

Graduation Plan

J.A. Wilders

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Personal information	
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Studio	
Name / Theme	Architectural Engineering (AE) / Flow
Teachers / tutors	Architecture: Mo Smit Research: Jan Jongert Technology: Maarten Meijs
Argumentation of choice of the studio	<p>I have a fascination for architecture, technology and sustainability. Combining these three aspects will reinforce each other and they will get the best out of the design in my opinion. The technology part of designing has always interested me, because I strongly believe you first need to know how something is build and how it works before you can understand the value of the design. The Architectural Engineering, also known as the Intecture studio, is all about the integration of architecture and technology. The studio includes designing, building performance, construction engineering, climate design and building systems. I really believe in the synergy between the engineering and the architecture discipline. I am eager to learn the creative and inventive use of the engineering and architecture knowledge in a complex architecture design.</p> <p>The Architecture Engineering studio gives me the opportunity to define my own graduation project and the freedom to choose a context. In this way I can define my graduation project which fits the best to my technical fascinations.</p>

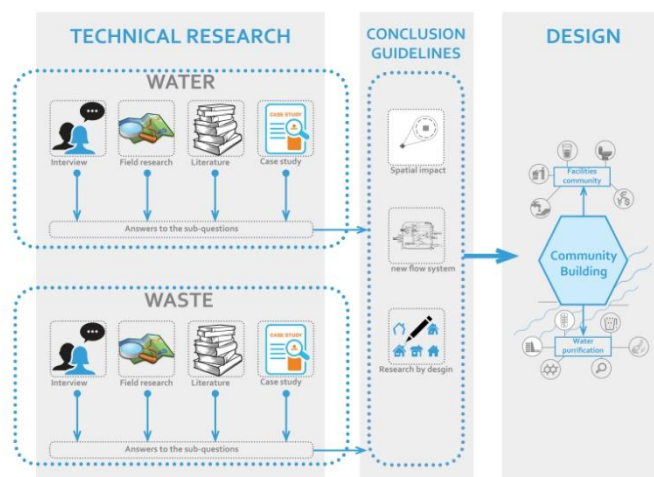
Graduation project	
Title of the graduation project	An integrated purification system to manage the water and waste flows in the kampungs in Bandung.
Goal	
Location:	Kampung Cigondewah in Bandung, Indonesia
The posed problem,	In the poorest areas of the urban kampungs in Indonesia, floods, earthquakes, polluted riversides, poor living conditions and risk of eviction are serious threats to the

	<p>safety and health of the kampung inhabitants. Population growth, changing industries, growing textile industry, urbanization, intensive agriculture development influences these problems. All these aspects are increasing demands for the water use in Indonesia.</p> <p>Settled industries and kampung growth changed the water quality drastically through discharge of domestic and industrial wastewater into nearby rivers and water streams. Even though they contribute to the problem it causes them serious health hazards. Although they know that pollution causes the water problems, the people in the kampungs do not see the pollution in the water streams as a problem. Actually they dump most of their own waste into the river because it is the easiest way to take out the trash. Only when trash clogs the system and floods occur they acknowledge a problem. Besides throwing waste directly in the river, waste is being dumped on the streets and burned when enough has accumulated. The latter shows a lack of awareness for the consequences. The people do not see the risks for their health.</p>
<p>research questions and</p>	<p>Overall Design Question: How can a community building in the kampung reflow the water and waste cycles to improve the living qualities for the residents in Bandung, Indonesia?'</p> <p>Technical Research Question: 'How to improve the water quality in the kampung by managing all the water and waste flows with a purification system where waste management is integrated?'</p>
<p>design assignment in which these result.</p>	<p>With this technical research it is the intention to provide a guideline for my design process of a community building in the kampung Cigondewah, which must be the central point of the re-managed water and waste flows to improve the living qualities in that kampung. In the community building water purification, river treatment waste management an waste reuse are integrated.</p>
<p>Process</p>	
<p>Method description</p>	
<p>Different methodologies will be used during my graduation process to find answers for he stated design and technical questions. The answers must be serve as a guideline to sole the state problems. The design will come from the provided guidelines and additional design specific research. The methodologies which have</p>	

been utilized are:

- Field research: the existing water and waste flows were researched during a three-week field trip to the kampungs of Bandung. The current water facilities and their flows are mapped. This is also done for the waste flows in the kampung. Special attention was paid to the current flows of reusing the waste. Possible options for the specific location of the community building are considered.
- Interviews were done during the visits in the kampung, this provides the needs and wishes of the residents. A couple more specific interviews made clear how the residents think of possible new systems to manage the water and waste flows.
- Literature research to water treatment systems is done. Different purification techniques for treating grey- and black water are analyzed. To determine which system will work the best in the kampung all systems are qualified on aspects as maintenance, spatial impact etc. and rated. The rating systems helps to define which technology will work best in the kampung. Technologies of processing waste to reuse it as a new source are research in the literature as well.
- Case studies are analyzed to provide insight in the different techniques in order to the find out what is needed for certain capacities and specific contexts. Based on the analysis assumptions are made for what will probably work in the kampung. The case studies gives a global overview of the spatial impact the systems will have in the kampung.
- Research by design will be use mainly in the second part of the graduation year. During the design process, different options will be developed and rated in relative to each other, to come to be able to make the best design decisions.

This are the intended methodologies for my research and design process (see diagram). While the graduation process is going on it is possible that some methods will change bit, or the assumptions of the underlying decisions will change. However this is the overview of how the graduation process will be addressed.



Literature and general practical preference

Anindrya, W., Setiani, B., Sudradjat, A., Latifah, I., Roosmini, D., Smits, A., Meijerink, S., (2013) Water and Sanitation in Urban Slum: A case from Bandung municipality, West Java, Indonesia, Bandung, Environmental Engineering, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung.

Darmawan, A., Kilbergen, W., Suwono, G., Suwono, A. (2013) Feasibility of Recovering Energy from Municipal Solid Waste to Generate Electricity, Institut Teknologi Bandung, Indonesia, Technol. Sci., Vol. 45, No. 3, 2013, 241-256

Fulazzaky, M.; Gany, A. (2009) Challenges of soil erosion and sludge management for sustainable development in Indonesian. J. Environ, 90, 2387–2392.

Greenpeace (2013) Toxic Threads: Polluting Paradise, Greenpeace International, published 17 April 2013

Loyd, C., Bordman G., Michelson, D. (1991). Anaerobic/aerobic Treatment of a Textile Dye Wastewater , Pre-printed for Mid-Atlantic Industrial Waste Conference, July 15-17, Morgantown, WV.

Thou, A. (2014) Community and Social Responses to Land Use Transformations in the Nairobi Rural-Urban Fringe, Kenya. Available online: <http://factsreports.revues.org/435> (accessed on 11 July 2014).

Minke, R., Rott, U. (1999), Anaerobic Treatment of Split Flow Wastewater and Concentrates from Textile Processing Industry;, Wat. Sci. Tech., 40(1), 169-176.

Sarojini, I. Wardhani, C., Fatimah, S., Barlinti, Y., Setiawan, B., Tarsidin, M., (2008) Institutionalization of Sustainable waste Management: An Extension Program of Environmental Awareness in Jakarta and West Java, The Tokyo Foundation under the Joint Initiatives Program (JIP) 2007/2008, University of Indonesia, Indonesia

Seshadri, S. and Bishop, P.L. (1994), Anaerobic/Aerobic Treatment of Selected Azo Dyes in Wastewater , Waste Management, 14(2), 127-1317.

Taller, R.Y., (2009) Incorporating rainwater-harvesting and retention basins design into urban development paradigms in Greater Bandung, Indonesia, Water and Urban Development Paradigms, Taylor & Francis Group, London, ISBN 987-0-415-48334-6

Tilley, E. L. U., C. Lüthi, , & Zurbrügg, P. R. a. C. (2014). Compendium of Sanitation Systems and Technologies. 2nd Revised Edition. . In P. Donahue (Ed.). Dübendorf, Switzerland: Swiss Federal Institute of Aquatic Science and Technology

WSP (2011) Lessons in Urban Sanitation Development, Indonesia Sanitation Sector Development Program 2006-2010, water and Sanitation Program, World Bank

Zaoyan, Y., Ke, S., Guangliang, S., Fan, Y., Jinshan, D. and Haunian, M. (1992),

Reflection

Relevance

Because the growing population and the density in the kampung a good and healthy water cycle is desired to improve the living quality for the people of the kampung. A better managed water and waste cycle will reduce the health risks. This makes my graduation project valuable in the social framework.

Allot of research on water flows and waste recycling is already done. This has led to several generic opportunities for solutions to manage these cycles. The relevance of my research is to investigate in which of these methods fits the best in the specific context of the Cigondewah kampung in Bandung. The most important is to implement these system in the existing situation with respect for the existing building typology and the way of living. Working to a concept while involving the local people is desirable, otherwise the system will most probably not work. The location, the Cigondewah kampung and its morphology is specific, so it asks for a specific solution.

Time planning

The planning of workload for the research and design part is given in the scheme below. This scheme gives a global overview of the workload and the specific deadlines for this graduation year. It must serve as a guideline for myself to complete all aspects of the graduation in time.

