Study Plan

Personal information

<table>
<thead>
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<tbody>
<tr>
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Studio

<table>
<thead>
<tr>
<th>Theme</th>
<th>Hyperbody: NS&amp;IA</th>
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<tbody>
<tr>
<td>Teachers</td>
<td>Dr. N. Biloria &amp; Dr. H. Bier</td>
</tr>
<tr>
<td>Argumentation of choice of the studio</td>
<td>Exploring digital techniques in the design process</td>
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Title

<table>
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<tr>
<th>Title of the graduation project</th>
<th>Rotterdam Blaak Revised</th>
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Product

Problem Statement

When the Markethall is ready for use, the square in front of station Rotterdam Blaak will not have the market as most important function anymore. The municipality is exploring the options for a new urban plan for the Binnenrotte, but no concrete decisions are made. A Masterplan for this area by KCAP (2007) shows that in the future a new railway station will be needed, since the amount of travelers has increased with more than 150% in the last 5 years.

This problem statement brings me the following research questions:

- What functions are needed on this square in order to make the square more lively on non-market days?
- What should the new railway station look like in terms of accessibility, taking in account the growing amount of passengers?
- What is the best solution for the square regarding to the future plans for this area?

The design assignment is to propose a new square and railway station on the site of the Binnenrotte. This project must not be seen as a railway station on a square, but as a square as a whole.

Goal

The main goals of this graduation project are, as specified by hyperbody:

- To remember: Recognize, list and define both traditional and contemporary climate conscious environmental design solutions, from technical and design implementation perspectives.
- To understand: Identify and describe a design brief for a chosen location based on issues specific to urban problematics and climatic concerns
- To apply: Computationally discover the role of multi-objective optimization techniques as design tools and apply this knowledge to the chosen site and multi-scalar (urban, architectural, component level) design development process.
- To analyze: Analyze and compare computational design outputs as regards their efficiency, energy harvesting and generation capacities as well as differentiate and choose simulation outputs by means of interfacing quantitative and qualitative (aesthetics, social performance etc.) means. Evaluate: Integrate computational and design thinking modes to derive and argue
for the chosen solution space by relating it with the design brief, performative efficiency and architectonic sensibilities.
- To create: Design (including digitally produced prototypes/models) and justify the chosen architectural formation as result of relational information and material affordances in time and assess its impact on the urban context within which it is embedded in both intrinsic and extrinsic manner.

More specific, related to my individual design, the goal is to explore and use digital techniques in the design process in order to create a new landscape for the Binnenrotte. Accurate data of environmental factors will be used in order to create geometry of this new square. The end product should answer the research questions, and should solve the current problem statement of the unused square, old railway station and growing capacity of passengers.

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<th>Process</th>
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<tr>
<td><strong>Method description</strong></td>
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<td>The design process is mostly based on digital software. Rhino, Grasshopper and Processing are the main software that are going to be used. A parametric model will be made in Grasshopper, which means that the outcome can easily be changed when decided that the input parameters should be changed. Research on this software needs to be done, since there are a lot of plug-ins which are never used before.</td>
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<tr>
<th>Theoretical and practical references</th>
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<tr>
<td>Research on the amount of users of the different functions around the station will be done in order to get an accurate image of how the square is used. This data will be stored in an excel file which is the main parameter and starting point for the new square. Environmental parameters like solar radiation and sun hours will also be studied, e.g. to get the most sun hours on the square or to get the most daylight on the underground railway platforms. A little technical research is needed on behalf of understanding the software.</td>
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<tr>
<td>Reference projects are going to be studied, as well as on the internet as projects from previous students with a similar approach to their design project. For the courses Research Methods and Media Studies, scientific research will be done on the topic sustainable architecture using digital techniques.</td>
</tr>
<tr>
<td>Literature which is going to be used:</td>
</tr>
<tr>
<td>- Bier, H. and Knight, T., Digitally--driven Architecture, Stichting Footprint, 2010</td>
</tr>
<tr>
<td>- DeKey, M., Systems Thinking as the Basis for an Ecological Design Education, School of architecture, Washington University, St. Louis</td>
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<tr>
<td>- Ednie-Brown, P., All-Over, Over-All: Biothiing and Emergent Composition</td>
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<tr>
<td>- Weinstock, M., Evolution and Computation, p. 27-43</td>
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<td><strong>Relevance and output</strong></td>
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<td>The outputs where this graduation project is aiming for, as specified by hyperbody:</td>
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<td>- Background Research: Systematic identification, categorization and analysis of theorized and applied environmental design solutions within varied urban contexts from a range of media resources;</td>
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<td>- Context interpretation and program formulation: Critical understanding of urban problematics from both sociological and climatic perspectives (built upon the background research) for</td>
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formulation of problem specific program of demands as well as novel socio-cultural opportunity creation perspectives;
- Design Driven Technical Competence: Basic computational design thinking based skills for multicriteria optimization coupled with creative application of these technical skills for execution of performative design solutions from a qualitative and quantitative perspective;
- Analytical skill: Logically categorized and analyzed simulation outputs outlining the relational values of multiple parameters showcasing energy efficiency, climatic control, aesthetic values as well as socio-spatial impact;
- Synergy: Creative and innovative manner of fusing technical, artistic, social, spatial and environmental aspects in relation with the program brief to showcase a holistic performance driven design process;
- Communication and Presentation: Clarity of purpose, quality of product (digital and analogue), technical and design application skills, argumentative and articulation skills, subject engagement and commitment as well as evaluative and analytic rigor for proposing the chosen spatial formation.

More specific for the individual design:
- A design on a site which is feasible to create (since the municipality of Rotterdam has ideas for the future, but no clear proposals for the new square and railway station);
- develop skills of digital software which is visible in the end product;
- creating a landscape which responds to the future plans of the Municipality of Rotterdam;
- creating a square and railway station that is socially acceptable in terms of sustainability, after doing scientific research on this topic.

### Time planning

Scheme of the division of the workload of the graduation project in the 42-week timeframe (P1-5). Compulsory in this scheme are the examinations at the middle and end of the semester, if required, the minors you intend taking and possible exams that have to be retaken. The submitted graduation contract might be rejected if the planning is unrealistic.

**P1:**
1.1: Introduction
1.2: Workshops & Lecture
1.3: Group work on Pavilion
1.4: Workshops & Lecture
1.5: **Final presentation** of the pavilion (group work)
1.6: Startup Graduation project
1.7: Site analysis & meeting
1.8: Site analysis & meeting
1.9: **P1 Presentation** site analysis:
Interactive presentation showing concept, information models, and behavioural diagrams:
- 3D-4D parametric models showing the design within the site at the phase of concept design
1.10: First ideas for creating geometry

**P2:**
2.1: Developing concept
2.2: Developing concept
2.3: Workshops
2.4: Paper review Media Studies
2.5: **Final submission** position paper Research Methods
2.6: **Final submission** paper Media studies
Holidays
2.7: Draft design (plans, sections, façades, 3D/4D parametric model)
2.8: Draft design (plans, sections, façades, 3D/4D parametric model)
2.9: **Final presentation P2:**
Interactive presentation showing concept, information models, and behavioural diagrams:
- 3D-4D parametric models showing the design within the site at the phase of schematic design
- Urban draft 1:1000/1:500;
- Program of requirement;
- From 3D model obtained sections, plans, and views at appropriate scales 1:1000 - 1:1
- Draft design (plans, cross-cuts, facades) 1:200;
- Graduation plan.

Digital documentation of all above including 300 words abstract describing project submitted via wetransfer.com.

First meeting with Building Technology tutor.

P3:
3.1: Decide to workout area, starting concept façades and materialization
3.2: Concept construction/materialization
3.3: Façades 1:200, Sections 1:100
3.4: Façades 1:200, Sections 1:100
3.5: Façades 1:100, Sections 1:50
3.6: Façades 1:100, Sections 1:50
3.7: Sections 1:20, Details 1:5
3.8: Sections 1:20, Details 1:5 + prototype
3.9: P3 Presentation:
Interactive presentation showing concept, information models, and behavioural diagrams:
- 3D-4D parametric models showing the design within the site at the phase of design development
- From 3D model obtained sections, plans, and views at appropriate scales 1:1000 - 1:1
- plans, facades, cross-cuts, 1:200 / 1:100
- part of the building, plan and cross-cut 1:50
- façade fragment with hor. and vert. cross-cut 1: 20
- details 1:5
3.10: Review comments, update planning, bring all aspects together.
Digital documentation of all above including 300 words abstract describing project submitted via wetransfer.com.

P4:
4.1: Define focus points, Update comments.
4.2: Update Comments, Start layout.
4.3: Bring all aspects together, finish layout
4.4/4.5: P4 Presentation:
Interactive presentation showing concept, information models, and behavioural diagrams:
- 3D-4D parametric models showing the design within the site at the phase of construction design
- theoretic and thematic support of research and de-sign + reflection on architectonic and social relevance
- From 3D model obtained sections, plans, and views at appropriate scales 1:1000 - 1:1
- situational drawing 1:5000 / 1:1000
- plan ground floor in situ 1:500
- plans, facades, cross-cuts 1:200 / 1:100
- part of the building, plan and drawings 1:50
- façade fragment with hor. and vert. cross-cut 1: 20
- details 1:5
- Structure and materialisation design for CNC production
- Physical models developed from the 3D parametric model by means of Rapid Prototyping and CNC-production; photographs documenting production, assembly process, and final result

Digital documentation of all above including 300 words abstract describing project submitted submitted
P5:
4.6-7: Making final drawings and starting eventual model.
4.8-9: Starting poster layout and presentation format, improving drawings to presentation style, finish the model and/or prototype; structure and materialisation design for CNC production
4.10/4.11: P5 Presentation:
Interactive presentation showing concept, information models, and behavioural diagrams:
- 3D-4D parametric models showing the design within the site at the phase of construction design
- From 3D model obtained sections, plans, and views at appropriate scales 1:1000 - 1:1
- situational drawing 1:5000 / 1:1000
- plan ground floor in situ 1:500
- plans, facades, cross-cuts 1:200 / 1:100
- part of the building, plan and drawings 1:50
- façade fragment with hor. and vert. cross-cut 1:20
- details 1:5
- Structure and materialisation design for CNC production
- Physical models developed from the 3D parametric model by means of Rapid Prototyping and CNC-production; photographs documenting production, assembly process, and final result.
Digital documentation of all above including 300 words abstract describing project submitted via wetransfer.com.

Attention
Part of the graduation (especially in the MSc 4) is the technical implementation of the building design. Therefore a Building Technology teacher will be involved in the tutoring team from the P2 presentation on. This should be taken into account when writing the study plan / personal graduation contract, with respect to the time planning as well as in the relation to the content (e.g. statement, method and /or relevance).