Reflection paper
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The title of the design studio is The Future of Structuralism, but what is structuralism?

Structuralism cannot be seen without the influence of post-war modernity in architecture as advocated by CIAM and later Team 10. Blom, Hertzberger, Van Stigt and Van Eyck are important instigators of the values and structural, social approach to architecture, a reaction against the brutalist and inhumane tendencies takes place. They assembled an ideology covering the social, human aspect of what new contemporary architecture should incorporate, focusing on buildings that facilitated equality and livability through a strong sense of human scale, humble materials and intended space for social interaction. These concepts can be seen in the work of all these architects, it can be a setup of repeating elements, spaces and parts of buildings in a structure to shape the whole of their building. These structural approaches theoretically allowed for flexibility, the ability to expand buildings in a continued pattern and the idea of a vivid building that was shaped by its users. The structure meant more to the individual architects than merely a gridded means of construction. However, while these aspects can be recognized in the work of all these architects, for each of them it supported different ideals and possibilities, resulting in a great variety of material execution, though always maintaining the social aspect as the ultimate motive for designs. In the end this diversity results in buildings expressing very much the individual characteristics of the different architects, though all sorted in the same style through their shared structural grid and humane focus. In short we can say that Structuralism includes 4 main elements: Building as a city Social interaction Open ended Units

![Diagram of Structuralism](image)

Figure 1: Diagrams of Structuralism
By M. Bettman, M. Habib, J. Hartmans and J. Hettema
The relationship between research and design

Research and Design go together. The Centraal Beheer building is a former office building and can be seen as an icon of Structuralism, designed by Herman Hertzberger. Nowadays the building is vacant and not in use anymore. The building must be revived, how can it be ‘recycled’ and add value to the city of Apeldoorn?

The main design assignment is to redevelop the Centraal Beheer building. A new function will be proposed with different technical requirements. Research is needed for a clear substantiation of arguments and design decisions during the process. Some types used during this design process are: Research by site and building visits, archive and literature research for the analysis of the building and reference projects for the design.

The first phase of the studio, p1 & p2, can be seen as research for design. In groups we started with analyzing five reference projects to get an understanding of the different approaches of Structuralism by different architects. (Cube houses, ’t Karregat, Burgerweeshuis, Raadhuis ter Aar and Tivoli Vredenburg) Through these visits we were able to put together a framework with the most important characteristics of Structuralism: Building as a city, Social interaction, Open ended and Units. Two site and building visits to the Centraal Beheer building gave a good impression of the building itself and its surroundings. And a certain insight in the experience of users of the building. In my opinion there was no hierarchy in the different levels, you almost couldn’t distinguish the inner street and the quadrants, it felt a bit like a maze.
Literature research on existing information, drawings of the building and the analysis from the previous groups gave us a starting point for our group analysis. We focused on the theme Unit and its rules and exceptions. After the analysis the design phase started, which can be seen as research by design. These two always go together.

During this phase, research into the function of a plastic recycle factory was essential to get an impression on how it works and what is involved. In general I have an understanding about the process and machines involved, but a specialist is needed to work out everything in more detail and check whether it is possible or not to place the function in the Centraal Beheer building.

I also used reference projects to get inspiration for new design ideas on different scale levels of the design.

At the group analysis phase we also made a scale model: part of the building in scale 1:50. Since it was the beginning of the project it helped a lot to get a better understanding of the design. During the design process I also made a few other models to get an impression of the spatial effects of certain choices.
The relationship between the graduation project, the studio topic (structuralism) and the master track (heritage)

The concept of recycling is a recurring element in all stages; the project, studio topic and master track. The master track is Heritage & Architecture. When you look up the meaning of heritage one definition is: Valued objects and qualities such as historic buildings and cultural traditions that have been passed down from previous generations.

The track focusses on the transformation of cities and buildings, which is an upcoming matter in architecture today. It is about the preservation and renewal of existing architecture. So it can be seen as the recycling of existing architecture and give it a second life with some interventions.

The studio topic is the future of Dutch Structuralism. Will structuralism be part of the future of the Dutch architecture? Structuralism focusses on Building as a city, Social interaction, Open ended and Units. The Centraal Beheer building has all of these structuralist elements. But the design also has some ‘problems’ which need to be dealt with during the design process. The open ended construction which is actually not that flexible as stated, the low construction height of 2,17 m in every unit of the building and the minimum daylight at the lower levels.

The challenge of the studio is to recycle the building and give it a new life. My graduation project is called: The machine museum, A plastic recycle experience. The function can be seen as a combination of a factory and a museum. My position for the design is to respect the current building, but to make adjustments where it improves the building. The goal of this new design and function is to give an insight in the recycling process of plastic on different levels.

Most materials used for the building are recycled or can be recycled. Think about recycled plastic façade panels in the interior and exterior, and a new steel structure which is reversible. The building itself also stands for recycling, it was in use as an office building but will be transformed for a new function instead of demolishing it.
Waste in general is a problem in the world. The world’s population is increasing and with it the consumption and waste production. In our current society plastic is often and unnecessarily used. Land and sea are affected by plastic waste, mainly because it is so durable. It isn’t just large pieces that pose a threat, however - microplastics are amassing in colossal quantities, sometimes in parts of the ocean that have never been seen by humans before. Left to itself, plastic will get infinitely smaller, but will never fully disappear.

The recycling process of plastic and other waste will play an even more important role in the future. The recycling process also has a number of obstacles. For example, recycling is relatively expensive in comparison with the production of new plastic and the more often plastic is recycled, the less quality it has.

But plastic itself is versatile, lightweight, flexible, moisture resistant, strong, and relatively inexpensive. So it can be recycled into a lot of different products.

‘Plastic is a positive thing. We just need to learn how to value it and use it appropriately.’ Quote by Marine biologist and microplastics expert Dr Lucy Woodall

As I said before the function of my graduation project can be seen as a combination of a factory and a museum. Together with additions of smaller matching functions as a restaurant, library and museum shop. In the factory the recycling process will take place and this will partly be visible for visitors, it is placed in the West quadrant and a new additional ‘super’ unit. The museum is placed in the North and South quadrant and is divided in different areas: informative, experiencing the sound, smell and movement, exhibitions of products and art out of recycled plastic and a do it yourself space where visitors can interact and make something out of recycled plastic.

Through the combination of a factory and a museum I would like to make people
more aware of the problems, difficulties but also possibilities of recycling. With the combination it will be a fun but informative experience.
The design is not only about a new function, it is about the building as well.
As I said before I want to respect the building but make adjustments where it needs improvement. The design is important for the structuralism period.
The Centraal Beheer building can be seen as an icon of structuralism, it has a typical structuralist continuous construction. The public street vs the private offices and the vertical connections through the voids. All these elements add value to the design which I want to maintain or even reinforce; Opening up the inner street by uncovering the construction. In this way the typical construction becomes visible and the inner street forms a barrier between the factory and museum quadrants. A walkway through the uncovered construction is added on the highest level to connect the 2 museum quadrants. The different functions in the quadrants together with the inner street form a small community/city in the building. Although the functions are very different they are connected in different ways.
New entrances will be added at three different levels to make the building accessible. A ‘super’ unit is added next to the West quadrant as part of the factory. It has its own construction so it would be possible to remove it and return to the current image of Centraal Beheer. The function has an influence on the use of building material and furniture (plastic).
The dilemmas I encountered in doing the research, elaborating the design and potential applications of the results in practice.

During the group analysis of the building already a dilemma arose. Our theme was: The Unit and the rules and exceptions. We found out that there are almost more exceptions then rules in the building. So we were not able to analyse all the exceptions. But the group analysis gave us a good starting point for our individual design.

My new function for the building will be a plastic recycle experience combining a factory and a museum. These functions differ a lot from each other but also from the previous office function. A very black and white view; I’ll be transforming an office building into a factory. Often you see it the other way around: an old factory transformed into an office building.

It is difficult to intertwine the museum and factory function completely, so I have chosen to separate them but make the recycle process partly visible and accessible with a guide for visitors.

The recycle process needs a lot of machines and transport, which have particular dimensions and weight. The Centraal Beheer building is very limited in its dimensions and especially in the height of the different levels. Therefore adjustments need to be made to make it possible to place some machines in the existing structure and a new hall is added for the bigger machines. This new hall is in line with the existing construction and it’s grid but it has its own (steel) construction. It is not a continuation of the standard unit but the new hall can be seen as a super unit. Since the construction of the existing building is very restricted the first phase of the recycling process will take place somewhere else and sorted plastic will be imported into the new hall.

Of course I also encountered some difficulties during the design process. Sometimes I found it hard not to lose myself in the design but keep thinking about my position in heritage and have arguments for why I made certain decisions. When I was stuck it helped to think about my starting points and why I made those decisions in the first place.

Typical for a factory is a big open space for all the machines and efficiency of the process. Centraal Beheer is exactly the opposite of this, small spaces of units (9x9) and limited height. Even for another function it is very restrictive.

A new hall is added which is a solution for the bigger machines. But if I would place all the machines only in this new hall why this function in the Centraal Beheer office building and not at a place where a big hall can be easily constructed?

My main theme is recycling in different scales. I wanted to integrate both functions, museum and factory, in the existing structure. In this way the different functions come together and intertwine in a certain way. The inner street forms the connecting element between museum and factory but at the same time it functions as a barrier. Looking back at my design I can say that a factory in a former office building, especially the Centraal Beheer office building, is definitely not the best option but it was a challenge to work on this design and make it a Machine Museum.