore reducing the environmental impact. According to the Vacant NL there's a large amount of vacant buildings in the Netherlands from the 17th-21st Century. A lot of these 17th-21st century buildings are part of our national heritage (the Netherlands has 61.833 listed buildings). An article on ArchiNed mentions that in 2012 two million square meters of these listed buildings was vacant. The Van Gendhallen in Amsterdam is one of these buildings. They indicate that a (temporary) solution could be utilizing creative entrepreneurship and innovation. And this is exactly the direction of the program for my graduation studio. The creative industry is getting more important for the Dutch Economy and every year there are 400 people looking for a workplace in Amsterdam alone. These are mostly located in a creative incubator; but the problem with these places is that there's no focus on the growth of these companies. A solution could be a creative chain incubator; a place where they focus on the value chain of a creative product. This chain starts at the conceiving of the idea, to the creation to the distribution of the product. Interesting is that in Netherlands there isn't really a design museum, like other countries do have. In this graduation project the Van Gendhallen will be transformed into the 'Dutch Design Docks'. It will become a place for artists to work and collaborate, following the structure of a value chain. It will also become a place where visitors can experience the entire process behind a creative product; this could be supported by leisure functions such as an exhibition hall, museum or even a theatre. To realise the 'Dutch Design Docks' the Van Gendhallen have to be transformed; this will be done using reclaimed materials, which is the focus of the thematic research paper. What kind of waste flows are there in Amsterdam and how could these be used in the redesign. The paper will focus waste streams from the two main contributors to the annual waste production, the building industry and the general industry itself; as these will most likely generate a waste flow that is both large in quantity as regular in flow. Based on this two scenarios will be mapped; the renovation of offices and the harbour of Amsterdam. The goal of the research paper is to find out what role waste materials, that are both available in large quantities as within the coming years, can play in the redevelopment of vacant large scale halls. This will result in a small catalogue of possible design implementations of the found materials.

Process

Method description

The following methods will be applied during the making of the research paper:

Literature research

The biggest part of this paper will be based on literature research; this research has been divided into several topics that will both contain general research for the graduation project as well as specific topics for the thematic research paper. Leading books for this research will be:

- Addis, B. (2012). *Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling*. Taylor & Francis.

- WRAP. (n.d.). Reclaimed building products guide. In Material change for a better environment (Ed.), *A guide to procuring reclaimed building products and materials for use in construction projects*.
- Bob Falk, & Brad Guy. (2007). *Unbuilding: salvaging the architectural treasures of unwanted houses*. Newtown: The Tauton Press.

Case studies

As part of the literature research, several examples of realised buildings have been studied. This has been done to get a better idea of the current process; what steps are usually taken. What are the most common materials; their origin and new application. What can we conclude from these projects and what's there to learn.

The projects chosen for the case studies have been chosen from three leading books in the research, although these books also contain examples of buildings consumer waste; the case studies focussed on projects using waste from the industry.

- Bahamón, A., & Sanjinés, M. C. (2010). *Rematerial: From Waste to Architecture*. W.W. Norton & Company.
- Addis, B. (2012). *Building with Reclaimed Components and Materials: A Design Handbook for Reuse and Recycling*. Taylor & Francis.
- Hinte., E. V., Peeren., C., & Jongert., J. (2007). *Superuse: Constructing new architecture by shortcutting material flows*. Rotterdam: 010 Publishers.

Research of the location

Research towards the location will be both done in the form of literature research, analysis and site visits. The literature part will focus mostly on Amsterdam as a whole and the waste streams and vacancy in general. The analysis will focus on the Oostenburger islands and the Van Gendthallen itself; the context of the graduation studio. What's the DNA of the location, what is wanted or needed on the location?

Research by design

A second method applied in this research paper is research by design. Research by design can be done using a large variety of methods. For this graduation project the method used will be sketching. It is important to see (design) what can be made using the building components/materials found. But also the other way around; it is important to design what the location needs and use this as a guideline for searching for materials.

Mapping

In order to find reclaimable materials different scenarios will be set. These scenarios will then be mapped, which will result in a list of possible materials.

Choosing materials

In order to determine which found materials will be further research, certain guidelines have to be formulated. These guidelines will consist of both general criteria and the potential architectural applications.

Criteria

Available in large quantities:

The Van Gendthallen is a building of more than 12.000 square meters; this means there is a lot of material needed to redevelop this building. Designing with reclaimed materials can be a difficult process in itself; in order to simplify this the first criteria is 'availability in large quantities'.

Available within the coming years:

Since a lot of materials are needed to redevelop the Van Gendthallen; besides knowing if they will be available in large quantities we will also need materials that will be available within the next five to ten years. It's unrealistic to wait for a specific beam that might or might not be salvaged from a building the will be demolished over twenty years.

Ready to reuse:

To further simplify the design and building process the materials have to be ready to reuse. Some minor processing might still be needed, such as cleaning or refurbishing, but the focus of this paper is using materials that can be reused as is. Not materials that go into the recycling process to create brand new products.

Innovative applications possible:

There aren't that many projects realised using reclaimed materials, but the ones that have been realised often use the same kind of materials. The 20 foot cargo container is a good example of this and has resulted in an entirely new architectural category of its own. Although it's unlikely there will be very out of the box implementations of reclaimed building materials; it would be interesting to see if it's possible to create a new type of application.

Potential architectural application

Vacant large scale buildings are the context of this research paper. Since their size limits the guarantee of fire safety; it is often difficult to redevelop these properties. In order to help with this bigger problem; the architectural implementations of these materials have to benefit the redevelopment of these large halls. The possible architectural applications have been narrowed down to the following three categories:

Structure:

Since these historic halls are often on a scale of their own it's regularly necessary to create multiple layers in these buildings to make in economically attractive to redevelop. To which extend can the found materials play a role in realising a secondary structure in these halls?

Façade:

Another option in redeveloping these large scale halls is dividing then halls into different compartments, maybe even adding outdoor spaces to the programs. Even though this goes against the flexibility these buildings have to offer; it's often done to reduce the size of the complex and make it more approachable for the human scale. The Hallen in Amsterdam are a good example of this. By dividing the halls into separate building parts; it's necessary to create façade elements. Even though it's an overall reuse of an building from the 1900s, the newly build parts do have to follow the current demands of the bouwbesluit. How could these materials be implemented in the creation of an façade?

Interior:

What seems to be a success in redeveloping large scale halls is treating the building as if it is one large urban landscape. Within this landscape several volumes are built that can relate more to the human scale; these volumes could follow the same principles as the structure and façade applications. Besides these volumes, these urban interiors often contain other architectural elements that help scale the building. These could be moveable partition elements or platforms and even furniture. To which extend can the found materials be used in the creation of an urban interior?

Literature and general practical preference

Addis, B. (2006). *Building with Reclaimed Components and Materials*.

- Bogdanovic, J. (2011). Municipal waste generation (CSI 016/WST 001) Retrieved 13-05, 2015, from <http://www.eea.europa.eu/data-and-maps/indicators/municipal-waste-generation/municipal-waste-generation-assessment-published-4>
- Centraal Bureau Statistiek. (2014). *Leegstand in Nederland anno 2013*. Den Haag: CBS Retrieved from <http://www.cbs.nl/NR/rdonlyres/E5CDDD84-6EDD-40B5-8B43-B87C2DA86EFB/0/leegstandinNederland2013.pdf>.
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- Gemeente Amsterdam. (2011). *Leegstand in Amsterdam: inzet op gebruik, aanpak van leegstand*. Amsterdam: Gemeente Amsterdam.
- Gemeente Amsterdam. (2015). Vacant Offices. Retrieved 28-05, 2015, from http://maps.amsterdam.nl/leegstaande_kantoren/
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- Hinte., E. V., Peeren., C., & Jongert., J. (2007). *Superuse: Constructing new architecture by shortcutting material flows*. Rotterdam: 010 Publishers.
- Repurpose. (2014). Projecten. Retrieved 15-05, 2015, from <https://www.repurpose.nl/blog/category/projecten/>
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- Rijksoverheid. (n.d.). Leegstand kantoren. Retrieved 12-05, 2015, from <http://www.rijksoverheid.nl/onderwerpen/leegstand-kantoren>
- Rijkswaterstaat Leefomgeving. (2010). Afvalcijfers: Geproduceerd afval in Nederland. Retrieved 04-03, 2015, from <http://www.rwsleefomgeving.nl/onderwerpen/afval/afvalcijfers/landelijk-niveau/geproduceerd-afval/>
- WWF. (2014). *Living Planet Report 2014*. European Policy Office.

Reflection

Relevance

This graduation studio is both generic and specific. It deals with the problem of vacancy the building & construction related waste. It could function as a general example on how to design using reclaimed materials, but can be seen as more specific because it will focus on the area of Amsterdam and could therefore function as a manual/guideline that shows which materials can be found in that area specifically.

Time planning



