Graduation Reflection Report
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AE-Graduation studio
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The project “New West Energy” is about transforming and “sustainify” a larger area (neighborhood – city district scale) towards a more sustainable and self-sufficient alternative, also known as an Autarky. In order to achieve this Autarky the necessary processes in creating a self-sufficient area are analyzed together with the sustainable potential of the area. This resulted in a series of processes regarding food, water, thermal - and electrical energy and the functional quest to optimize these processes. This functional and optimization question, together with the situation analysis and the personal architectural ideas, should lead towards a coherent design resulting in the architectural building / project.
Relation between Research & Design

The research focused on the previous mentioned processes within the location of Amsterdam Nieuw-West. Found in the research was the need for more independence both energy as materially-wise for the users. In the far future it is likely the case that almost every household or consumer produces a certain amount of these flows, creating an enormous fine-grained grid throughout the country. However the current status of the system is a highly centralized one, in which factories produce large amounts of mostly a single product and wasting other products in the process. As a result the research concluded into a building that would combine these two “opposites” and create a central node in which multiple flows and products are combined and interconnected so that processes can benefit from each other.

In order to keep the processes “clear” the four processes chosen are electrical energy, thermal energy, water and food, which are according to the research the fundamentals in sustaining any form of society. Towards each system a funded strategy was chosen in order to meet the requirements that were set for the design. Electricity: production, Thermal energy: Production and re-using, Water: cleaning and Food: producing for own usage. This resulted into an elaborate scheme in which each process has its own place and is interconnected and dependent on the other process.

The first priority of the building and design is there for producing these flows. The secondary objectives are creating awareness by confronting people with the processes, the usage and mostly the waste and optimally using the produced materials and energy. Besides only focusing on the machines and their processes an extra layer was added to enhance the awareness function of the building, using and making the processes and waste flows more efficient. Next to this the project also takes the current wishes of the municipality and neighborhood into account by conforming to the strategy for the location and current technical demands. By placing functions that benefit from the created products inside or near the building the total efficiency rises and therefore making the building work better. As a result these functions also attract people and thus creates a broader public for this awareness, enlarging the total impact and sphere of influence of the building, thus creating a win-win situation.
Relation between Theme and Studio

The theme chosen: “Flow” in relation to self-sustainability is a theme that is highly suitable to the studio Architectural Engineering. The combination of engineering in ways of processes, amounts and details and architecture in ways of combining, creating the concept, composition and “looks” makes Architectural Engineering the most suitable graduation studio for this research and project.

Regarding the location, the research and theme can be used as a blueprint for other locations concerning self-sustainability on neighborhood scale. The research can be used as a framework in which to add or subtract multiple layers and flows to create a self-sustaining neighborhood and thus the research can be used as a starting point for multiple cases. Although made in a generic way the research is location specific regarding the amounts and figures of the concerning flows and demands. Based on a contextual study the general location for the design was chosen to optimize the chances of production. In this study the option of refurbishing or re-using other existing buildings was integrated but due to the elaborate program and the less useful locations and opportunities these were found insufficient. The exact location was a point of argument, because of the constant and ongoing research towards the processes and the small changes this asked in the location, scale and relations. Another challenge was that the researched processes did not exactly say something about the shape or size of the building and that this was open for own interpretation. Because of insufficient conceptual points at the start of the design, the constant occupation and needed attention of the processes the design had a rough and troublesome start. This resulted in that the location moved some times before eventually ending on the North-side of the Sloterplas, the configuration of the processes shifted and transformed multiple times and because of the initial total lack of design-leads into multiple designs and large changes in shape, configuration and conceptual points.

Concerning the object, the idea was to create a single building that forms a node that combines and connects multiple flows. Therefore the design should contain a single building or an ensemble of closely placed buildings regarding the concerned flows. In order to combine the processes a single building is preferable. However in order to have sufficient area for agricultural usage the building should be stretched and due to the need of a chimney for CO2 catchment and cooling of gasses the building is bound to get a vertically placed L-shape. However some processes contradicted one and other (agriculture: large area versus thermal energy: small and compact size) which also obstructed a simple and preferable start of the design.
Method and Context

The method “Form follows flow” did not seem to work and instead stalled the process. The form did not form or could not be achieved primarily on the processes and resulted in multiple optional designs. Besides challenges with the chosen method there were problems with the scale of the project. A pure mechanical program would demolish the whole architectural secondary objectives resulting in a “simple” mono-functional design purely based on the machines inside. The initial idea was to combine the interior demands with the locational demands resulting in a building that combines functions and benefits from the combination. This proved to be very difficult, mostly because of my own inability to combine these sometimes contradicting functions in a way that was preferable for the project. I was up until this point unable to create a clear concept for the building that would be the leading process for the design, instead the design and program remained the leading part and due to the ambiguous shape and sizes or orientations the design could not get a concluding shape and remained vague. This resulted in a set-back in the process, less motivation for the project and an overall doubt in the plan eventually resulting in a no-go at last year’s P4.

The result of this year’s, completely refurbished and changed building, is that the concept and story of the project are more in line with the research and project-goal in contradiction to last year’s project.

The method chosen this year is more expressive than last year’s building, the building in that sense represents the attempt of the building to become completely circular, however no process can be completely circular on a neighborhood-scale (at this point) resulting in a very efficient and re-using building. The shape of the building is a direct reference towards this attempt.

The façade however was something completely different. Due to lack of leads from the research and an almost blank context (lake and harbor surrounded, almost no factories or power plants with this program and non-located in cities) this proved very difficult. Eventually the material is a reference towards the neighborhood itself which is built in the modernistic way (light, air and space, but also steel, glass and concrete). The façade is divided in vertical lines emphasizing the verticality instead of the horizontal size giving it a more vertical appearance and by using this pattern around the complete building the project is “enwrapped” in this façade and seems a single building.

Location (Amsterdam Nieuw West, Sloterplas Noordzijde)
Social Context

The location on the north-west of the Sloterplas, located in Amsterdam Nieuw West was not merely chosen for its convenient nearby located services such as steam driven district heating, a gas-station, heat storage and the Sloterplas, a large man-made lake of 30m deep. Next to the machinery based programmatic services the location has multiple demands from the municipality such as creating more leisure on the waterside and creating a bustling new centrum of Amsterdam Nieuw West with the lake as center-point which is demanded by the municipality.

Instead of only producing the required flows and optimizing the flows in that way, making it almost unable for visitors or large amounts of people to take part in the process the building combines both machinery and supporting or depending functions in order to combine both technical and social aspects of the processes. Eventually creating awareness of the processes that electricity, heat, water and food go through before ending at the consumer, thus enlarging the sphere of influence. The agriculture is combined a restaurant, specialized in vegetarian dishes and thus primarily using the “homegrown” food and capable to feed at least 50-75 persons all year long. The thermal and water flows are supporting this agriculture in creating a constant climate in the greenhouses. Next to this supportive functions the thermal system produces enough heat and steam to power an electrical generator and use the heat in a counter-flow system to supply heat to the heat district and a thermal bath or spa. By combining these functions and giving the total building the function of a “gathering place/ neighborhood center” and museum the building functions not only as a technical node but also as a social node in which people can meet, greet, learn and relax. Eventually the building connects both technical as social, material flows and energetic flows and has the capability to in a later stadium when needed in the future to combine and transform the flows created by the end-user towards other flows needed.

Functional relations-scheme
Flow Attractor/Provider-scheme

Façade (South side)
Google Maps (2020) Building Form & Area
Design - January ’16 (First thoughts / Intuition)

Design – March ’16 (Form follows flows)

Design – June ’16 (Neighborhood shapes the building)
Design studies – September ’16 (Circular process & Single building)

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Design – October ’16 (Abstract Shape)