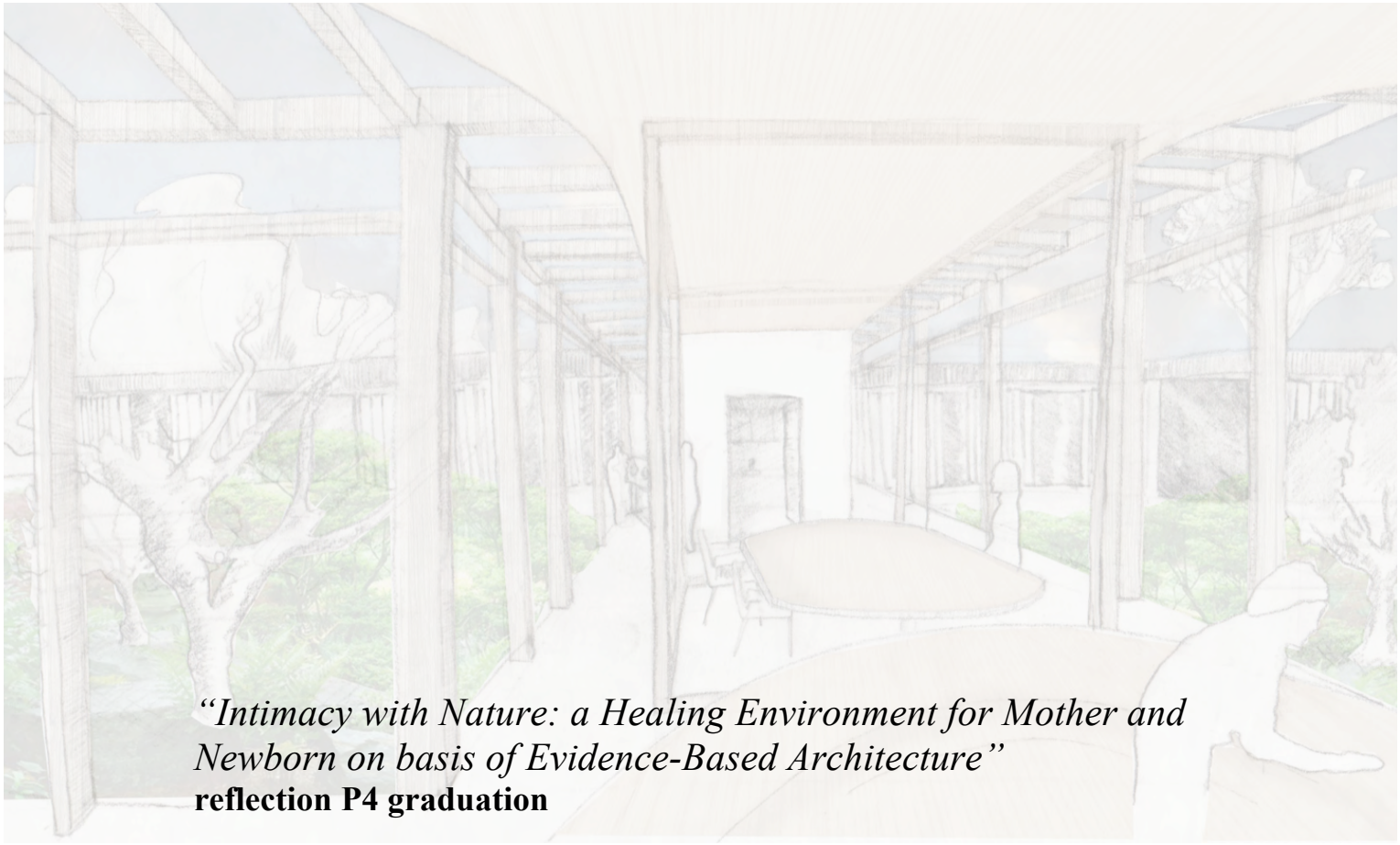

"Intimacy with Nature: a Healing Environment for Mother and Newborn on basis of Evidence-Based Architecture"
reflection P4 graduation

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Reflection

In this report I will reflect on the graduation research project and process.

In my P2 research I investigated by means of a literature study and interviews how spatial and functional evidence-based design measures for a 'healing environment' could be apprehended for an improved design for a Neonatal Intensive Care Unit (NICU). Newborn intensive care is care for critically ill: being transferred from the mother's womb to the intensity of a neonatal unit can be overwhelming for an infant, especially one who is premature and has not fully developed yet.

For the design of the graduation project, I designed a new built facility for a NICU on location of the *Academisch Medisch Centrum (*AMC) in Amsterdam. In Amsterdam, the two academic hospitals, *VU Medisch Centrum* (VUmc) and the AMC admit to the current changes going on in health care, and see alliancing by means of merging both facilities on one location as their ambition (on the long-term) (Grift & Velden, 2013), The NICU is housed as an expansion on the existing building structure.

Aspect 1 **the relationship between research and design**

The research brought forward directives for architectural design solutions for a NICU that answered to quality themes essential for a healing environment. In my design this research gave me tangible starting points for designing, which affected different scales and spheres of influence. An overview is given in the appendix.

Looking back I found the P2 research very helpful in establishing constraints for starting the conceptual design, e.g. visibility of entrances from the nursing stations. However, because of the plurality of quality themes researched, it was difficult to pinpoint one particular aspect that would be the 'leading theme'. Along the design process, and on basis of instinctive/emotional choices rather than academically supported, the design ambition became to create a healing environment in which light and nature in and around the building could be experienced in full spectrum. This brought together tangible measures for spatial design, configuration and building physics from the research on the one hand, and the architects' fascination to facilitate experiences and emotions by design. The fascination with nature led to the design of different types of rooftop parks, that on their turn were the anchor points for the configuration inside the building set up in a park-like manner. From here, the design detached itself from the research: whereas the design until this point was mainly decided by the research (read: 'engineering' measures), from here more instinctive/emotional choices were leading (read: 'architectural' measures). Looking back on this, it is to say that I experienced switching between the engineer (P2 period) to the architect (from P2 on) difficult in the beginning. I think that in this respect the building type was making this even more complicated: as hospitals are designed primarily for its function rather than for its esthetics, design choices that were instrumental to the hospital's functioning easily could be the 'winning argument' over a esthetic choice. The commentary after the P3-presentation provided that the building was to orthogonal, function-driven and showed a corporate style, rather than the healing environment I proposed. From here I started to look into what I really wanted to reach as an architect. This resulted in the ambition of creating intimacy with nature: creating spaces that would stimulate social interaction (a communal experience) would be the overarching ambition, and light and nature (as individual experienced) would be the instruments I as an architect would deploy to reach this. From here, the architect gradually was taking over from the engineer.

In conclusion, my first first approach to the design issue was finding an engineering solution to the design issue. Thus, quality themes were served by solution in the material, the construction and building physics. In hindsight I think that for designing a 'healing environment' one should take the underlying notions of what makes a healing environment 'healing' should be taken into account. In my case I pose that social interaction or communal experience contributes to healing, and if I were to start over my design from the very beginning, I would focus on the embodiment of this.

Aspect 2 - **the relationship between the theme of the graduation lab and the subject/case study chosen by the student within this framework (location/object)**

The Architectural Engineering-graduation lab intends to educate graduate architecture students to invent tools for an architect, in order for him/her to design a more efficient/economical/innovative building, or improving the process of building to address the demands of modern (and complex) society. This graduation research delivered directives that would make the process of designing a health care facility (in this case: a NICU) easier for an architect. On basis of evidence-based design from literature, directives for spatial, functional and technical solutions were posed that addresses emotional, physical, developmental, medical and social needs for infants, families and hospital workers. Before drawing a concept design, the outcome from the research was direct input for formulating a programme of requirements.

I think the research and the design suits the intentions of the graduation lab in a unique fashion: rather than inventing technical improvements for construction methods or use of materials, the research starts from the notion that by means of an architectural design the effects of the physical environment affect the healing process and well-being of the patient and health care staff. The method of translating (abstract) healing environment-principles into (tangible) directives is a rather theoretical approach to technical innovation (e.g. prototyping), but nonetheless offers an insight in how an architect can enhance the designing profession. Undoubtedly, the limitations of the method are that, although the healing-environment principles are presented as evidence based, the directives are not suited to prototyping.

In conclusion, I think the graduation research has an exceptional approach to AE design brief: it takes a theoretical method in answering to a complex design brief. It offers new useful tools for architects, albeit without direct practical proof.

Aspect 3 - **the relationship between the methodical line of approach of the graduation lab and the method chosen by the student in this framework**

I experienced the setting up of your own design context and research subject as a challenging factor for the architectural design. First, all the features of designing a NICU (subject to the P2 research) needed to fit the design case for the *Academisch Medisch Centrum* (AMC). This included inventing how this new NICU facility could be put in function with and notwithstanding any other function in the hospital. Therefore, first the organisation of the hospital and the health care process needed to be understood. Secondly, adjoining to the (future) plans to accommodate a new-built NICU on the rooftop of the existing structure, demanded for an understanding of the structural implications of this. These two aspects, in combination with the choice for designing a complete NICU facility, using the full roof-plot of the low-rise building demanded for extensive research before and during the design.

In review I would have chosen a smaller scale project (e.g. a single room) to go more into depth in the embodiment of the research into the design. In bringing together all aspects (architecture, facade, climate design, structural engineering etc.) many puzzles outside the main topic of research had to be solved. I think that by choosing a smaller scale project, it can be better focused on the essence.

Aspect 4 - **the relationship between the project and the wider social context**

This research contributes to the understanding of the complexity of an architectural design for a hospital building. As this research shows, designing a NICU brings along many requirements and constraints that demand for a scientific or systematic approach from the architect. Secondly, contemporary architects perform in a time that the character of health care services is changing, e.g. due to the rise of e-health and health treatment in small practice. Moreover, contemporary health care is pressurised externally to deliver higher quality for an affordable price (Grift & van Velden, 2013). Thus, in modern health care design, the architect needs to account for many factors he/she is not knowledgeable in.

This project helps in exploring the fundamentals for designing a healthcare facility. The Neonatal Intensive Care is care for the most delicate patients, and I think that the understanding of the design principles for such a facility can be augmented to understanding other facilities in the hospital. The research delivers a holistic perspective on understanding the design issues that appeal to other departments in the hospital. Conversely this strength also pinpoints the exact problem of the architect/an architectural design: the design is understood and explained on a very broad level. In order to really create a healing environment, the architect is strongly reliant on engineering disciplines.

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Appendix – Relationship between Research and Design

Research		**Design**	
Directive	Measure affecting	Consideration	Choice
Acoustically absorptive surfaces reduce reverberation and, therefore, sound levels at a distance from the sound source. When possible, two perpendicular walls should be covered with sound absorptive surface materials. (Audimute, 2014)	building physics, interior design	- reducing glass surfaces - positioning of the air supply channels	- two perpendicular walls in every single family room and incubator rooms. - Air supply channels are positioned in a plenum outside of the single family room and incubor room.
Shading devices should be easily controlled to allow flexibility at various times of day, and should either be contained within the window. shading devices patient rooms (Gm-design ltd, 2014)	Building physics, facade	- types of sunshading - placement of sunshading (inside or outside facade)	- louvers that can be controlled in two directions (both horizontally and vertically) to comfort maximum flexibility of light intensity insde.
Nursing station(s) should be located within close proximity and direct visibility of the entrance to the infant care area. The control point should be situated so that all visitors must walk past the station to enter the unit. The design should provide for maximum visibility of the nursery from the workroom or charting area. (Mahle & Kinday, 2008)	Spatial configuration	- configuration of nursing stations, charting area, reception, single familyrooms and incubaor rooms.	- fully transparent operational corridor, allowing for the medics to have maximum visibility of the single family/incubator rooms from the nursing stations and charting areas. - visibility of NICU entrances from the nursting stations. - central reception where an entrance card needs to be requested to go inside the NICU area.
The need for privacy for infants and families should be addressed by minimising traffic flow past each bed. (Whyte, 2009)	Spatial configuration	- distinction between medics operational traffic along the patient rooms	- distinction between the entrance for family/public ‘family gallery’ that is perpendicular to the ‘operational corridor’ that can only be directly reached by medics.