0. Introduction
This report provides a critical reflection on the graduation project and related process, developed in the context of the Architectural Engineering studio at the TU Delft. This graduation resulted in a technical research and redesign of a typical pre-war apartment block in Amsterdam-West.
Firstly the specific graduation project will be considered in the context of the graduation studio, comprising both a critical reflection on the individual process, in the methodical context of the studio, and on the relation between the studio’s theme and graduation topic. Furthermore, a description of the relation between the technical research and final design is provided, followed by a consideration of the project in a wider social context.

1. Subject and case study choice
The Architectural Engineering graduation studio is about creating a realistic and integrated design, in which the architectural vision, driven by a personal fascination, is expressed on every level of the project: façade, structure, climate, materialisation, space and program. If done well, this results in a smart and integrated design. However, it all starts with an observation followed by asking the right question. The observation was a fascinating contradiction that can be found in the built environment: we are happy when surrounded by life of any kind and we simply need nature to provide us with life essentials, yet most of us live in a world that consists of bare rock that is even at the cost of life. In the context of the studio’s overall focus, in combination with my interest and effort to contribute to a more sustainable planet, this observation was followed by a broad research question: ‘How can architecture contribute to life?’ Life, in this sense, not only related to functioning of ecosystems but also to the quality of life. Because the question is rather broad, answering it demands thinking on every level of the building: (the building’s structure (i.e. properties of the load bearing and façade), the building’s functioning (i.e. HVAC, energy and water) and the building’s experience, related to the architecture.) This stimulates to integrate all the aspect relevant for solving the problem into one solution, minimizing the risk of a fragmented approach.

To facilitate a case-study choice, three different contexts were provided by the studio: A12 - zone Utrecht, Amsterdam Sloterdijk area, both complex urban areas, and the coastal area. However, there was flexibility in choice, for it should be driven by the student’s fascination. The research question of this project asked for a rather extreme case-study to illustrate and underline the full potential of architecture in contributing to life. None of the provided case-studies were extreme enough to do so, for there was sufficient space transformation and there was a relatively high level of nature (i.e. life) present in all three areas. For this...
reason a different case-study has been chosen: a typical pre-war apartment building in the highly dense Amsterdam-West (fig. 1 & 2). This is an area that on the one hand consists of very typical architecture, which needs to be respected, while on the other hand comprises an extreme form of bare rock built environment with hardly any space to for transformation. Being able to transform this built environment into a living environment again, would illustrate the applicability of the research, while underlining the full potential of architecture in contributing to life.

2. Graduation method and process
The methodical line of the Architectural Engineering studio broadly consists of two parts. The first semester mainly consists of the problem statement ("Why?"), the technical research ("How?") and the context analysis ("Where?"). The focus is on the technical research, providing conclusions as main input for the design later on. The second semester is all about the design ("What?") starting off by translating the research conclusions in combination with the location analysis into a context specific architectural strategy. This methodical line is reflected in the method of this graduation project, for the research question resulted in three more general context independent design principles, which were later on translated into a case-study specific design strategy (fig. 3&4). It is important that the graduation method broadly follows this methodical line, to provide a clear structural overview at all times. However, to be able to define such a clear structure, it is essential not to become too much attached to this linear strategy. At the start of this graduation process this was attempted, though soon resulting in a rather slow process and a hard time in making a step towards designing. After a few months, the importance of having a more iterative process became clear. First of all, by already start designing in the first semester, one is able to reflect on whether the research forms the desirable starting point for the design. Furthermore, only by thinking ahead, the project can quickly become more specific and the direction of the research will become clear. Finally, throughout the whole process new insights will be found that are relevant for both research and design. For example, during the second semester of this project, some design principles that were considered to be important based on theoretical research, turned out to be less relevant when applying them in to a specific context. In the end an effective process is all about the balance between on the one hand having a clear linear structure, while on the other hand having a more iterative process, consisting of both design and research. This way the clear structure will provide an overview of the project at all times, preventing becoming lost in a complex process, while at the same time thinking ahead will facilitate to create this overall structure and to quickly form an image of what will be the final design.
3. Relation between research and design
As mentioned in the previous paragraph, there is a very clear relation between the research and the design in this graduation project. The research focuses on answering the question ‘How can architecture contribute to life?’ from which three generic context independent design principles are derived. In the design phase, these principles are translated into a context specific design strategy. (fig. 3&4) The design has two major objectives: illustrating (1) and testing (2). First of all the application of the principles to a case-study illustrates the value and potential of the research. Secondly, providing a contextual test-case generates valuable information related to the applicability of these theoretical principles. After all, the research does not consider a specific architectural, social or ecological context. This last aspect results in a two direction relation between research and design. Not surprisingly, in the final stage of the project some parts of the technical research could be reconsidered. For example, the technical research paper mainly focused on the importance of contributing to ecosystem functioning, considering creating quality of life as a welcome secondary effect. Though, in the design stage it became clear that contributing to quality of life is the major driver for being able to create a self-reinforcing dynamic process. After all, creating something that people simply want is the strongest incentive for change. In the end the relation between research and design can be seen as a two way direction, in which the research conclusion provides an essential input for the design, while the design provides valuable information and new insights in the context of applying the research conclusion.

4. Graduation project in a wider social context
This graduation project started with the very broad question: How can architecture contribute to life? A question every person should ask him or herself, if we want to move towards a sustainable human planet. This question resulted in a project that illustrates the huge potential of architecture in this respect: by designing according to life principles derived from research(fig..) even an extreme location as Amsterdam-West can be drastically improved on every level, while at the same time increasing the density. Most definitely, applying these principles will have a similar or even better effect in a different context. This way architects can play a key-role both in contributing to the functioning of ecosystems, which is highly relevant if we are to sustain our lives on this planet, in contributing to the quality of life. And even though, we always tend to look for technical solutions first, this project underlines the importance of considering the quality of life as well. After all, it is this approach that creates the opportunity of moving from a static design towards a self-reinforcing process: gradually transforming the built environment into a living environment again.