GRADUATION PLAN

United Nations Environmental Council, Manhattan, New York

Personal information
Name: Wesley Duis
Student number: 4029143
University: Delft, University of Technology
Faculty: Faculty of Architecture
Graduation lab: MSc3 – Materialisation – SADD

Theme: New authority on Environmental health
Argumentation of choice: Global sustainability is a worldwide problem, and also found in Architecture this studio starts where the future begins.
Teachers: Ir. H.A. van Bennekom
Title: The fluid network; United Nations Environmental Council
Version: 11-01-2013

Introduction
For the studio of Strategic Architectural Design Development (SADD) of the Materialisation chair; the United Nations Environmental Council needs to address the problems of the environment in the world. Gives the attention that it deserves and function as the coordinating organisation to solve these world problem of energy, waste and biodiversity. This architectural icon of sustainability will represent the necessity for sustainable environments in the essence of the design philosophy. The design area is within the United Nations territories in Manhattan. The different connections of the UN plot within the grid of the city are important even as the connection to the East River.

Urban interventions
The new headquarters needs to communicate sustainability worldwide and will be intervene in an urban area with a high density that will be absorbed in the existing terrain and buildings.
Important for my design process is the analysis of the whole. This is for example how the urban environment and the current situation of the United Nations with its buildings and surrounding works. These facts will be used in the design. The surrounding and the context of the new design has different aspects of time in which it operates. How it used to operate, how it operates now, and in the future. This will be researched through perception of the environment, and trying to understand the human activities there.
Through the urban analysis these operations are seen and understood. From this point of view the new design is broad into this operation for the urban situation. During designing the new building we have to look at the past (previous designs and architectural visions), the current and the future, so it can operate together with the context in these aspects of time. The new design brings also an addition to the current context. This is seen as the vision of the architect, that can bring change to the context in a positive way. The design will not only be designed within typology, these study of types can only succeed if there is an understanding in the previous design, and the approach needs to be universal to the past the present and the future on any location in the world.
For my personal design, there is a start with understanding the current context, through the use of perceptual and spatial practise of my own vision and the vision of the users. If there is an understanding, there is a starting point to use the more technical part, the plans of previous master plans, or buildings and more technical drawings. From this it is important to see in references if it is an optimal use of the design. How can the new headquarters be absorbed in the terrain and the urban area in a sustainable way?

It is my ambition to create a strategic composition that can handle these different layers of the site and the city, and the aspects of time. Looking to the future, the city of New York has ambitions to change the riversides of Manhattan. Only the route along the United Nations is ignored as a waterfront by the municipality. In the master plan, the waterfront will be converted to a recreational area, this will create more public space for the city. This in-between zone between the city, the East River, and former living area’s is also used as an accessibility area. Public transport goes through these regions.
The UNEC building should form a dialogue with the existing landscape of several layers, which are connected to the current context of the United Nations in Manhattan that brings a new identity for sustainability. The building itself should be sustainable, but my personal goal is to make the direct surrounding, in terms of the existing UN platform sustainable as possible. The new building is an authority for sustainability, this should not be an exposition of sustainable solutions. Or be a collection of green interior spaces and green building skin. The sustainability should be visible from the outside, very well integrated in the building and function as a whole, it has to be an optimum bioclimatic design.

**What is sustainability?**
The meaning of sustainability is not an universal agreed definition, there are many different views and meanings, of how sustainability can be achieved. The definition is adjusted and changed during time. The provided main meaning of the word sustainability is “maintain”, “support” or “endure”(a).
Since the fuel crisis of the 80’s the word sustainability has been more used for our environment.
During the meeting of the General Assembly of 1987; the definition of sustainable development was;

“sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”(a)

Since the first definition of 1987; there have been many variations and extensions. As in the sense of sustainable development, sustainable, sustainability, sustainable future, sustainable society. All these terms address different groups or solutions.

In architecture; sustainability is often hard to understand with numerous issues and uncertainties. Mostly sustainability is brought into the design in a later part of design development. There is also a term as “green architecture” were the sustainability is the main design purpose that often leads to a unattractive architecture. There are also ratings for sustainability that define green in architecture as LEED and BREEAM. Some of the architectural projects are not possible to validate by these rating systems, the standard calculations of old systems that are certified can only be used. In other scenario’s the sustainability systems will be replaced to succeed the label for example by replacing the original systems by less appealing ones.

**Conclusion**
The UNEC building should be an architectural icon of sustainability. This icon is created by using the unused space of the plot as a green natural landscape. The new building should first address the opportunities that are on the plot and the larger scale of Manhattan.

Manhattan is one of the most dense areas of New York and has a big economic importance.
“At the moment 55% of the world citizens are already living in urban environments. In 2050 this amount will rise even more. Predictions saying that it will rise up to 70% (6,4 billion people). In Europe and North America already 80% of the people are living in the city and this percentage will even rise to 88% according to predictions in 2050. There are 450 cities with over 1 million citizens (20 over 10 millions)” (a).

In comparison the citizens in urban areas with a high density are having more environmental and health issues that need to be addressed then rural areas, this will be a good starting point for the new United Nations Environmental Council. Inside the area of the United Nations this should be one of the most important public buildings. The design task is that the building should be an energy zero building or even better so it can generate more energy than it uses. This task should be addressed in the architectural representation of the building and its features.
Some of the issues in an urban environment are; urban heat island effect, polluted rain water in city, water , demand of fresh water, insufficient capacity drainage systems, non-renewable energy system. In the new master plan there will be an energy grid introduced together with a water purification system. Also there will be a water storage system introduced with a storm water basin. In my personal design the UNEC will operate as a fluid network. This fluid network will be used as a filter for the city. The building will operate as the main operator in this fluid network that is connected to the master plan.

The climate of Manhattan can be described as cold winters with wind patterns that blows mostly offshore. The average coldest temperature is 0.1 °C. Spring and autumn are usually mild with low humidity. Summers are typically hot and humid. The average temperature is 24.7 °C. In night time the temperatures would raise through the urban heat island effect. “(...) The night time temperatures are raising between 13 and 15 degrees Celsius in comparison to what they would be without the effect”(a).

The building should address first the main aspects of this local climate and reflect this to the world. The climate issues of Manhattan will be solved through the façade. The building will partly use the former basement of the plot, this will save energy and create an large buffer.
The UN plot is one of the few left with an open green space that has a visual connection to the waterfront. Green spaces could reduce the air temperature in the summer by evaporation, the vegetation is “(...) capable of absorbing almost 50% of the incident solar radiation. The World Health Organization (WHO) recommends a minimum of 12m²/inhab of arboreous zone.” [10].

This plot has a good opportunity to use the open space for sustainability purposes and possibilities to include the building in this goal. The open space will be used as a park that filters the water of the city.

Some of my design goals are making use of the current landscape, the design won’t be high rise like the buildings in the surrounding area. By integrating in the platform, the design will be more sustainable and it will be a part of the current United Nations plot. The area around the architectural icons is important and should be maintained, the approach to the General Assembly is important.

An overview of my methods are firstly Phenomenology together with Praxeology, then if there is a clear understanding, I will use Typology of the designs that are important for my own design scope. And at the end to control this all there is a need for references of Typology. This process has to do with the technical background, with my previous studies.

In the future the urban environment will be having the most important environment and health issues. The new council will have to address the public the most. Together with the other councils, there will be a new start for a new world.

Literature and references

References:
03 - The Brundtland commission [1987] during General Assembly
04 - Toppeta, D. (2010), p. 3)
05 – Stuart Gaffin et al. 2012
06 - O.D. Corbella et al. 2008

Books:
Aalst, K., K. Duijvestein en M. van der Wagt [2001]; DCBA-kwartet Duurzaam Bouwen; Boxtel, Capelli, L.[2006] ; Self-sufficient housing : 1st advanced architecture contest; Barcelona
Duijvestein, K et. all. [2012] Uitgangspunten & strategieën voor een duurzaam ontwerp -Technne Press
Guallart, V. [2010] Self-sufficient City: Envisioning the Habitat of the Future - ACTAR
Jodidio, P [2009] - Green architecture now - Taschen GmbH
Kristinsson, J.[2002] - Integraal ontwerpen voor vitale architectuur – Aeneas
Moet, D. [2005] - Autarkie zelfvoorzienende woonwerklandschappen - Thoth
Pollio, M. Vitruvius. [1914-1960]. The ten books on architecture - Dover publications.
Thorpe, A. [2009]. The designer’s atlas of sustainability - Island press.

Articles:
Process and method
Research
- programmatic analysis
- urban analysis
- situation analysis
- formulation of architectural ambitions
- facade and construction research
- position text about the sustainability in the urban environment
- investigate sustainable design initiatives
- literature research
- reference analysis

Design
- master-plan design
- design-principles and goals
- strategic model studies
- integration sustainable design initiatives
- study user flows in building
- architectural integration basement of plot
- technical research and design

Design tools
- models 1:1000 / 1:500
- 3d models mass / and detailed
- sketches and drawings
- References
- functional schemes and illustrations

Planning
From the analysis of the master plan the next step will be to design the architectural form of the building and its floor plans. The design process will generate 3d models that include the circulation and the building mass. During the design process the sustainability opportunities will be included and researched. This study will be done using various tools, drawings and models. The integration of the sustainability features will have major implications for the technical elaboration of the design.
The detailed time span for each aspect will follow later on cause it is currently not possible to estimate this accurately. Since all the aspects will be researched during the design development.

Reflection
To make a sustainable building in both architectural ways; in composition and materialisation, it is also about plan were the building is going to be build. This ideal case study for a sustainable design is also where the value of this graduation project lies, in the scientific framework and the larger social area. This landscape and building can serve as an tangible example for sustainability as a start for the theoretic debate for creating a closed cycle eco system.

Methodology
The strategy I would use during the process, is a combination of own analysis and several case studies or references. This input may be used during the feedback process of the design, that can be found during the moments of validation.
The methodology for the design process will mainly be the ‘research by design’ method. This method combines the design and research in an optimal way, there will be a continuous connection between those two main aspects. The various feedback mechanisms ensures that a proper way of design decisions will be taken.
The graduation model shows the total study process, from the first preliminary research till the final design. The different aspects of the design process are also displayed. This process is from larger scale to detail, in between there is always a validation and an implementation of the different information and decisions.

Final products
The final product will be a design that is located on the United Nations area in Manhattan, the report of the design will contain a research on the buildings that is designed in a sustainable way. From the master plan research the personal design will be developed.
The strategy for approach is to obtain design techniques and design resources, these design techniques that can be used are Microsoft Office, Adobe CS5, CAD and Autodesk Maya. Design tools can range from textual explanations or reduced to technical drawings showing different colours, different schedules and line thicknesses can be used.
Fig. 01 - Overview connection city and East River

Fig. 02 - Elevation new UN Environmental Council