Ordering Substance

A Study on the Materiality of Centraal Beheer
Msc3 Heritage & Architecture
The title Ordering Substance refers to the rational approach that Hertzberger applies for the design of materialization in Centraal Beheer. A strongly organized articulation of materials appears to be the dominant principle behind the construction of the building. With his explicit component of materials, Hertzberger successfully implements his social and spatial ideas into all different layers and scales of his work. If the idea of Structuralism could be interpreted as understanding the world as different variations derived from the “constant laws of abstract culture” (Simon Blackburn, 2008), then the architect Hertzberger in Centraal Beheer building attempts to build up a physical universal structure by exploring the laws of human, substance, and architecture.
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In the Beginning
The following selected photos and texts come from our personal perception of the Centraal Beheer building, from both our own experience in the visit and the photos taken from its time in use. We try to interpret the spatial atmosphere by observing and describing the scenes and sensations brought by the various materials. The attempt of applying an intuitive and emotional perspective aims to build a connection between the overall materialization of space and personal cognitions. As an introduction to the discussions about materiality in Centraal Beheer from a professional scope, we always ask ourselves, are we, besides all the conceptions and conventions, looking at the building carefully enough?
Isolated in the urban setting by the driveway and the railway on both sides, the Centraal Beheer building finds itself in the dilemma of being in the urban context and being a city itself. The raised floors and enormous corner openings not only add up to the lightness of the volume but also suggest intentions of social involvement. Yet with its repetitive geometrical units and identical expressions, the building still looks defensively, standing quietly across the road. Heavy concrete trunks stand straight up in order to support the organic growth of a building complex, a fortress, a monument.
On the exterior, thin metal glazing frames with highly reflective glazing windows are slightly attached on to the heavy and thick concrete structure with brutal surfaces. This contrast is straightforward and abrupt. It can be read as a result of logic, a narrative that separates the supportive and supported, the bones and the skin, or an indication of the interior spatial and functional hierarchy. Hardly any greenery, flat surfaces, dark ground floor garage, heavy central placed columns, a highly rational component of orthogonal lines and blocks. Just a normal Tuesday afternoon that is no different than any other Tuesdays.

Fig. 11. Exterior of Centraal Beheer in 1972 (http://www.ajbuildingslibrary.co.uk/projects/display/id/5044)
A car is moving into the darkness. Only outlines of the concrete columns can be seen because of the distant lights and faint lights on the columns. The height of space is low, the echo of car moving can be heard clearly. Each two giant mushroom columns shape an arched space, like a cave, which flows into different directions. When a man getting out of the car, he may get lost in this maze unless walk forwards the light. The shadow on the floor is long, moving with him silently.
Giant concrete columns hold the beams, offering cars safety and shelter. Concrete became mottled with time goes by. Holes on the beams look like eyes. Everything has a sense of time. When standing on the small balcony at half a level height, the structure seems to be tangible. The concrete blocks at upper levels can be seen. The size of concrete blocks looks so small compared with the huge columns. Sky getting late, the sound of engine breaks the quiet atmosphere. A car follows the ramp going out, from concrete forest to nature.
A deep concrete canyon stretching out far front guided by the top-light and the black painted gutter. The street is occupied with pedestrians going towards all directions. The voice of their whisper seems melted into the slight hitting sound of heels hitting the floor. A man’s shadow is moving slowly behind the glass brick walls right on the opposite side. He can not notice the presence of others, he can not hear or notice the incidents down the street, we share the same sunlight and no other. Suddenly, he sat behind the desk and turned on his desk light, and there began our acquaintance.
Sitting on a corner desk, the warmness of the surface is brought by the timber work under the smooth black paint, and also by the gentle skylight coming straight from the glass rooftops. The texture of glass bricks and concrete blocks are also decorated by the filtered top-light, erasing the heaviness of the masonry construction and revealing an elegance and the warmth of their tactility.
The echo of the steps from decades ago are still hanging over the atrium. The hard rough concrete tiles are covered casually with a carpet, bathed in a gentle light from the very top of the plazas of the atrium. Material does help defining places, for walking and the places for sitting, public and semi-public. Materials also keep growing old, rotted metal works and bended timber panels, while when one looks down from the upper floors, there are still people stepping out from the darkness, with their footsteps coming even before their arrival. The building is a container in which acquaintances, contacts, discussions, events and accidents are never absent.
Lowered ceilings forces a horizontal visual expansion, and forces movement. Rhythmic light keeps coming from the top from all directions, seducing your approaching for the corners and for the unexpected. The light felt more gentle and soft on concrete when materials are less reflective and bright. Even “unfinished”, the character and potential of the space is already defined by the heavy physical skeletons and the multi-layered connections. While the “over finished” is another story, the dominant of a green plastic trash can in the middle of the path and a broken ceiling exposing the pipes of the building suggests the absent of the human, as well as the absent of a vital past.
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Fig 1.1.1 Mind map of research structure (Feng Wang, Jaa Vangvasu, Yyi Chen, 2017)
Research Background

Dutch structuralism architecture was born in the critique of functionalism and narrow rationalism in modern architecture after World War II. Elaborated firstly through the Forum magazine edited by Aldo van Eyck and his contemporaries, the emphasis on human form of urban planning was raised in order to oppose the Dutch representatives of CIAM-Rationalism. For Aldo van Eyck, “Form follows Human Needs” rather than Function.

As one of the representative personages of structuralism architecture and one of the best students of Aldo van Eyck, Hertzberger redeveloped the concept by using the deep unconscious structure in structural anthropology into architecture design. In this process, Hertzberger proposes a new theory of spatial design called “Polyvalence” which applied to his design works. This concept was introduced to define a new form principle: an interpretable, adaptable and expandable architecture. As is said by Hertzberger, “By nature Structuralism is concerned with the configuration of conditioned and polyvalent units of form (spatial, communicational, constructional or other units) at all urban scales. Only when the users have taken possession of the structures through contact, interpretation or filling-in the details, do the structures achieve their full status.” (Hertzberger, 2002)

Space was thus a combination of the constructed integrity and human involvement. The neutral character of the space shows his intentions of constructing or stimulating social interactions as well as personal interpretations.

In this process, Hertzberger also developed their unique spatial and formal language into projects with which his conceptual ideas are materialized into physical components of architecture. Just as Arnulf Lüchinger commented, “In the architecture of Herman Hertzberger Structuralist form can be found from the smallest detail up to the most complicated structure, whether it is in terms of spatial, facade or environmental design.” (AL, 2002)

Materiality is not only the methodology for constructing the project but also a design approach for implementing the social ideas into a physical object through all different scales. The definition of materiality can be interpreted as a combination of the physical properties of materials (strength, transparency, color, plasticity, thermal capacity...), the craft techniques of dealing with materials (painting, sanding, assembling) and the spatial expression methodologies (revealing, hiding).

This research intends to not only build up a connection between Hertzberger’s social proposals and the concrete realization of the physical object, but also a broader discussion about the theoretical and historical context of the design methodologies of Hertzberger in his materialization, from which a unique and specific interpretation of the structuralism buildings and an exploration about the limits of Centraal Beheer might be approached.

Research Questions

Can Structuralism ideas be built? To which extent has the materiality of Centraal Beheer realized his structuralism ideologies?

What is Herman Hertzberger’s methodology of treating materials in Centraal Beheer?

Research Framework

The first chapter of the research focuses on the background of Centraal Beheer, including the architect Herman Hertzberger, his concept about Structuralism and the involvement of the building through the years.

In the second chapter, by choosing humanism ideas as the starting point of relating building construction and fundamental ideologies of Structuralism architects, we attempt to reveal the relationship between the physical architectural language and social concepts.

A broader discussion about the materiality of Centraal Beheer included in the third chapter, by analyzing through look at the different properties of the building, we intended to provide a wider and more theoretical perspective apart from the Structuralism concepts for the understanding of the building in is materialization.

The value assessment matrix serves as a scientific and systematic summary of the building components, after which the response for the research questions and further questions regarding the materiality are explained in the final chapter.

Research Methodology

We structure our discussions in each chapter through questions, discussions, comparisons and conclusions. At the end of each chapter we try to raise new questions as a critical response to both the content and process of the debates. This framework is also applied into the overall research organization. Sketches, diagrams and collages are used among the research process to explain our own interpretation of the concepts behind the design methodology. Quotes and comments from Hertzberger and other architectural commentators are introduced to provide both supportive opinions and guidelines for our research. Also, we implement comparisons in order to reach broader debates and inspirational observations for relevant topics in the research.
Herman Hertzberger was born in Amsterdam 1932. After completing his studies at the TU Delft in 1958, he states that the reconstruction after the Second World War is functionalistic, not making good nor beautiful buildings. He adheres to a philosophy of human relations, ‘human measure and human scale’. He always tries to stimulate meetings inside his buildings, which is one of his ideas of structuralism. Hertzberger holds the view that to be effective space needs to be flexible, organic and open to interpretation, fit for purpose in an increasingly dynamic and uncertain world. Hertzberger has successfully applied his theory to a range of different building types, including houses, schools, theaters, and offices.

This research will analyze one of Hertzberger’s projects - Centraal Beheer, an office building as ‘work space’. Here, Hertzberger was given the opportunity to give concrete shape to his design ideas from the competition entries for the town halls of Valkenswaard and Amsterdam. Obviously, this is a very unusual office building. But it is a fairly typical of Hertzberger’s early work.
**EVOLVEMENT OF CENTRAL BEHEER**

Centraal Beheer evokes if not archetypes at least lightly sophisticated stylistic references - the spatial complexity of de Stijl, the plan form of Kahn’s Richardson laboratories, the sense of creating places of Van Eyck, the frankness in the use of materials of brutalism. (Duffy,1975)

*(1968-1972) Design of the building*

Centraal Beheer building is crucial in the work of Herman Herzberger. The idea, which was proposed previously in two competition projects for town halls in Valkenswaard and Amsterdam respectively, finally materialized in the Centraal Beheer. With the location at the side of the railway track, it was assumed that the station would be moved, creating an entrance zone to the inner city between Herzberger’s Centraal Beheer and the office block by Wim Dabidse being built at the same time. Ultimately however, the station remained in its original location and the entrance zone was never realized.

Centraal Beheer is built up using a repeated standard pattern, which collaborates closely with the supporting structure to fix the zoning of the interior. Meeting has been an important starting point. It is one of the first and most successful experiments with the ‘office garden’, an office for over a thousand employees got such a slightly smaller size and all corners were arranged to meet each other.

The Centraal Beheer building went into use in 1972. Since then there have been a few minor adaptations as well as several alterations and extensions of a more radical nature.

*(1995) Extension of the office building*

In the nineties, the building was expanded. For this, Herzberger also made the design. The new building firms the connection between the office building and Pakhoed building. It involved a new entrance, a deepened car and a transparent office layer, which included a conference center. The building has grown as an organism and thus remained a whole.

*(2007) Abandoned building*

In 2007, TCN Property Projects became the owner of the complex. At the beginning of the 21st century, Achmea announced its intention to leave the building. In 2013, the company’s activities moved to a location in Apeldoorn South (the Achmea Campus). The building was abandoned.

*(2013) The future of the building*

Since the insurance company Achmea left the building abandoned in 2013 it was taken over by a developer: Certitudo Capital. They have the ambition to give it a multifunctional content with an emphasis on housing, and they also want to put a special emphasis on sustainability.
II The Materialization of Structuralism in Centraal Beheer

-Urban Scale

Public Accessibility
Relationship with Context

-Building Scale

Material and Human Scale
Material and Human Behavior
Comparison with other Structuralism Buildings
How urban fabric influenced the materialization of Centraal Beheer?

In urban scale, this analysis would illustrate connection of Central Beheer office building and context both in ideal and real condition. It could determined the idea behind the design of Herman Hertzberger iconic building.
Location of Central Beheer

Centraal Beheer is the new construction building which was located on a piece of land in Apeldoorn. The owner of the insurance company, Mr. Ruiter won the land in the inner city. It is very close to downtown where all the public and commercial facilities going on. Still, this spot is situated isolated in between the wide road, Prins Willem Alexanderlaan, and the railway line until Municipal downtown extension plans announced. (Herpoel, 2013)

Looking from urban scale, Central Beheer piece of land located in the underdeveloped area. According to the map of Apeldoorn in 1960, eighty percent of buildings are residential house with a few square-meters footprint where the other twenty percent are the building with large footprint (about the same size with Central Beheer office building) for commercial and public uses, mostly located near city centre. With these conditions, Herman Hertzberger has the vision to link this building to the city centre of Apeldoorn.
Potential urban planning of Apeldoorn city centre in 1960s

During the design period of Centraal Beheer office building, the municipal plan of city centre extension was also developed. (Herpoel, 2013) This plan has attracted Herman Hertzberger attention, and it played an important role in the design of the insurance office building.

The municipality of Apeldoorn had the vision to extend the urban area to the west of original city centre with office and retail venues. All the places (original city center and downtown extension) tied together by the pedestrian pathway. An extra train station was also one of the proposal to complete this extension plan and it meant to be one of the key facilities in the extension zone. (Herpoel, 2013)

While pedestrian venue act as a backbone linking the downtown to the proposed train station, Central Beheer office building has already become part of the plan. From this urban planning, it gave Herman Hertzberger a starting point on an urban scale.

Fig 2.1.5 Diagram shows proposed downtown extension concept in 1960s
(Produced by Vangvasu, 2017)
Idea of integration

*Central Beheer & Surrounding*

From the municipal plans on the extension of Apeldoorn city center, site location of Centraal Beheer conducts this insurance office building to be part of the plan. On the other hand, this development plan also gave the position of Central Beheer office building in the surrounding context.

By becoming part of the extension plan, Herman Hertzberger thinks of the method to link his building with the proposed city center. The initial idea of Herman Hertzberger is to provide part of the building for the public. According to the wide vision and optimistic thinking of the owner of Centraal Beheer insurance company, he agreed with Herman Hertzberger’s idea on how to integrate the building into context.

The positive energy of Herman Hertzberger on new city center planning, he truly believes that this area will become a ‘hotspot’ of Apeldoorn. Centraal Beheer is a tool to create this hotspot area. To integrate his building with the proposed urban context ‘public accessibility’ become the key concept. He thinks the public should be allowed to flow into the building even Centraal Beheer is meant to be more in the private function as an office. From this point, Herman Hertzberger started to design the building from both aspects private and public function.
What methods Herman Hertzberger used to provide 'public accessibility'?

1. Master planning

To fit in proposed urban context, Herman Hertzberger continues the spine from the extension area to train station. He created the axis (space between Central Beheer office building and Pakhoed) which allow an elongate pedestrian pathway to continue. For the path over Prince Willem Alexanderlaan, it’s planned to go under the street through the tunnel for the convenient and smooth wander.

2. Function arrangement

Functions assigned to Central Beheer should correspond with the needs of the client and also the demand from the urban context. The intention of Central Beheer is to be office building to accommodate 1000 people while responding to the urban need, the public facility should also be provided. Due to the proportion of requirements and site area, zoning that intact with the backbone of extension plan will be public facilities including shopping square and street facilities.

3. Human approach

To cultivate the use of this backbone, the pedestrian way should have high quality. The buildings along pathway are determining the atmosphere and quality. In Herman Hertzberger’s view, ‘human sensation’ is very important in this sense, the height and materials should more friendly than intimidate formal feel. Building height has to correspond with the length and width of the pedestrian way. In the urban context, inside out is an important approach, suggesting public what’s going on inside, material selection have a huge influence in this mean.
How is the relationships of Centraal Beheer and context now?

Relationship with urban setting

The relationship of Centraal Beheer office building and context are different in the design stage and current situation. As lots of design element in urban scale rely on the future extension of Apeldoorn city center, once the building is completed and the municipal plans are never realized, building position is unlike.

Seeking for the relationships with context three topics are included in an urban scale; connection to surrounding; the scale of the building, building character. From the morphology map included the buildings constructed in 1900–2005,

Centraal Beheer is still located in the isolated area without any obvious connection with context. Due to the extension, the plan was terminated, the meant of Central Beheer to act like a connector between the train station and new extension zone is also not realized.

Fig 2.1.13 Morphology map of Apeldoorn in 2005
(Produced by Vangvasu,2017)
Building - in plan

From the morphology map, Central Beheer office building looks like a combination of a number of small footprint buildings instead of large footprint building. It blends in quite well with the urban context in the 1960s, since most of the building constructed before 1960 are residential typology with a few square-meters footprint. Even though the idea of combining universal unit together come from interior and human approach, Herman Hertzberger treats the external façade with the relationship with the surrounding condition.

1. Separation of module
From the core of structuralism idea, design for human, Herman Hertzberger determined 9m.x9m. the unit as competence module to accommodate various functions and interpretation by users.

2. Building envelope
To combine all the competences together, building shell was created to facilitated other amenities as public facilities, circulation, and services.

3. Subdivide building envelope
To make building envelope correspond to the interior space, the shell is also subdivided into equal size in the same manner as an inner unit.

4. Separation of building envelope
The envelopes with the solid roof are clearly separate from each other where glass roof infilled the gabs. This allows natural light to shine into the building while creating the corresponded footprint size with surrounding buildings.

Outside in
By separating building envelope, the building becomes porous and allows interior space to connect with outside environment.

Fig 2.1.14 Diagram illustrate building envelope design method
(Produced by Vangvasu, 2017)
Building height

In the current situation, Central Beheer office building merges well with the surrounding in building height. The design method of Herman Hertzberger on this insurance office make the building look harmony in height with both the building constructed before and after 1960. Most of the building built before 1960 are one-story to three-story height while the building built in modern time are mostly four-story to seven-story height.

Fig 2.1.15 Centraal Beheer building height in relation with surrounding buildings
(Produced by Vangvasu, 2017)

Fig 2.1.16 Plan illustrate building height
(Produced by Vangvasu, 2017)
Building- in elevation

In the 1960s, the time of designing Central Beheer office building, most of the building are one-story to three-story height. As the function of Central Beheer is an office building, multi-story is necessary to accommodate various facilities. To blend multi-story building with relatively low rise context, Herman Hertzberger designs the building with the following approach:

1. Building Volume
Comparing surrounding buildings height to the volume of Central Beheer office building (volume accommodated all facilities)

2. Down scale
To reduce the scale of the massive building, Herman Hertzberger extrude and compress the envelope of the different module.

3. Variety in height
Different height of module makes the better association of Central Beheer and context dialogue as the scale become more friendly.

4. Relationship with context
The gradient of building height from lowest (one-story) at the edge to highest (five-story) in the middle. By doing this, the massive building has a smooth connection with surroundings.
Building character

The illustration below shows a classification of the urban development in Apeldoorn. The ones highlighted in red and orange are the buildings constructed before the completion of Central Beheer. The others are the properties developed after Herman Hertzburger’s building.

Referring to the diagram, the majority of the red buildings are residential developments. These development appearances help indicate the original atmosphere and urban context adjacent to the site. An analysis of these developments materialization will be examined in details in the following pages. The information helps identify if an urban material palette was one of the important aspects that influenced the initial design stage of Central Beheer during the 1970s.
Fig 2.1.19  Surrounding buildings of Centraal Beheer

1929: residential
1982: office
1985: residential
1990: retail
1985: residential, retail, office

(Photo from Google map, 2017)
According to the photographs of the buildings constructed before the establishment of Central Beheer, the common materials of these developments are brick masonry walls and natural color of the concrete surface. Most of the buildings were constructed with pitch roof in clay tiles.

The following are the illustrations of Apeldoorn materialization and color scheme before the 70s.

### 1. BRICK
1.1 Exposed brick masonry wall
1.2 Painted brick masonry wall

### 2. OPENING
2.1 Timber frame window
2.2 Single / double glazed infilled

### 3. CONCRETE

### 4. CONCRETE BLOCK
4.1 Painted concrete block on external facade as structure and non-structure solid wall

### 5. OPENING
2.1 Aluminium frame window
2.2 Single / double glazed infilled

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**Fig 2.1.20** Images show facade of surrounding buildings constructed before Centraal Beheer office building (Photo from Google map, 2017)
Building materials
Centraal Beheer office building

In the development of Central Beheer, concrete was introduced as the main building material of this office complex. The concrete elements were originally on exposed surfaces. The structures were in the fair face-smooth surface. External masonry walls were constructed in raft concrete blocks. However, this original intention of material composition has been altered through the off-white painted finished. Another significant material is the curtain wall in purple coated aluminum framing.

1. CONCRETE
   1.1 Prefabricated concrete structure
   1.2 Fair-faced concrete structure

2. CONCRETE BLOCK
   2.1 Exposed concrete block on external facade (original)
   2.2 Painted concrete block on external facade (later alteration)

3. OPENING
   3.1 Painted aluminium window frames
   3.2 Single glazed infilled

4. CHS steel
   4.1 Circular hollow section steel railing on roof terrace.
What construction techniques make Central Beheer outstanding from context?

1 Exposed structure

The exposed reinforced concrete structures of Centraal Beheer has given a unique appearance to this complex. Two concrete columns with concrete brick infill are positioned at the center of each module. This composition reflects the internal usages housed in these units. The four opened corners provide natural light and view for the functional spaces.

2 Aluminium framed glazing window

Herman Herztberger used these curtain wall details to reduce the visible thickness of the concrete structures. These tectonic gives a sharp and clear-cut appearance to this building. The detail designs and development of this construction technique will be shown on the next page.
3 Skylight & integrated gutters

The major advantages of the skylight and exposed gutters above the inner street of Centraal Beheer are to allow natural light to penetrate inside the building and to provide the practical need for water drainages. The use of different materials gives a clear distinction between functions inside. From urban scale, this composition of the transparent roof for inner street and solid roof for universal unit help to down scale the massive building.

4 Steel railing

At the top termination of this building, the composition of the concrete parapet wall and circular hollow sections steel tube offer a lighter look for this building.
Glazing facade & skylight

Details

These two details have a huge influence on Centraal Beheer office building. For the quality of internal spaces as working office, both glazing window and transparent roof have provided natural light in this massive building. One of the construction techniques that impact the character of Centraal Beheer is the glazing façade, it gives a sharp and light appearance to this building.

Although these large windows create a modern look and good quality of light in Centraal Beheer, there are also negative effects to concern. The two main problems are direct sunlight in working areas and high energy consumption for the temperature controller. The details of curtain wall show the solution of Herman Hertzberger on these aspects. He integrated sun shading device with aluminum frame of glazing windows. For the heat loss problem, he placed heat exchanger device in between glazing window and working space. Herman Hertzberger solutions have compromised the negative effects of these glazing systems in order to retain the positive capability of large window surface.
Fig 2.1.32 Detail 1 - Aluminum frame details
(Scanned from HNI archive, Centraal Beheer, 2017)

Fig 2.1.33 Detail 2 - Skylight details
(Scanned from HNI archive, Centraal Beheer, 2017)
Fig 2.1.34 Model of Amsterdam town hall
(Retrieved from Heuvel, 1992)

Fig 2.1.35 Model of Valkenswaard Town hall
(Retrieved from Heuvel, 1992)
In urban scale, this analysis illustrates three influences of Apeldoorn urban fabric on the design of Centraal Beheer office building. The three dominants are included the extension plan of Apeldoorn city center, size and grain of Apeldoorn city, and texture of surrounding buildings.

As the proposed town extension plan of Apeldoorn was developed during the same time as this insurance office building, it had a huge influence on the design of Herman Hertzberger. (Herpoel, 2013) From the municipal plan, Centraal Beheer plot of land was located in a prime area, connecting proposed additional train station and the extension area. Herman Hertzberger method to link this building with the proposed plan was to integrate public in the building. From this starting point, he tried to apply the various method to provide public accessibility. From the analysis, the method that he used is similar to how Herman Hertzberger designed for Amsterdam Town hall in 1967. He created an axis corresponded to context structures for the public pedestrian venue. Yet, he assigned function suitable for the public where the public intact areas are located. (Heuvel, 1992) These ideas result as the main pedestrian street in between Centraal Beheer and Pakhoed building, and the design and function of the west wing.

Herman Hertzberger always emphasizes that his buildings are designed for the human. For Centraal Beheer and his previous works; the design of Valkenswaard town hall and Amsterdam town hall, present clearly where are the main concern of Herman Hertzberger.

‘the town hall has to be essentially anti-monumental in the sense that monumentality is connected to power. The town hall has to be essentially monumental in the sense that monumentality is connected to democracy’

— Herman Hertzberger implied in the design of Valkenswaard (Heuvel, 1992)

Even though universal unit might be the starting point of this structuralism architecture, for the complex design, the analysis shows that Herman Hertzberger design of plan and elevation coincide with the size and grain of the city.

Comparing the appearance of Centraal Beheer and other buildings in Apeldoorn back in 1970, we can see that Centraal Beheer character was totally different. It looked more open and lighter. The analysis presents that Herman Hertzberger used modern construction technique during that time to enhance his idea on the creation of the architecture for the human. Glazing façade maximized daylight and view for people working inside, skylight helped to improve quality of interior spaces in this massive building. In addition, Herman Hertzberger’s material selection helped to down scale the size of Centraal Beheer to blend in with the context of Apeldoorn. On the other hand, Centraal Beheer façade would not be so outstanding if the extension town plan is realized.

![Fig 2.1.36 Sketches illustrate conditions of Centraal Beheer and surrounding buildings in 1970s](Produced by Vangvalsu, 2017)
II The Materialization of Structuralism in Centraal Beheer

-Urban Scale
  Public Accessibility
  Relationship with Context

-Building Scale
  Material and Human Scale
  Material and Human Behavior
  Comparison with other Structuralism Buildings
How does materiality meet the human needs in Centraal Beheer?

The Centraal Beheer building was conceived as a spatial organization expressing the need for humanization. In building scale, the relationship between material and human are explored in two directions: human scale and human behavior. The analysis is carried out through deep and detailed discussions about different properties of the material that has influences on human activities.
Structuralism idea is against modern society concept; the hierarchy system which limited personal initiative. Herman Hertzberger believed that ‘individual user is equally important’. (the architect’s journal, 1975) He valued the uses as his co-designer. As the main architect, he created two frameworks; the first framework is the basic elements including support systems and overall design composition; the second framework is the competence for the uses to complete with their own personality and taste. (Lüchinger, 1987) With this competence and performance concept, Herman Hertzberger created a sense of belonging to all users and produced the architecture for the human.

Fig 2.2.2 Conceptual diagram of Competence and Performance
(Produced by Vangvasu, 2017)
**Framework**

**Exterior** - Most of the framework for external façade is the basic element and unalterable. It composed of an architecture form, skin composition, and materials which have a direct impact in defining the character of Centraal Beheer in Apeldoorn. Herman Hertzberger believed that under the variety of performance, there should be elements that tied those interpretations together. By this idea, the external look of Centraal Beheer has always stood as it is since 1970. (Lüchinger, 1987) Still, he provided some competence on the exterior, like roof terraces.

**Interior** - ‘the emphasis of Centraal Beheer is more in the internal space than the exterior’ Herman Hertzberger stated during the lecture of Centraal Beheer. The basic frameworks for the interior are structure and service systems. For the interior, Herman Hertzberger designed lots of competence which provided for user performances. He applied many design methods to create these competences, he thought of how to create an appropriate space for human, how to define an appropriate division, how to select material for polyvalent space.

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*Fig 2.2.3 Conceptual diagram shows frameworks by architect (Produced by Vangvasu, 2017)*
MATERIAL AND HUMAN SCALE

How did Herman Hertzberger design 'Polyvalent space'?

Appropriate space

Herman Hertzberger emphasized on creating an architecture for human in Centraal Beheer office building. (Heuvel, 1992) He used human as a focal point to design dimension, composition and the atmosphere. The result of understanding human behavior, he created appropriate spaces for 1000 working peoples in Centraal Beheer insurance office. (Luchinher, 1987) This analysis interpretive Herman Hertzberger idea on creating appropriate space through the design as follows:

1. Empty floor plate
A large and empty platform without any framework creates an intimidating space for the users.

2. Space division
By dividing space into human scale, it creates a better space for human as the dimension is more relevant to human.

3. Separation of module
By separating space apart from each other, it creates a sense of belonging to the users.

4. Working corner
Guiding on function zones make the user understand clearly which space is belonging to them.

5. Competence of space
Performance occurs variously in the provided area.

Fig 2.2.4 Diagram illustrate approach to create appropriate space (Produced by Vangvasu, 2017)
Universal unit

After defining spaces for different functions, a suitable dimension for the human has a huge influence on the creation of an appropriate space. The sizes should correspond to the different function. From one of the requirements by Centraal Beheer insurance office to create flexibility of space (Luchinher, 1987) together with the idea of structuralism to design polyvalent space, Herman Hertzberger came up with 9meters x 9meters unit size. The size came from the overlapping of social distance between different function in the office context.

"The most universal unit derives from an "anthropological" response to the programme. Focus is put on what is shared and timeless."
Herman Hertzberger

The design of the unit shows a division of space by the integration of spatial and technical considerations. Different heights and ceiling treatments are applied to enhance the spatial hierarchy. The composition of dimensions showed slight differences in varied areas and functions.

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**Fig 2.2.5 Social distance diagram** (Produced by Feng Wang, 2017)

**Fig 2.2.6 Unit dimension** (Produced by Feng Wang, 2017)
Space interpretation

The universal units composed of four 3meters x 3 meters function corners. These spaces allow for various interpretation; working corner, coffee corner. For the working area, each corner is suitable for maximum 4 people which different arrangement of furniture layout leads to different atmosphere. By joining two working corners, it creates bigger space for gathering. The height of partition gives different level of privacy to space.

Fig 2.2.7 Diagram illustrate function variations  
(Retrieved from Luchinger, 1987)

Fig 2.2.8 Conceptual section shows the combination of space interpretation  
(Produced by Vangvasu, 2017)
How structuralism ideas shape structure of Central Beheer?

Prefabrication structure

Resulted from the creation of a universal unit for flexibility of space interpretation, skeleton of each unit was also designed in the same manner, structure unit for each module. The prefabricated concrete structure was chosen to be a support system as it is suitable and cheap construction technique for these repetition modules. Furthermore, this structure system also represents the idea of structuralism, anti-hierarchy. Every structure module has the same size even though it is not necessary for the load carried behavior.

Main Cantilever beam height/span 1/3
Sub Cantilever beam height/span 1/6

The dimension of the unit started with the consideration of an appropriate social distance with which comfortable communication could be stimulated. Besides, the scale of each unit also take into account the variations of offering working space of 2 or 3 people. Lastly, the cantilever beams have restrictions of spanning in regard to the pre-fab concrete structure system. The final scale of the unit can be regarded as a combination of technical, social and functional intentions.
Structure systems

The structure has a big impact in providing different size of the space. According to functions and design of Centraal Beheer office building, there are two spaces that require different size; office space and parking space. The office spaces are subdivided into small working corners, frequent gridline of the structure is not a problem, while parking lots require much bigger space for the vehicles traffic. For the repetition of the universal module, Herman Hertzberger selected prefabricated structure as it is faster, cheaper and more logical than using cast in-situation structure. For parking space, cast in-situation structure is chosen.
Structure gridlines

GRIDLINE1: Prefabricated structure

There are two types of prefabricated structure module, corner unit, and intermediate unit. An intermediate structure type tied two spatial universal units together with the main beam, 9 meters span. As the main beam connect two spatial units, gridline of structure unit and spatial unit are shifted which create the channel in the middle of the spatial unit. This gap in the middle allowed for all the service pipes.

GRIDLINE2: Cast in-stu structure

To create bigger space for parking space, new structure gridline was introduced. ‘Mushroom column’ is combining four prefabricated columns of gridline1 together. (Luchinher, 1987) With this structure behavior, it created the appropriate size of parking lots.
MATERIAL AND HUMAN SCALE

Construction process

1 Prefabricated column
connect these columns to the foundation

2 Main beam
place the main beams on columns
(3 meters span, 9 meters span)

3 Secondary beam
place secondary beams on top of the main beams. These beams cantilever out to support the four working corners.

4 Prefabricated floor plate
four corners of working space are placed with prefabricated concrete slabs.

5 Cast in-situ concrete
pour concrete in-situation at the traffic area to complete the unit floor plate.

6 Next level construction
after the completion of a unit platform the construction repeated in the next level.

Fig 2.2.20 Diagrams show construction process of prefabricated structure
In Centraal Beheer office building, Herman Hertzberger wanted to expose most of the elements as much as possible, the elements are including structures, materials and technical systems. (AHH architect, 1972) The composition of construction details is notable in this office building. At every corner of the universal unit, there is cast-in-place concrete joint connecting two beams together. This kind of details is the intention of Herman Hertzberger to distinguish Centraal Beheer from other buildings. (AHH architect, 1972) The unfinished look of Centraal Beheer is fulfilling with these construction details.

Fig 2.2.21 Images of prefabricated structure details
(Photo by Feng Wang, 2017)

Fig 2.2.22 Construction detail of prefabricated concrete structure
(Scanned from HNI archive: Centraal Beheer, 2017)
MATERIAL AND HUMAN INTERACTION

Appropriate division

According to the requirement of The head office of Centraal Beheer to design 'A work space for 1000 people, working 8 hours a day, 5 days a week, Herman Hertzberger came up with the idea of creating office as a 'home'. (Lüchinger, 1987) Other than the intention to design high quality working space, Herman Hertzberger also put his emphasis on social interaction space.

The right amount of public and private space is introduced in Centraal Beheer office building. From our interpretation, Herman Hertzberger used following methods to create an appropriate social interaction space.

1. Empty floor plate
Large space without hierarchy or indication of function.

2. Create differentiation
The use of different methods and materials to indicate the use of space (private or public).

3. Indication of working space
As Central Beheer was an office building, Herman Hertzberger first started to design appropriate space for working. The gap in between those private function is public zone.

4. Implement in building scale
The same method for creation of public space is also introduced in building scale. The gaps in-between module form public space for the complex.

5. Introduction of inner street
The negative space in between stacks of module become the inner street of Central Beheer where most social interaction occurred.

Fig 2.2.23 Diagram illustrate an approach to create appropriate division
(Produced by Vangvasu, 2017)
Social life

In the book Life between buildings by Jan Gehl, human behaviors were analyzed. People like to sit near the window in the restaurant or cafe where they can see outside, seats always face the street, children like to play near the crowd. Social interaction is a significant part daily life of the human. People like to gather together for relax and communicate instead of being isolated.

Hertzberger designed the building based on human behaviors. He regarded social interaction as a crucial factor in his building. In Centraal Beheer, people can work facing the public. By making everybody see each other, everyone knows who works there.

Besides, Hertzberger wants to have traffic spaces that have a positive atmosphere so people can stop and chat. So we can see seatings in the traffic space in his buildings.

Shopping arcades

Hertzberger mentioned the glass-roofed shopping street in his book, which can be regarded as a prototype in Centraal Beheer building. Because of the arcade, inside and outside are so strongly connected to each other that people cannot tell whether they are inside the building or in the space connecting two separate buildings.

In Centraal Beheer, the concept of the arcade was used to erase the borderline between public and private. The office building became more publicly accessible.
"What spatial language did Hertzberger use to stimulate human interaction?"

“We would like to build a big shopping street in this building with the same feeling of freedom as a real street... the freedom to come in off the street to have a cup of coffee but also to wander around and visit other places.”

Herman Hertzberger (1932- )

Inner street idea
People are central to Dutch structuralism, with the emphasis on a mutual encounter. Hertzberger regarded in-between space as a very important factor in his building. Three-meter-wide voids between units under skylights invite people to sit down for a chat or to look at the activities of others. In the central area are sitting areas, coffee bars, and conference rooms. Mother with her children may walk in to meet father; they may have a drink together or, as many families do, lunch together in the restaurant. All materials used by the architect is for creating the open atmosphere of the inner street. The corners of the units seem like “balconies” which make it possible to withdraw into a sheltered corner or look for contact with the neighbors thorough a conversation over the parapet. In this building, working is not working, users are able to have more time for leisure. This openness is intended to break down conventional barriers between work and home, public and private, building and street.
'How did Hertzberger create an inner street with materials?'

“For me the materials are not just a matter of aesthetics but must support the idea. A sense of aesthetics will be of second nature to you but that’s very personal, very difficult to talk about.”

Herman Hertzberger (1932- )

Use of Concrete

Concrete skeleton
The concrete skeleton of the buildings is visible. The structure of building becomes readable. “It is the fundamental unfinishedness of the building, the greyess the naked concrete... that are meant to stimulate the occupants to add their own color.”

Concrete blocks
The concrete blocks are cheap materials. Hertzberger created inner streets by using the same concrete blocks both inside and outside. The rough surface erases the borderline between inside and outside. The color of concrete blocks is warm when diffusing the light.

Concrete tiles
Hertzberger left the floor unfurnished to the users. The inner streets are covered with concrete tiles. The concrete tiles became mottled with time goes by which were of outdoors qualities. In this way, the inner streets become a piece of the city with spatial continuity from outside to inside.
The early office
The early office buildings were generally built around the unit of small offices. Such offices not only answered a real need but were attractive to the clients commissioning the buildings, as they could charge a higher rate per square foot for smaller tenants. In the early years, typical offices were formal anti-social with strict social hierarchy. At that time, functionalism was the architectural trend. The working space in the offices was open-plan space with desks back to back.

Re-define the office
Shortly after World War II, new concepts and ideas were introduced by structuralist architects. The types of working space changed too. In Centraal Beheer, the office building is not an isolated building anymore. Hertzberger’s Centraal Beheer building raises questions between architecture and the program of the office. Hertzberger clearly demonstrated the changing attitudes towards skilled office workers and combined work with life, offering a place where users can spend most of their time in this building. Working areas were divided, and users can have their own decorations according to their own tastes.
Working areas are articulated in units that a group or individual can establish a personal identity. For different requirements of working space, some working areas have glass block walls at their outer boundaries, some are opened with additional wood parapet. The open relationship between floors is intended to create a feeling of belonging.
Glass bricks

Glass bricks are often used by architects to create walls with varying light effects, which provide visual obscuration while admitting light. Hertzberger also considered about the privacy that he doesn’t want common space to interfere with the working areas of the building, so he used the glass bricks for partition which are also a kind of soundproof modular material. The transparency and lightness of glass bricks create a harmonious contrast with the heavily dimensioned main structure of the building.

Meanwhile, the glass bricks are transparent at sitting height. Users can look through the transparent bricks instead of being isolated.

Window strips were installed between glass bricks and concrete columns. People can look outside when standing near the window. Assorted glass materials give varying levels of translucency to the facade of semi-public working space.

Semi-public working space
Public working space

Wood partition
When the corner of units is opened, wood partition painted black was added. Hertzberger wanted to keep the neutral quality of space and outside atmosphere, so he painted wood instead of using original color. Maybe it is because that color of the wood will give people feeling of the interior. In his another school project - Apollo school, he also used the concrete blocks combined with wood. But he left the wood in original color for creating comfortable interior atmosphere.

Why didn’t he choose metal or stone as addition elements? Because the partition is also used for multi-functions like working desk. Compared with stone or metal, wood makes people feel warm when touching it.

At the corner of wood partition, translucent glass is installed to emphasize the openness of the corner in a more detailed way. Also, users can see through glass but not clear. The thin wood panel covers the concrete blocks, which is a harmonious way of combining concrete blocks and wood.
MATERIAL AND HUMAN INTERACTION

Interaction with outside

Glass windows & aluminum frame

Hertzberger remarks on the openness of the corner - “When the large window opens across the corner, the world opens; a spatial experience of a completely novel dimension.” It is the same idea as the openness of the corner inside. People working at the corner areas will see each other through the big window. They can also have interaction with outside world.
Traffic space
Wood doors with glass

The doors are painted in black and there are signs for directions on the lintel of the doors. Different territories are divided by this element. People can look through the glass panes on the door before they enter another area.

Doors with glass between two equally public and therefore equally accessible spaces provide ample visibility on both sides so that collisions can easily be avoided on a strictly equal basis. Doors without transparent panels will have to give access to more private, less accessible space. When such a code is consistently adopted throughout a building it will be understood rationally or intuitively by all the users of the premises and can thus contribute to clarifying the concepts underlying the organization of accessibility (Hertzberger, 1991).

“When, in designing each space and each segment, you are aware of relevant degree of territorial claim and the concomitant forms of accessibility with respect to the adjoining space, then you can express these differences in the articulation of the form, material, light and color, and thereby introduce a certain ordering in the design as a whole.”

Herman Hertzberger (1932- )

Fig 2.2.54 View of doors
(Lessons for student in architecture, Herman Hertzberger, p19)
MATERIAL AND HUMAN INTERACTION

Traffic space

The original staircase
In the original plan, there were four stairwells made of concrete without any decorations. Glass windows are installed around the corner. A triangle sitting area in concrete was designed which is elaborated by the architect. Hertzberger considered traffic space not only for transportation but also for interaction. He used wood in original color for the handrail, which is a warm and tangible element in this building.

Additional spiral staircase
For more convenient traffic, an additional steel staircase was added in later adaptation. Different from other spiral staircases, Hertzberger designed concrete cylinders as bases of the steel columns. The height of cylinders is for people sitting. This became a language for Hertzberger which was also used in his later projects, like Apollo school.
Concrete is the main material in this building. The continuity of the materials from outside to inside is a strong performance of inner-street idea. When different types of concrete were put together, the naked, rough space is approachable. People can feel inner-street atmosphere when they enter. However, the acoustics was not that good because of the hard materials. The working areas on “balconies” were also noisy like public space.

Glass bricks were used in varying levels of translucency, which were enough to keep privacy and translucent enough to let in light. Compared with concrete materials, glass bricks are lighter.

Wood was painted in the black and translucent glass was installed in the middle. Different layers of materials give the feeling of actuality and illusion.

Single glazing windows at the corner offer a wide angle of view and let more light come in. The aluminum frame was painted in purple but turned into pink because of peeling of paint. Meanwhile, large windows lead to insulation problem.

Oak floor is in warm and bright color. Hertzberger used it mainly in common area like the restaurant. This material is in striking contrast to other unfinished materials.

<table>
<thead>
<tr>
<th>Materials</th>
<th>Color &amp; Texture</th>
<th>Competence</th>
<th>Character</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td></td>
<td>Structure</td>
<td>unfinished</td>
<td>Concrete is the main material in this building. The continuity of the materials from outside to inside is a strong performance of inner-street idea. When different types of concrete were put together, the naked, rough space is approachable. People can feel inner-street atmosphere when they enter. However, the acoustics was not that good because of the hard materials. The working areas on “balconies” were also noisy like public space.</td>
</tr>
<tr>
<td>Concrete block</td>
<td></td>
<td>Skin &amp; Surface</td>
<td>rough, heavy</td>
<td></td>
</tr>
<tr>
<td>Concrete tile</td>
<td></td>
<td>Floor</td>
<td>unfinished, mottled</td>
<td></td>
</tr>
<tr>
<td>Glass brick</td>
<td></td>
<td>Surface</td>
<td>transparent translucent</td>
<td>Glass bricks were used in varying levels of translucency, which were enough to keep privacy and translucent enough to let in light. Compared with concrete materials, glass bricks are lighter.</td>
</tr>
<tr>
<td>Wood partition</td>
<td></td>
<td>Surface</td>
<td>neutral</td>
<td>Wood was painted in the black and translucent glass was installed in the middle. Different layers of materials give the feeling of actuality and illusion.</td>
</tr>
<tr>
<td>Glass window</td>
<td></td>
<td>Skin</td>
<td>transparent</td>
<td></td>
</tr>
<tr>
<td>Timber floor</td>
<td></td>
<td>Floor</td>
<td>warm</td>
<td></td>
</tr>
</tbody>
</table>
MATERIAL AND HUMAN PARTICIPATION

How did Hertzberger by materiality create an interior space that encourages user-intervention?

“The character of such an area will depend to a large extent on who determines the furnishing and decoration of the space, who is in charge, who takes care of it and who is or feels responsible for it. ... The form of the space itself must have the competence to offer such opportunities, including the ability to accommodate basic fixtures, fittings, etc., and allow the users to fill in the spaces according to their personal needs and desires.” (Luchinger, 1987)

Interactive Competence Elements
- provision of furniture in an appropriate amount

Unfinished Materials
- Herman Hertzberger claimed that her use unfinished materials to invite user involvement
In each office unit there are surfaces upon which users can do their intervention on. These surfaces are of different materials and textures, while they all appear to be plain and neutral. In scale they are also organized to offer different heights for varied activities. Users under this circumstance are encouraged to occupy the surfaces based on their own preferences and characters.
Interpretation of spaces

The workers of Centraal expressed high enthusiasm in decorating both the common streets and their own areas. Due to the rough surface and the hard grayish colors, lots of colorful posters and soft decoration elements are brought into all surfaces of the space. They did not only help to create a more vivid atmosphere but also improves the acoustic environment of the building.
A symbolic geometrical language

The use of two round shaped ventilation openings on the concrete acts as an stimulation for decorations and interpretations, apart from their functional influences on the space. Different decorations and posters are attached to the surface. The shape of the openings are deliberately designed as a symbolic form as people relate these shapes with the similar shape of eyes.
The craftsmanship in the building structure was more important than the envelope for van Stigt. At the same time what sets van Stigt apart from other structuralist architects is that for him the façade is inseparable from the building. He knew that the façade often receives the most attention when the building is rated and that the façade sells well. This is seen in his choice to use a more expensive material for the façade, limestone.

The raw basement of washout out aggregate concrete, the façade of limestone the bronze window frames, exposed aggregate concrete floors in the interior: these are elements that give a welcoming atmosphere as a house for the citizen.

The load-bearing system in Raadhuis Ter Aar is different from Centraal Beheer. Use of laminated timber is dominantly present in the work of J. van Stigt. Especially in the roof form but also in his furniture, like staircases are also timber in dark red color. Every square module is closed by a cross roof. The beam construction of the redwood cantilevers 2,5m past the façade which can be seen from outside.

Compared with concrete blocks in Centraal Beheer, limestone is more aesthetic and smooth, which gives the atrium warm and finished quality.

The washed concrete is used in the basement, floor, and reinforced structure. For van Stigt, he preferred to create an interior atmosphere which is not so rough so he didn’t use too much concrete.

**RAADHUIS TER AAR**
Construction Year: 1970
Alteration Year: 1992
Current Function: Municipal office
Architect: Joop van Stigt

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**Similarities:**
Both in Raadhuis Ter Aar and Centraal Beheer, materials are honest and constructions are visible. Hertzberger and van Stigt gave special attention to transition between outside and inside. Materials they used to show the continuity.

**Differences:**
For Hertzberger, aesthetic is a personal matter. So materials should be used to support idea instead of being beautiful only. However, for van Stigt, he really cares about the good look of a building. Thus, the interior of Raadhuis Ter Aar is more exquisite.
The orphanage is simply style-less. The limited palate of materials (concrete, glass, brick and render) suggest a minimalist approach. Columns sit on a concrete plinth, windows abut columns. Bits of reflective materials or colored tile are scattered about in a decorative motif, but one that feels more like a folk tradition than an architect’s polished aesthetic. All materials used by van Eyck are simple. When we start to realize the simplicity of the materials used to achieve the atmosphere of space, it feels like a real achievement. To be clear, the domesticity, everydayness, un-heroic materiality and detailing are never cheap. The tactility of space, which is related to materials directly, that makes this place what it is.

The restricted palate of materials was allied with a straightforward structural system. Concrete columns support concrete beams, which support one of two differently sized concrete domes. The domes are either solid or punctured with circular openings.

The spaces between the columns are filled in with brick, transparent glass, or glass blocks. Generally, the brick is plastered always in 'rooms' or left bare in circulation areas. The floor is either carpeted always in 'rooms' or paved in stone circulation areas.

One of the more beautiful details is the frosted glass inserted in the concrete beams. These glowed, even in overcast weather. This detail makes the building lighter in two ways – the glowing light magnify the general sense of visible light while it also makes the joint where the wall and roof met less solid and hence make the roof appear to float and seem lighter (Henri Ciriani).

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Comparison with Hertzberger’s other project

De Overloop building was designed later than Centraal Beheer. Many progress can be seen in this project. In De Overloop, the concrete structural components are subtle. Only parts of them are exposed. On the corridor side, using the exposed beams, the facade emphasizes the horizontal lines to show the continuous corridor. On the unit side, beams are partly exposed to show the division of rooms. In Centraal Beheer, the concrete structure of the buildings is totally exposed. Moreover, compared to the Centraal Beheer, the size of the brick became smaller. Also, the new concrete brick is better in maintaining clean. Concrete is the main material in both buildings, but De Overloop doesn’t look as heavy as Centraal Beheer. For different types of users and life styles, Hertzberger made some differences in size of materials and the way of combining concrete and concrete block.

DE OVERLOOP
Construction Year: 1980 - 1984
Current Function: Elderly Housing

Fig 2.3.11 Exterior view
(Photo by Xiaokang Liu, 2017)

Fig 2.3.12 Structure in interior in De Overloop
(Produced by Xiaokang Liu, 2017)

Fig 2.3.13 Structure in interior in Centraal Beheer
(Produced by Yiyi Chen, 2017)

Fig 2.3.14 Structure on exterior in De Overloop
(Produced by Xiaokang Liu, 2017)

Fig 2.3.15 Structure on exterior in Centraal Beheer
(Produced by Yiyi Chen, 2017)

Fig 2.3.16 Concrete blocks in De Overloop
(Photo by Xiaokang Liu, 2017)

Fig 2.3.17 Concrete blocks in Centraal Beheer
(Photo by Yiyi Chen, 2017)
The concern for human was never absent in the design language of Hertzberger, it was also one of the main critics and principles of Structuralism architecture. As one of the major topics of the after-war reconstruction process in Dutch architecture, humanism was a significant concept raised by Aldo van Eyck and Herman Hertzberger. The intentions to build for human can be understood in all different dimensions and scales of the architectural language of Hertzberger.

In Centraal Beheer the consideration for human was evident in all aspects. Firstly the consideration about human scale was introduced for designing the dimensions of each structural unit. It was through the balance between an appropriate social distances of human interaction and the limitations of the concrete material that he finalized the exact size of the components. The size of the unit also offers abundant possibilities for different functions within the units, which enables the flexibility in the usage of the space. A proper scale of a unit has the potential of creating a sense of privacy and belonging so that people feels comfortable working and occupying that space. It was also a proper dimension for constructing the skeletons of the building by its pre-fabricated concrete components.

Secondly, the concept of creating an inner street was realized with the different treatment of materials. Making people feel that they are outside encourages their willing of communicating with others. Also, with the composition of materials, Hertzberger created within the building varied layers of sphere for human interaction. They share the public atrium with top-light but also have their own place for working. At the same time, materials with different transparency was introduced for multi-layered visual connections and communications. They together create an public but also multi-layers space quality that enables everyone to inhabit in a certain community but also have the freedom of defining their own position within the community.

Thirdly, materiality also helps stimulating human intervention about the space and thus acquire the true identity and abundancy inside the built environment. With the brutal surfaces and proper amount of physical architectural components, Hertzberger attempts to create a space that seems neutual to its users and encourages them to communicate with the building itself by defining their own place. It was a crucial part of the idea about creating polyvalent space in which a balanced relationship between the building and its users are constructed.

The comparisons with other Structuralism buildings present to us a wider understanding of the building in the context. Different sizes and materials of the same building component also elaborate distinct design methodologies of the architects.

The connection between material and Structuralism ideas to some extent are constructed through the emphasis on human scales and behaviors. But within this connection there are also restrictions and boundries. Identical structural units provide not only possibilities but also restrictions in regards of function and creation. The equality of space also makes the users lose their sense of orientation within the built environment, which makes it difficult to locate of indentify themselves within the built environment. The intentions of creating street space also create functional obstacles such as acoustic problems in an office building.
III The Expression of Material in Central Beheer

“Centraal Beheer evokes if not archetypes at least highly sophisticated stylistic references- the scale and texture of the Mediterranean village street, the spatial complexity of de stijl the plan form of Kahn’s Rhchadson laboratories, the sense of creating places of van Eyck, the frankness in the use of materials of Brutalism.” (AJ, 1975)
What is Herman Hertzberger’s methodology in the materialization of Centraal Beheer?

By discussing the different dimensions regarding materiality in Centraal Beheer, we intend to explore the design philosophy of Hertzberger in his treatment of materials. Moreover, from the perspective of materiality, a broader discussion about the origins and references (De stijl, Berlage, Louis.I.Kahn, Aldo van Eyck) of Hertzberger will be included based on his theories and practices.

Chapter to be Continued...
IV Value Assessment

Urban Scale
Building Scale
Technology Scale
How do we value the Centraal Beheer building through all scales?

The following chapter elaborates the assessment of values in all scales based on our research on the material of Centraal Beheer. The discussion about different values of the building represents our opinion of the existing elements of the building. By including both the potentials and challenges in the assessment we intend to elaborate the complexities of the current building in a systematic and scientific approach.
Cultural Value Mapping - urban scale

**Setting:** Historical, composition

- The street between Centraal Beheer and Pakhoed is the main axis which corresponded to the proposed town extension plan
- Composition of Centraal Beheer – pedestrian venue – Pakhoed
- The main axis has no function since the town extension is never realized

**Site:** Composition, use

+ Building mass composed of 4 function wings and public venue in the middle follow diagonal axis.
+ Public assess through the centre core.
+ The different function and design of the East wing since in attached to the pedestrian street in the municipal plan. For the actual condition, this section is the connecting wing to the adjacent building.
+ Flexibility of building expansion in the North, South and West wings.
+ Size and grain of building footprint; East wing is one big mass; the other wing is the combination of universal modules.
Skin: Composition, materials
Concrete, PVC roof
+ Composition of materials to define working space and inner street
+ Transparency of clear pvc sheet of skylight
- Degradation of materials; concrete and PVC sheet

Space plan: Use
Roof terraces
+ Exterior space provided for upper levels
+ External competence for user interpretations
+ Space for social interaction
+ Reduce building scale
+ Connect to surrounding setting

Service: Composition, use
Integrated gutters
+ Functional requirement
+ Exposed system, placed in the middle of skylight
- Cold bridge
- Poor detailing lead to leakage

Fig 4.2.1 Cultural value mapping of Roof floor plan
(Produced by Vangvasu, 2017)
Cultural Value Mapping - building scale

Structure: Use
Prefabricated structure, Cast in-situation structure

+ correspond to different functions; mushroom column for parking, prefabricated structure for all units
+ prefabricated structure represent the equality of human

Skin: Composition, use

Surface: Composition, use, materials
Partitions, finishes

+ Transparency of materials are selected accordingly to the function behind
+ Material selection of Herman Hertzberger define construction time of Central Beheer
- Combination of rough finish material create dull atmosphere of interior space
- All hard surface materials in a big open space create acoustic problem
- Color palette of selected materials in Central Beheer doesn’t enhance the brightness of interior space

Curtain wall, solid wall

+ Transparency of glazing window correspond with Herman Hertzberger’s social interaction idea
+ Curtain wall make the facade of Central Beheer looks lighter than other buildings in Apeldoorn
+ Solid walls of concrete block define the uses of interior space
- Cold bridge
- Single glaze window

Fig 4.2.2 Cultural value mapping of Ground floor plan
(Produced by Vangvasu, 2017)
**Space plan: Composition, use**

*Office, canteen, roof terraces*

+ Polyvalent space for user interpretations
+ 9x9 meters unit for all working space
+ Dimension of unit based on human social space
+ Flexibility of space
+ Roof terrace above canteen present an initial design idea
+ Balance between public and private space

**Service: Use**

*Installation chamber*

+ Stall all mechanical machines
+ Easy for maintenance
- Too far for ventilation distribution

**Stuff: Composition**

*Light fixtures, furniture*

+ Most furniture is integrated with architecture
- Removal of light fixtures

**Sprit of place**

+ Democratic space
+ Building as a 'city'
+ Competence and performance
- Dead space without performance
- Too complete (city in a city)
Cultural Value Mapping - building scale

Structure: Composition Use
+ correspond to different functions; mushroom column for parking, prefabricated structure for all units
+ Exposed structure both inside and outside

Skin: Composition, use, material
Curtain wall, solid wall
+ Skin composition suggest the use of interior space
+ Transparency of glazing window create an appropriate space for working
+ Curtain wall give light and sharp character of Centraal Beheer
  - Cold bridge
  - Single glaze window

Space plan: Composition
+ Balance between public and private space
+ Variation of height for working, circulation and public spaces
+ Dimension for the universal unit
+ Polyvalent space

Surface: use, materials
Partitions
+ Transparency of materials provide different privacy level
+ Glass block and concrete block are common materials during 1970

Stuff: Use
Timber shelf
+ One of the competence by Herman Hertzberger for working space
+ Railing with dimension

Spirit of place
+ Centraal Beheer as a city - combination of working spaces (building) and inner street (street)
The supportive system acts not only as the physical skeleton but also as the fundamental organization of the spatial and social order of Centraal Beheer building. With its strict geometrical arrangement, the structure components offers both the capacity and limitation for future adaptations in terms of function and space. The prefabricated columns and beams are still functioning well as the building structure and it offers the potential for future growth or reduction.

Apart from the practical considerations, the aesthetic value of the exposed concrete surface and the clear construction logic of its articulation shouldn’t be neglected also. The authenticity of using and expressing concrete by its own property shows a rational approach towards the designing of the building structure, which can also be understood as a hidden guidance for future designs of materializations.
Damages of the installation pipes can be found in part of the exposed ceiling of the in-between circulation space. The updated technologies have also made these systems inefficient for current situations. The space for the installations have full capacity for future adaptations.

Primary and secondary ventilation systems are integrated into the structure, while the heating system above the ceiling have practical issues due to the fact that the heated air have troubles getting down to the working area because of its lightness.

Drainage System

Disintegrated Installations

Damages of the installation pipes can be found in part of the exposed ceiling of the in-between circulation space. The updated technologies have also made these systems inefficient for current situations. The space for the installations have full capacity for future adaptations.

The gutter runs in the middle of the gaps of the "cube" volumes horizontally and vertically, which has led to its dominant expression on the outer facade. Also the aging of the material and the biological erosion has led to a huge reduction to its aesthetic appearance.
Un-sustainability

The evolvement of construction techniques has led to several unsustainable details of the facade. Also, the volume of the building has resulted in a huge loss of thermal energy and sun-shading requirements.

- Massive Surface of Facade
- Huge Thermal Loss

Updated Regulations

- Evacuation Requirements
- Insufficient Natural Light
Degradation of Material

Built in 1972, the building has been standing for 44 years. Most of its physical components have shown evident indications of aging and erosion. This can be observed mainly from the rusted metal facade and the eroded concrete surface.

Also, the timber table finishings and soft outdoor floor on the balcony have shown severe damages due to deformation and the erosion reasons.
Potential of reusing Furnitures

Within the building there are large amounts of small pieces of furnitures and lamps that can be retained due to their historical, functional and aesthetical value.
### Value Assessment - Matrix

<table>
<thead>
<tr>
<th>Setting</th>
<th>Historical</th>
<th>Artistic</th>
<th>Commemorative</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Residential town constructed in 1900</td>
<td>- Proposed extension plan of Apeldoorn city center and additional train station in 1960s</td>
<td>- Surrounding building appearance: constructed before and after Centraal Beheer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td>- Insurance office building</td>
<td>- Situated between wide road, Prins Willem Alexanderlaan, and railway line</td>
<td>- Harmonize elevations with surrounding buildings and context create character of this building as a ‘hill’</td>
<td>- Vacant</td>
</tr>
<tr>
<td>Skin</td>
<td>- The use of modern materials in 1960s: Fair-face concrete, Concrete block, Glass block, curtain wall</td>
<td></td>
<td>- Aluminum frame painted in purple as personal preference of Herman Hertzberger</td>
<td>- Light and transparent façade for natural light and social interaction reasons - Composition of exposed structure on external façade</td>
</tr>
<tr>
<td>Structure</td>
<td>- Steel structure for later addition elements</td>
<td>- Prefabricated structure represent the equality, idea of structuralism</td>
<td>- Exposed construction detail and material</td>
<td>- 2 structure systems for different function: office and parking - Shifted gridline of spatial unit and structure unit created space for service pipes</td>
</tr>
<tr>
<td>Space Plan</td>
<td>- The design of polyvalent space is timeless, performance will define the time</td>
<td>- 9x9 meters universal unit for office building represent the flexibility of space idea of structuralism</td>
<td>- Balance of private and public space</td>
<td>- Unit dimension based from human scale and social dimension - 4 corners of working space in each unit</td>
</tr>
<tr>
<td>Surface</td>
<td>- Neutral color of materials: black, grey, silver, clear</td>
<td></td>
<td>- Exposed material surfaces for unfinished look</td>
<td>- Level of transparency for different level of privacy: concrete block &lt; translucent glass block &lt; transparent glass block &lt; glass &lt; no partition</td>
</tr>
<tr>
<td>Service</td>
<td>- Integrated ventilation system with heating and cooling</td>
<td></td>
<td>- Service pipes location: drop ceiling, exposed, alum box</td>
<td>- One position of installation chamber, distributed vertical and horizontal to all the units</td>
</tr>
<tr>
<td>Stuff</td>
<td></td>
<td></td>
<td>- Most furniture is integrated with the architecture for social interaction purpose</td>
<td>- Herman Hertzberger Light fitting design on the street and working corner</td>
</tr>
<tr>
<td>Spirit of Place</td>
<td>- Polyvalent space</td>
<td>- Building as a ‘city’</td>
<td>- The design and composition emphasize on human interaction</td>
<td>- Office as ‘Home’ - anti hierarchy building - Combination of different performances under architect framework</td>
</tr>
</tbody>
</table>

**High value**

**Medium value**

**Low value**
Cultural Value

*What can we conclude?*

Centraal Beheer is one of the iconic building in ‘structuralism period.’ Architecture for the human is the slogan of this era. Many projects of Herman Hertzberger designed from human scale and behavior in order to achieve an appropriate architecture. By this fact, the value assessment matrix shows that historical value and use value are in almost every aspect.

The aspects influence the design of Centraal Beheer, and enhance structuralism idea are the elements that we value them high. The influential elements are including; historical situation and requirement, as the city center extension plan of Apeldoorn and the requirement for the insurance office. We also give high value for existing context, since it also indicates the character of Centraal Beheer building.

Components that Herman Hertzberger selected to form a high-quality office building consist of structure systems, material property, and size, composition. These features have a direct impact on the spirit of the place. The skin of Centraal Beheer mainly composed of full-height glazing window which maximizes daylight penetration to the working area. Structure and construction details represent the idea of equality and honesty. The composition of things, such as public and private space, different surface, and diverse ceiling height created a ‘city’ like atmosphere. These mentioned aspects are essential in creating the character of this masterpiece of Herman Hertzberger.

For medium value, service systems in this office building are another notable part. The diagrams of ventilation concept and drainage idea show how he integrated technical requirements to the design, but these systems are no longer suitable for present standards. Herman Hertzberger also designed furniture, as light fixtures and seating in this building. Other than aesthetic value, this furniture helps to explain the architect idea about structuralism. Currently, most of the loose piece stuff is removed, left with the furniture that has integrated with architecture. We value space division low as it is too specific, we value more the appropriation of space. Later addition and alteration are also low value for us since there is no historical reason related.
V Summary

Conclusions and Questions
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List of Illustrations
In this final chapter conclusions about the overall research are explained. It serves as a response to the research question and a summary of the research process and products. More importantly, the systematic debates lead to not only a deeper understanding of the building, but also further questions and raised by the discussions.
Material in Centraal Beheer

In Centraal Beheer, materiality, without doubt, plays significant roles in realizing the social and humanism ideas derived from the criticism against functionalism architecture. The realization of Hertzberger’s socio-cultural ideas can be traced from all scales of the building in terms of material, from the dominant glazing facade to the color of the paint onto the wooden partition wall. At the same time, behind the orchestration of various kinds of materials in terms of transparency, texture, color, and techniques, there are principles derived from the architectural references and historical precedents of Hertzberger. Also, there is another layer of the technological context of the time: the building laws, techniques as well as the construction process. The translation of all these concepts and ideas cannot be realized without an accurate expression of materials. Just as Kenneth Frampton wrote:

“Everything turns as much on exactly how something is realized as on an overt manifestation of its form. This is not to deny spatial ingenuity but rather to heighten its character through its precise realization.” (Frampton, 1995)

The Construction of an Ideology

The discussion of Centraal Beheer in the very beginning can not be conducted without mentioning its social and cultural role in the city of Apeldoorn. It is a building that attempted to settle itself in the crucial urban context of the city and at the same time a building that grows deep inside from the abstraction and interpretation of social relationships. The construction of such concepts requires definitely a rational understanding of human as well as sophisticated architectural skills, but the gap remains still quite obvious between the abstract socio-cultural concepts and the physical building materials.

The notion of an inclusive, social space is one of the more appealing aspects of the structuralist discourse in architecture. (Dirk van den Heuvel, 2016)

Hertzberger in his design and construction process offers a rational approach towards the materialization of his ideas. Humanism ideas for him can be considered as the bridge between his concepts and construction. The giant open corners on the facade and the differentiated floor levels indicate an intention of introducing public involvement. An inner street was created to amplify a public atmosphere within the building. Also, by composing the materials and utilizing wall of different transparency, Hertzberger attempts to shape places of varied layers of public and private spheres. He also created a space that has a character of being neutral, through which he encourages individual engagement into the building environment.

Yet, on the other hand, the considerations for human scales and behaviors have the shortcoming of sacrificing a friendly user environment as well as the aesthetic expression of the facade. Hertzberger puts the spatial character prior to practical uses such as a comfortable acoustic environment, enough natural light, and contact with nature. Moreover, freedom for engagement is offered to the users but only within the framework of a strict unit. Also, despite the well-composed units and fragments, the building as a whole has the trouble of organizing itself in a proper sense of collectivity both in its urban settlement and in its management.

The material language of Centraal Beheer could be understood as a straightforward expression of the social propositions of the architect. But the question still remains: Is the strict and rigid order a perfect answer for the realization of social ideas such as encouraging social engagement and involvement? How to deal with the balance between the pure units and a repetitive totality due to the differences in scale and context? How to balance the mutual relationship between an architecture as a frame for the society and as an event itself?

From Clarity to Complexity

Another way of understanding the materiality of Centraal Beheer is through the tectonic perspective. The highly rational methodology of dealing and expressing materials and construction process can be seen from his careful treatment for the joints. The exposed concrete surfaces indicate their role as the what Semper defines as "compressive mass" and "tensile frame" by revealing the articulation process and joint techniques of the material. Different materials, services, and functions are composed under a highly organized order in which the integration plays a dominant role. Timber, metal, glass, concrete are placed together in delicate joints celebrating their different properties and functions in the space. This approach clearly has relation to the design philosophy of Viollet Le Duc, Belage and Louis.I.Kahn who consider that an "honest" expression of the construction process and load-bearing principles as a fundamental rule for architecture.

While inconsistent logic in dealing with materials can also be found in Centraal Beheer. The "honest" expression of material surfaces was compromised when all the timber components in the building were painted black. This treatment covers the original texture of the material and makes it part of the spatial language due to its visual similarities with the metal gutters in order to create a neutral outside atmosphere. Also, the structural system would demand less load-bearing requirements on the top floors and more on the lower parts, but the units are all treated equally regardless of their load-bearing requirements. The logic of materials here has given its way to a technological expression derived from the social conception of equality. Thus it might be valuable to also ask what does a logical approach of materialization mean to architecture?

Epilogue

In his search for a structuralism architectural language, Herman Hertzberger developed a pure and powerful expression. It might be true that the social conceptions remain full of uncertain complexities that are difficult to reach with a definitive form, while a strong physical statement such as Centraal Beheer is surely inspirational in its approaching for the materialization of an ideal society.
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