"Rethinking the Unwanted"

Exploring the possibilities of reusing waste-materials in the construction of new architecture
**PROBLEM STATEMENT**

The word ‘waste’ has a negative connotation in itself, it literally means ‘unwanted materials’. In Holland we yearly produce about 60 million tons of these unwanted materials, varying from plastic cups to building components. Most of this waste goes straight to the blast furnaces where it burned to produce "green" electricity. But is that really the most we can get out of these materials?

I think architecture can play an important role in prolonging the lifespan of products and materials by reusing waste materials as a building material.

We live in a world in which we have lost the perception and value of materials. Before the industrial revolution products were handcrafted and made only out of locally available materials. Then with the industrialisation of processes and globalization of international trade an era of mass-production came into being. The prices of raw-materials, transport and production dropped to a minimum.

We call it a consumer society. Everything is about consumption. Our whole economic system is focused on making products and getting them to our front door. But 99% of the stuff that we buy is thrown away within 6 months (Story of Stuff)! What happens to the objects after that is something we are not used to think about very much. As long as we put our grey bag onto the street on the right day and occasionally take a walk to the glass-containers we feel we are doing the right thing.

What we don’t tend to realise is that we dispose a whole load of valuable materials and resources. Throwing away a plastic bottle is discarding a small amount of finite crude oil that nature has worked billions of years on to form out of fossil rests. The same accounts for cardboard, metals, textiles and much more.

In a time where scarcity of resources is to be one of our main issues (vd Dobbelsteen), it is necessary to address waste from a different perspective. To see waste as a resource of valuable materials. The European Union defines waste as "an object the holder discards, intends to discard or is required to discard" but as Kevin McCloud states "Waste is just stuff in the wrong place".
// RESEARCH OBJECTIVE

The Research Objective is to create a set of generic guidelines on how to incorporate waste-materials in the design of new buildings with a focus on harbour-areas in transition.

It is my aim to show which waste-flows and abundant materials circulate in harbour areas and research into ways of transforming or reusing those materials as building materials.

The Objective is to demonstrate that architecture can play an active role in sustainable waste-management and reducing transport-emissions by incorporating local waste-materials in architectural design.

// DESIGN OBJECTIVE

Waste has a negative connotation. It is not only unwanted but also a material flow that is unpredictable and not homogeneous. To create beautiful architecture out of it will be a challenge.

To me, the summum of beautiful architecture lay in the Islamic world where ornament and natural light create a magical inner space while its dome structures define a city's horizon. It is a defined typology with a rich history but also a vivid present-day discussion on its appearance in western societies.

The objective of my design is to bridge this apparent contradiction and create an architecture that shows that any type of aesthetics or building typology can be built out of waste-materials.
How can waste-materials from the current industries of the Merwe-Vierhaven area be reused in the building of a new mosque for its future inhabitants?

Step 1: General Research
- How does the collection, separation and recycling of waste work (in NL)?
- Which materials are suitable for reuse (without recycling) and which are not?
- How have realized buildings dealt with waste-materials?

Step 2: Generating Design Conditions
- Which waste-materials can be found in the area of Merwe-Vierhavens?
- What should the architecture of a local Dutch mosque look like?

Step 3: Conclusions
- Which available waste materials in the area of Merwe Vierhavens can be used in the design and construction of a local mosque?
### Methodologies per Subquestion

#### How does the collection, separation and recycling of waste work (in the Netherlands)?

- Interview with Hendrik Vd Vijver (Van Gansewinkel)
- Possibly contact professors of the Mastercourse of Waste-Management at the University of Wageningen
- Literature research
- Lecture about “Our Daily Waste” in the theme of the “Circular City” at Pakhuis de Zwijger in Amsterdam

**Site visit to a separation line, waste collection and Milieupark**

#### Which materials are suitable for reuse (without recycling) and which are not?

- Interview people in the waste-management
- Interview designers and architects that have worked with waste-materials

**Mockups and tests with materials**

#### How have realized buildings dealt with waste-materials in design and construction?

- Interview architects that have realised buildings/projects with waste-materials:
  - Jan Jongert / Superuse Studios
  - Arie Van Ziel / Studio Content
  - Bas Van De Berg / De Benne
  - Duwan Doepel / Doepel Strijkers Architecten
  - Denis Oudendijk / Refunc

**Literature study**

(*Superuse*, "From Waste to Architecture", ...)

**Analysing precedent projects/buildings with waste-materials**

#### What are the current industries of the area of Merwe-Vierhaven?

- **Site visits to Merwe-Vierhavens and mapping the area**
- **Desktop research on current industries**

#### What are the future plans for the area?

- **Literature and desktop research in papers and studies by the municipality**

#### What defines the typology of a mosque?

- **Literature study about the architecture mosques**
- **Analysing 2 or 3 existing mosques**

#### How do existing mosques deal with materiality?

- **Literature study and desktop research on the architecture of mosques built merely with local resources: Vernacular Architecture**
In our current world of overconsumption and climate change, I believe it is necessary to look at a way to make better use of the materials that are locally available. Waste-materials are to be found everywhere and often their quality and properties are underestimated. We as architects are not used to think in terms of reusing materials for our buildings. We prefer to design something, than think of a nice materialisation and then go and order it from wherever they produce it. But I think recycling and reusing will become an import issue in the coming decades. If architects would be able to save materials from landfills and blast furnaces and give them a new life in buildings, I think we are making a big step forward towards a more sustainable world where resources are used in a circular process rather than a linear one. My graduation project will be a design for a specific use in a specific context but my aim is to create more general awareness. In my research I will focus therefore on finding solutions that can be applicable in other contexts and other uses also; a set of generic guidelines for the use of waste-materials in building constructions.

// LITERATURE
- “Superuse - constructing new architecture by shortcutting material flows”, van Hinten, Peeren en Jan Jongert, 010 Publishers, Rotterdam, 2007
- “ReMaterial - From waste to architecture”, A. Bahamon, WW Norton, 2010
- “The architectural representation of the Islam- Muslim commissioned mosque design in the Netherlands” E. Roose, Amsterdam University Press, 2009
- “Pionieren aan de Maas: gebiedsplan Merwe-Vierhavens”, Stadshavens Rotterdam, 2009