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	Maäyan Daniël
Student number	4198646
Telephone number	
Private e-mail address	

Studio	
Name / Theme	Complex Projects
Teachers / tutors	Luc Willekens, Pier Jennen
Argumentation of choice of the studio	1) The ability to turn research into a design concept, in which the research is not merely confined to the level of the architectural style but also reaches the domains of other disciplines. 2) The fact that the assignment deals with a matter, smart cities (on energy e.g.), which lies into my personal field of 'interest'; climate change and sustainability.

Graduation project	
Title of the graduation project	Hybrid Hydro Habitat
Goal	
Location:	Amsterdam Zuid-Oost
The posed problem,	The future of the area will need to cope with an increased need for water safety measures and a sustainable renewable energy transition. However, with increased urbanization, and thus hardened area, how can these matters be met simultaneously and contribute to a valuable spatial configuration?
research questions and	Main research question: Which spatial/architectural qualitative elements can contribute to an integral energy system? Sub-questions: 1. Why is the current system un-integral?

	2. How could (waste-) water contribute to energy efficiency? 3. What are its spatial implications? 4. How could architecture accommodate and contribute to such a system?
design assignment in which these result.	A search for spatial elements which can contribute to an integral energy system

The design assignment constitutes itself in the form of a search towards spatial elements which are a direct result of the integral energy system and which will contribute to spatial quality. While a precedent research ('seminar research'), on an optimum integral energy system in which simultaneously water measures are taken into account, will reveal the optimum spatial configuration and elements in order to accommodate such a system, the design assignment reaches beyond this dry matter of application of such spatial elements and searches for these elements to contribute to spatial quality. Hence, solving existing and future spatial and maybe even social problems.

Process

Method description

While the previous semester mainly focused on the research on the topic at stake; the integral energy/water system, the upcoming semester will shift towards a research by design approach. This way the analytical, typological and literature research done in the previous months will be integrated into the design (see literature list). However, in order to integrate the research fully through all scales, additional research will be inevitable.
Hence, as we start of on the conceptual scale, a research will be done on the influence of certain design positions and architectural elements on the integral energy system and visa-versa. This will be related further to the context of the location and the implied effects of the implication of such a concept. Reference studies, and correlation studies (literature and analytical) will therefore be held in this phase.
The second phase will consist mainly of the realization of a design on the level of the plans and sections. Typology studies will be held in order to understand the impact of certain spatial configurations on the usage/experience of the space. Furthermore, this phase will also consist of research through design.
The third phase will consist of the materialization of the project. Once more the search for integrated energetic elements into the design is sought on the level of the detail. This will be done once more through reference studies and material typology studies.

Literature and general practical preference

Hooimeijer, F. (2011). *The tradition of making Polder Cities*. TU Delft: Delft

Timmons, D., Harris, J. M. & Roach, B. (2014) *The economics of Renewable energy* retrieved 05-05-2017 from http://www.ase.tufts.edu/gdae/education_materials/modules/RenewableEnergyEcon.pdf

Bollinger, L. A. & Dijkeman, G.P.J. (2016) *Evaluating infrastructure resilience to extreme weather – the case of the Dutch electricity transmission network*. Retrieved 10-05-2017 from http://www.tbm.tudelft.nl/fileadmin/Faculteit/TBM/Onderzoek/EJTIR/Back_issues/16.1/2016_01a_07.pdf

World Energy Council (2015). *World Energy perspective; The road to resilience- managing and financing extreme weather risks.* Retrieved 11-04-2017 from http://www.mmc.com/content/dam/mmc-web/Files/20150921_Resilience_extreme_weather_PRINT.pdf

Gemeente Amsterdam (2011). *Structuurvisie Amsterdam 2040; Economisch Sterk en Duurzaam.* Retrieved 15-4-2017 from https://www.amsterdam.nl

Shah, Y.T. (2014). *Water for energy and fuel production*. CRC press: Boca Raton

Isaacson, M., Gudell,, J.D., Miller, J., Wiese, J., Wilson, R. & Center of Neighbourhood Technology (2014). Urban flooding and energy efficiency: Laveraging Community Action. Retrieved 04-05-2017 from http://www.elevateenergy.org/wp/wp-content/uploads/Urban_Flooding_and_Energy_Efficiency1.pdf

Vewin (2012). *Dutch Drinking Water Statistics; The water cycle from source to tab*. Retrieved 10-5-2017 from http://www.vewin.nl/SiteCollectionDocuments/Publicaties/English%20_publications/Vewin_Dutch_Drinking_water_statistics_2012.pdf

Hooimeijer, F., Meijer, H. & Nienhuis, A. (2009). *Atlas of Dutch Water Cities*. SUN: Amsterdam.

Van dribbelen, C., Koeze, R. & Monchen, E. (2013) *Waterproof Amsterdam*. Waternet: Amsterdam

Van Hoogdalem, L. (2015*). Geschiedenis van het riool in Amsterdam*. Retrieved 30-4 2017 from http://www.riool.amsterdam/geschiedenis-van-het-riool-in-amsterdam/

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De Brauw, H. Kluck, J., Stapel, W. & Tilma, M. (2012). *Water en Energie*. Feiten over energieverbruik in het stedelijke waterbeheer. Retrieved 12-5-2017 from http://www.verenigingvpb.nl/_images/ck_files/RIONED_Water_en_Energie_lr.pdf

Atelier GroenBlauw (n.d.). *Hammarby Sjöstad, Stockholm, Sweden*. Retrieved 15-5-2017 from http://www.urbangreenbluegrids.com/projects/hammarby-sjostad-stockholm-sweden/

Magara, Y. (n.d.) *Industrial Water*. Retrieved 11-05-2017 from http://www.eolss.net/Sample-Chapters/C07/E2-19-02-04.pdf

Visser & Smit-Hanab (n.d.) *De nieuwe warmteweg.* Retrieved 11-05-2017 from http://www.vshanab.nl/nl/projecten/detail/de-nieuwe-warmteweg-dnww

World Energy Council (2015). *World Energy perspective; The road to resilience- managing and financing extreme weather risks*. Retrieved 11-04-2017 from http://www.elevateenergy.org/wp/wp-content/uploads/Urban_Flooding_and_Energy_Efficiency1.pdf

Potz, H. & Bleuzé, P. (2012). *Green-Blue Grids, manual for resilient cities*

Kristinsson J., van den Dobbelsteen, A. (2012). *Integrated Sustainable Design*

Hettiarachchi, H. & Ardakanian, R. (2016). *Environmental Resource Management and the Nexus Approach*

Shell (2008). *Shell Energy Scenarios 2050*

Younos, T. & Grady, C. A. (2013). *Climate Change and Water Resources*

Willson, W. Leipzig, T. & Griffiths Sattenspiel (2012*). Burning our Rivers*

Mukherjee *et al., (2016). Effect of Urbanisation on Flood*

Reflection

Relevance

This project seeks to turn problems into potentials. Where often solutions are sought within specific domains of science this projects seeks to set an example for all scientific fields in order for them to reach beyond the boundaries of their domain and search for interdisciplinary solutions. This in order to prevent colliding solutions and provide quality on these zones of intertwining knowledge.

Time planning

See next page

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Semester 1							
Phase 1		Site model and Choice of Topic					
1	Modelling	Modelling	Modelling	Modelling	Modelling	Modelling	Modelling
2	Modelling	Modelling	Modelling	Modelling	Modelling	Modelling	Modelling
3	Location Analyses	Location Analyses	Location Analyses	Location Analyses	Location Analyses	Location Analyses	Location Analyses
4	Location Analyses	Location Analyses	Location Analyses	Location Analyses	Location Analyses	Location Analyses	Location Analyses
5	Location Analyses	Location Analyses	Location Analyses	Location Analyses	**P 0.5**	Location Analyses	Location Analyses
Phase 2		Research					
6	Literature Study	Location Analyses	Literature Study	Location Analyses	Literature Study	Location Analyses	Literature Study
7	Literature Study	Location Analyses	Literature Study	Location Analyses	Literature Study	Location Analyses	Literature Study
8	Literature Study	Location Analyses	Literature Study	Location Analyses	Literature Study	Location Analyses	Literature Study
9	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions
10	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	**P 1**	Extrapolations and Conclusions	Extrapolations and Conclusions
Phase 3		Concept					
11	Typology Research	Typology Research	Typology Research	Typology Research	Typology Research	Typology Research	Typology Research
12	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions	Extrapolations and Conclusions
13	Visualizations	Visualizations	Visualizations	Visualizations	Visualizations	Visualizations	Visualizations
14	Literature Study	Typology Research	Literature Study	Typology Research	Literature Study	Typology Research	Literature Study
15	Research by Design through Scenario Studies	Research by Design through Scenario Studies	Research by Design through Scenario Studies	Research by Design through Scenario Studies	**P 1.5**	Research by Design through Scenario Studies	Research by Design through Scenario Studies
Phase 4		Finalizing					

16	Typology Research	Typology Research	Typology Research	Typology Research	Typology Research	Typology Research	Typology Research
17	Research by Design through Scenario Studies	Research by Design through Scenario Studies	Research by Design through Scenario Studies	Research by Design through Scenario Studies	Research by Design through Scenario Studies	Research by Design through Scenario Studies	Research by Design through Scenario Studies
18	Typology Research	Typology Research	Typology Research	Typology Research	Typology Research	Typology Research	Typology Research
19	Visualizations	Visualizations	Visualizations	Visualizations	Visualizations	Visualizations	Visualizations
20	Visualizations	Visualizations	Visualizations	Visualizations	**P 2**	Visualizations	Visualizations
Semester 2							
Phase I		Concept development					
21	Literature Research	Literature Research	Schemes	Literature Research	Literature Research	Schemes	Literature Research
22	Model Study	Model Study	Schemes	Model Study	Model Study	Schemes	Typology Research
23	Typology Research	Typology Research	Schemes	Model Study	Typology Research	Typology Research	Literature Research
24	Model	Model	Model	Model	**P 2.5**		
Phase II		Design development					
25	Typology Research	Schemes	Typology Research	Schemes	Typology Research	Schemes	Typology Research
26	Research by Design	Research by Design	Research by Design	Research by Design	Research by Design	Research by Design	Research by Design
28	Research by Design	Research by Design	Research by Design	Research by Design	Research by Design	Research by Design	Research by Design
29	Research by Design	Research by Design	Research by Design	Research by Design	**P 3**	Research by Design	Research by Design
Phase III		Materialization					
30	Typology Research	Research by Design	Typology Research	Research by Design	Typology Research	Research by Design	Typology Research
31	Research by Design	Modelling	Research by Design	Research by Design	Research by Design	Research by Design	Research by Design
32	Modelling	Research by Design	Research by Design	Research by Design	Research by Design	Research by Design	Modelling
33	Modelling	Modelling	Modelling	Modelling	**P 3.5**	Research by Design	Research by Design
Phase IV		Finalizing					
34	Research by Design	Research by Design	Research by Design	Research by Design	Final Visualisations	Final Visualisations	Final Visualisations

35	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations
36	Final Visualisations	Final Visualisations	Final Visualisations	Modelling	Modelling	Modelling	Modelling
37	Modelling	Modelling	Modelling	Final Visualisations	**P 4**	Final Visualisations	Final Visualisations
Phase V							
38	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations
39	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations
40	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations
41							
42	Final Visualisations	Final Visualisations	Final Visualisations	Final Visualisations	**P 5**		