Appendix

Reflection;
Analysis of the spatial system, organisation and spatial relations;
Conclusions

Reflection

Reflection

Reflection on the P1 report

In general, the report still lacks coherence. There is a main research question with sub questions. But in the analogy of the human body, questions have sometimes been devised for each body part (and not always clearly noted), while the sub-questions have been neglected with the lack of conclusions. The problem is that a lot of questions are answered, but that they have too little to do with the main and sub research questions. Findings have not been critically reviewed and translated into conclusions and remain on the surface. The step towards answering the sub-questions, and highlighting the relationship between the architectural aspects and qualities, is not made sufficiently. Also a clearer research method that ensures that there is a common thread in the report, combined with a clearer format, would have contributed to a better overall coherence.

A conclusion is missing where the main research question and sub-questions are answered, based on the information found in the analyses. The historical interpretation is intended to explain our interpretation of the essence (DNA) of the building, and can therefore be read as somewhat of a conclusion for the value assessment, but the report overall lacks an answer to the main question and sub-questions. The idea was to allow the analysis as a whole to provide the answer to the questions. But without a separate conclusion for architecture, building technology and cultural values, and a final conclusion with an answer to the main research question, that answer is not clear. Now the reader has to process, summarize and define all the findings him-/herself in order to try to get an answer to the research questions. Many architectural aspects have been found, defined and sometimes analysed. But a clear critical analysis and reflection that highlights the relationship with architectural qualities needs to be included.

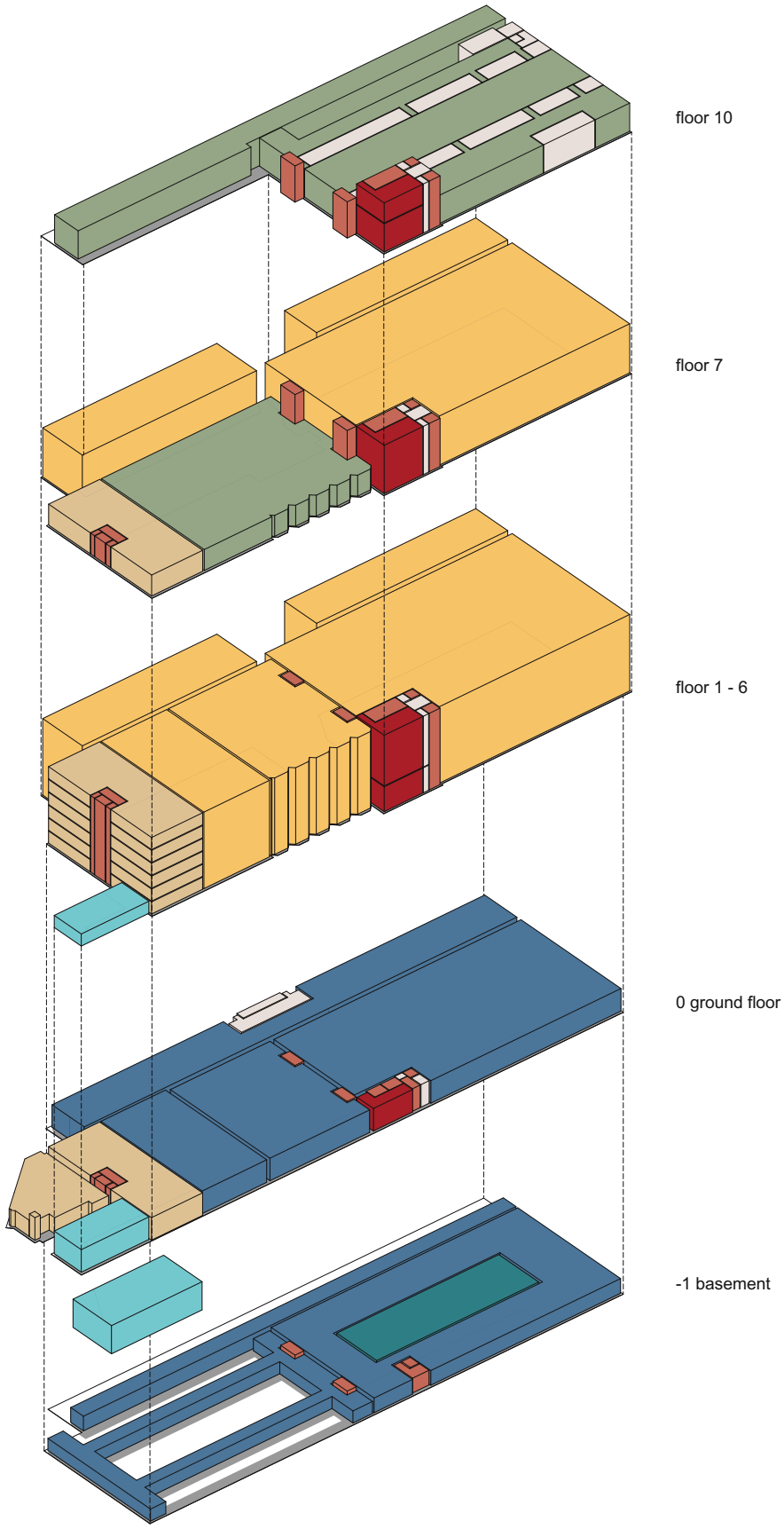
The analysis could have included themes like redevelopment, sustainable transformation, preserving industrial heritage and architecture, and valuation methods. Levels of significance have hardly been mapped by distinguishing building parts of different values. Argumentation of the valuation in the value matrix has now only been made for site and surroundings, while other parts of the analysis remain more on the surface, with no specific concrete parts being identified in the building. This makes it harder to point out problems and opportunities. Therefore it is more difficult to find an answer to the sub-question related to cultural values and define the tolerance for change.

What is needed to complete the report, is for each chapter (architecture, building technology and cultural values) a separate conclusion with an answer to each sub question, with a final conclusion that answers the main research question. That means 3 sub conclusions and 1 final conclusion. These conclusions are accompanied by the necessary analysis drawings with a focus on organization, the spatial system, and architectural qualities and spatial relationships. These themes are important to glue together the somewhat fragmented analysis components and to answer the research question. On the following pages you find the additional analysis drawings followed by the conclusions.

Spatial System

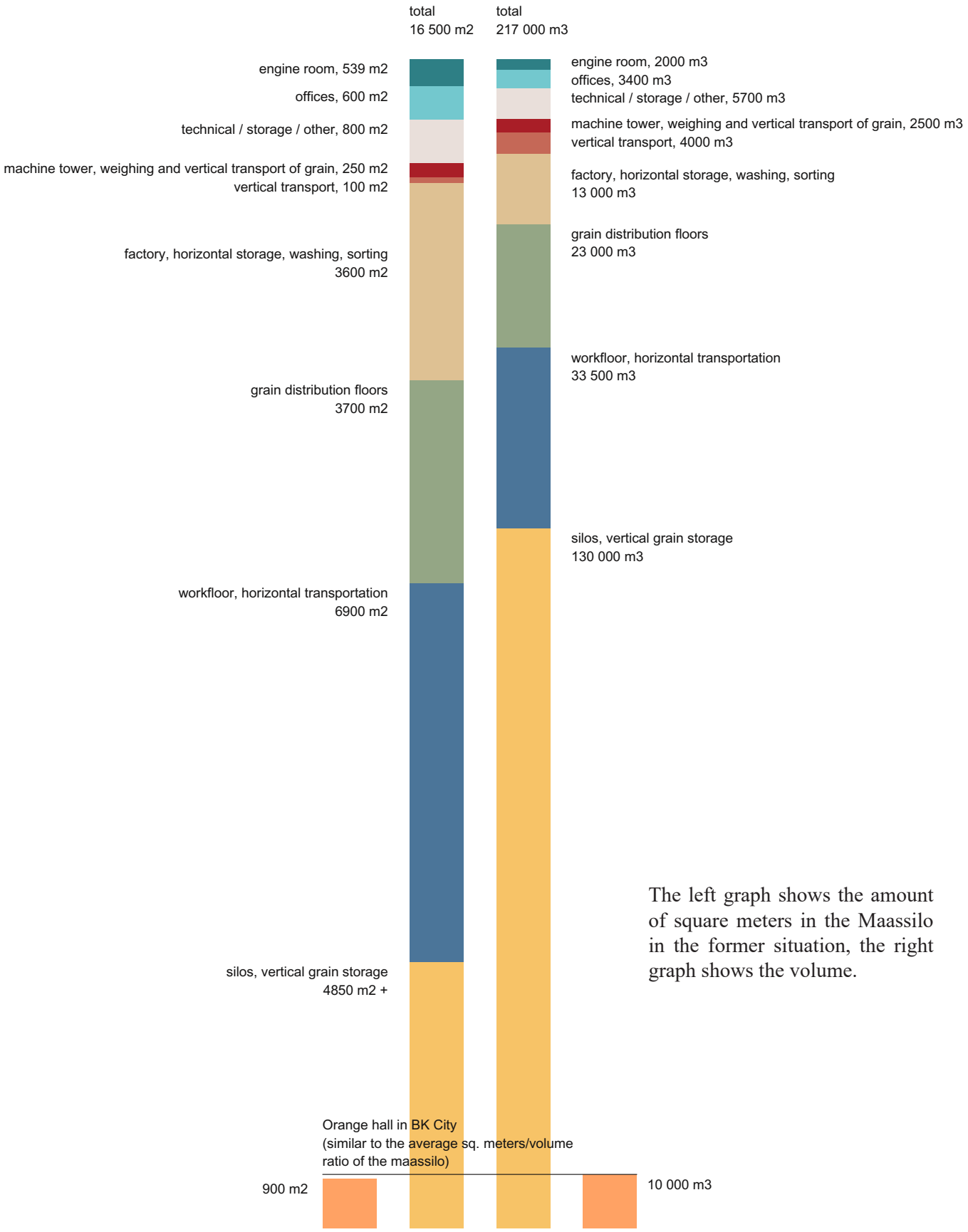
Spatial system

Former situation



Legend: see the graph on the right page

maassilo, spatial system
former situation

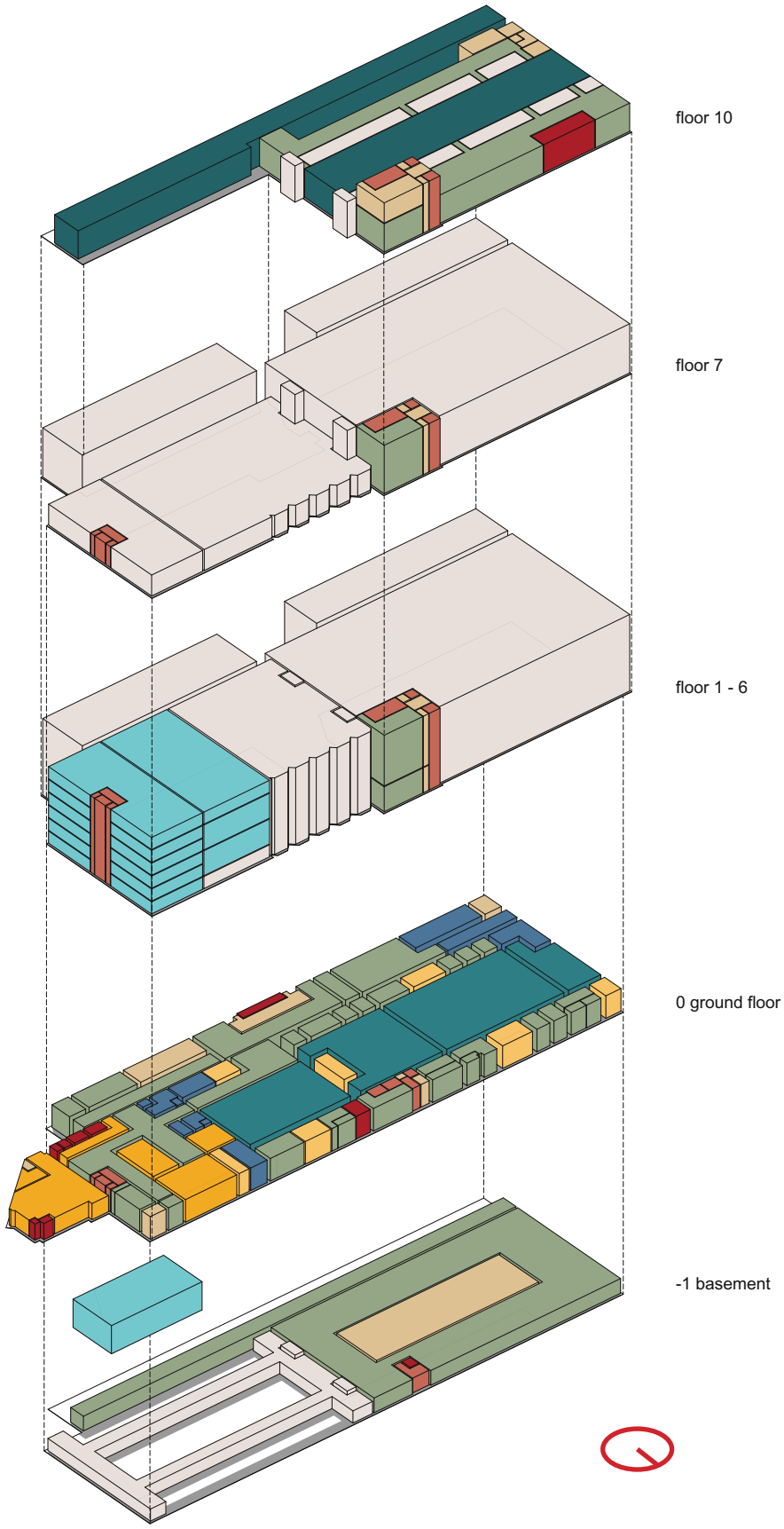


The left graph shows the amount of square meters in the Maassilo in the former situation, the right graph shows the volume.

maassilo, spatial size ratios
former situation

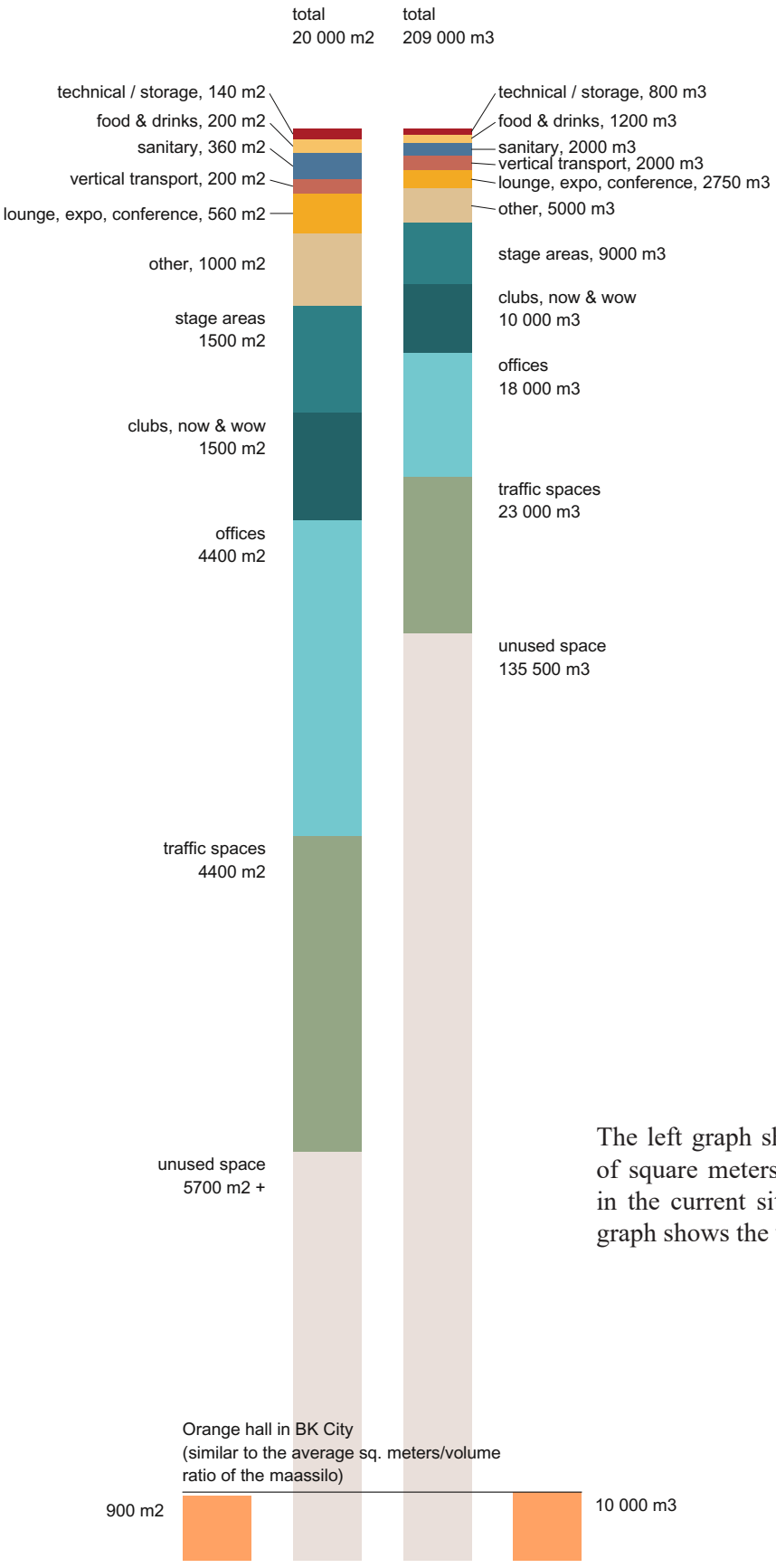
Spatial system

Current situtation



Legend: see the graph on the right page

maassilo, spatial system
current situation

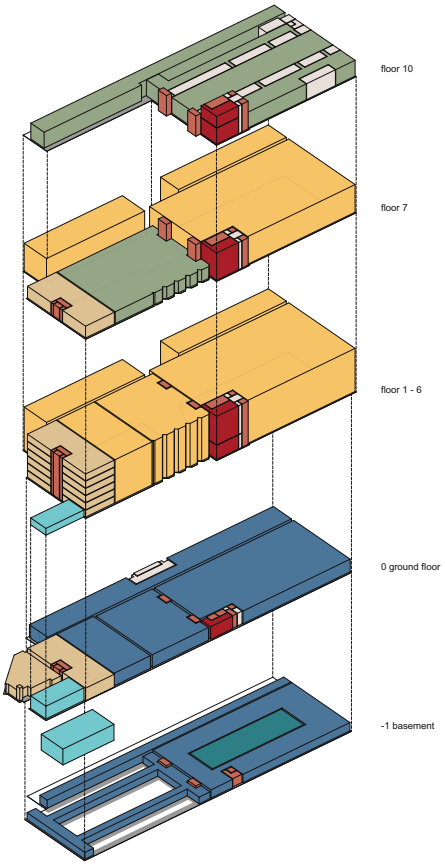


The left graph shows the amount of square meters in the Maassilo in the current situation, the right graph shows the volume.

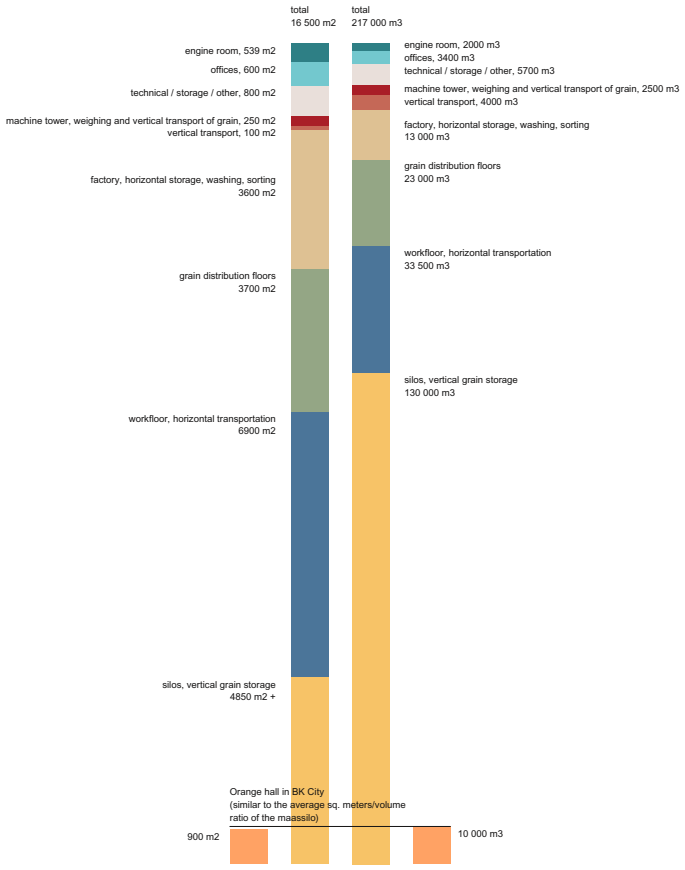
maassilo, spatial size ratios
current situation

Spatial system

Former situation



maassilo, spatial system
former situation

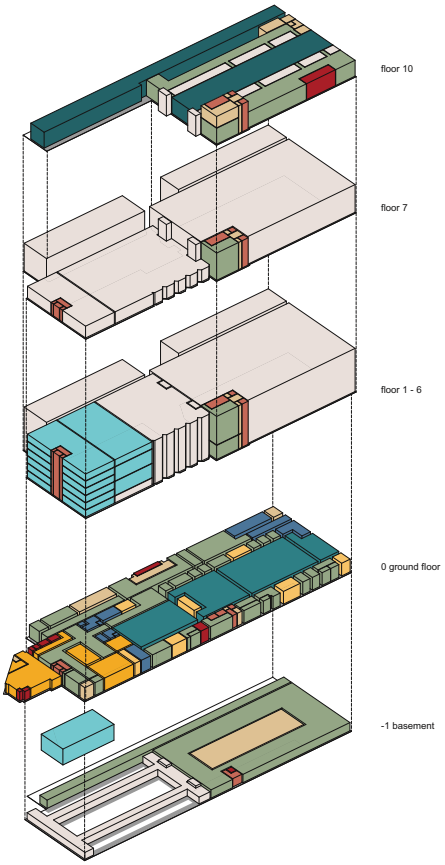


maassilo, spatial size ratios
former situation

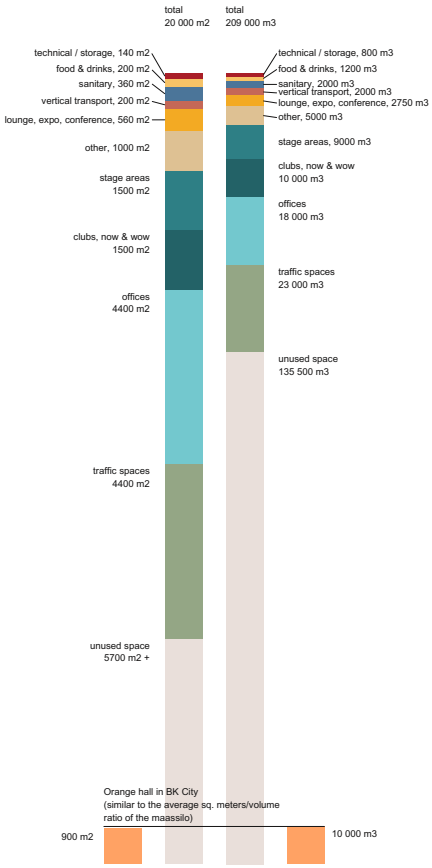
- There is a certain logic, claraity in the spatial organisation. It is purely functional, because it is used as a machine.
- Spaces are often connected in the same way and the layers of time are very well visible.

- The ratio of volume and square meters is similar to that of the Orange Hall in BK City (Delft, NL). The orange hall fits approximately 22 times in the volume of the Maassilo. For example, the Depot Boijmans Van Beuningen in Rotterdam has a more compact surface to volume ratio. The Depot its amount of square meters is similar (approx. 15 000 m2), while the volume fits twice in the Maassilo (100 000 m3).
- Half of the building volume is used for (temporary) storage of grain, eventhough it may seem like 80% of the building was used for storage when you're standing outside.

Current situation



maassilo, spatial system
current situation



maassilo, spatial size ratios
current situation

- The ground floor spaces are fragmented, which makes it difficult to understand.
- The relatively large amount of traffic space implies that it is difficult to navigate a lot of people through the building at once.
- The interesting basement area is hardly used for an actual activity besides traffic, wardrobe and smoking area.
- The Maassilo currently lacks an overall coherency and due to the fragmentation of the floorplan, the layers of time are more difficult to understand.

- Only a third of the building volume is used, while three quarters of the floor space is used.
- The large amount of unused space can be seen as an architectural quality. The high volume that goes with a smaller amount of square meters, allows for large open spaces.

Spatial Organization

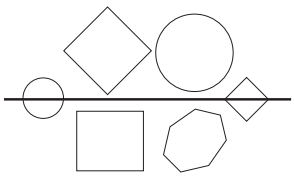
Organization

Clustered

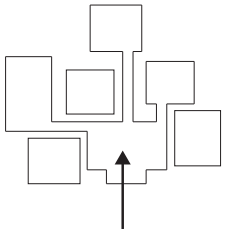
The Maassilo is composed of a series of spaces that relate to each other. According to the theories of Ching (2010), these spaces fall under the category of a clustered organization. A clustered organization can accept within its composition spaces that are dissimilar in size, form, and function, but related to one another by proximity or a visual ordering device such as symmetry or an axis (Ching, 2010, p. 222). This chapter will analyze in diagrams per floor plan what kind of clustered organization is present. Since in some floor plans there are combinations present of the principles in the diagrams below, we have combined this in one diagram. Axis and path are considered as one.

Conclusion:
Every floor plan contains a clear path and axis along or through clustered spaces. The seventh and tenth floor also each contain one space that is directly connected to an entry point of the floor.

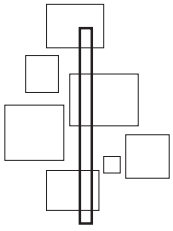
The path on the ground floor is clearly visible when standing in the actual spaces, however, in case of a crowded event this path may become less visible.



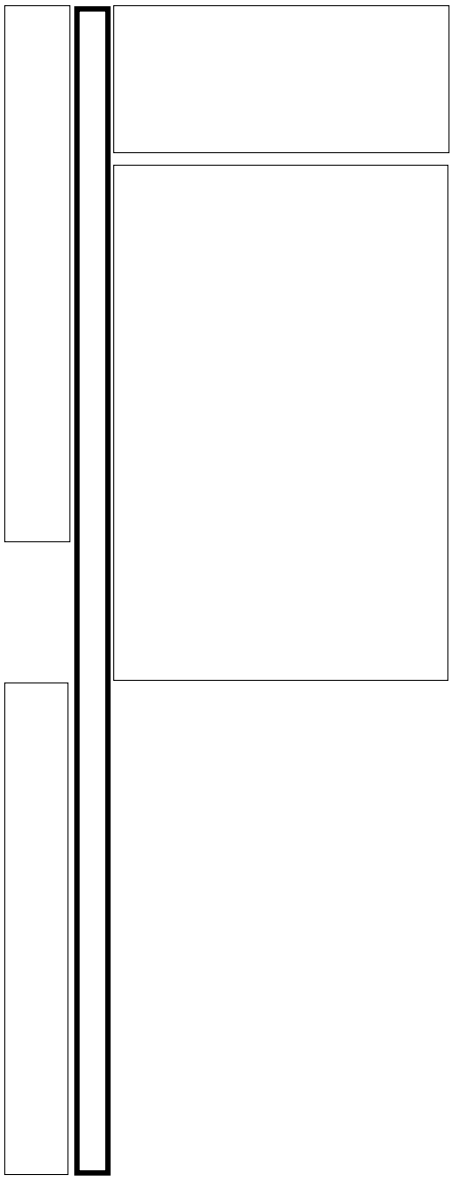
Organized by an axis
The axis may go along or through spaces.



Clustered about an entry
Entry links directly to spaces

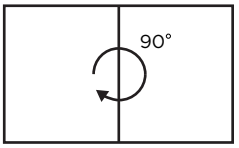


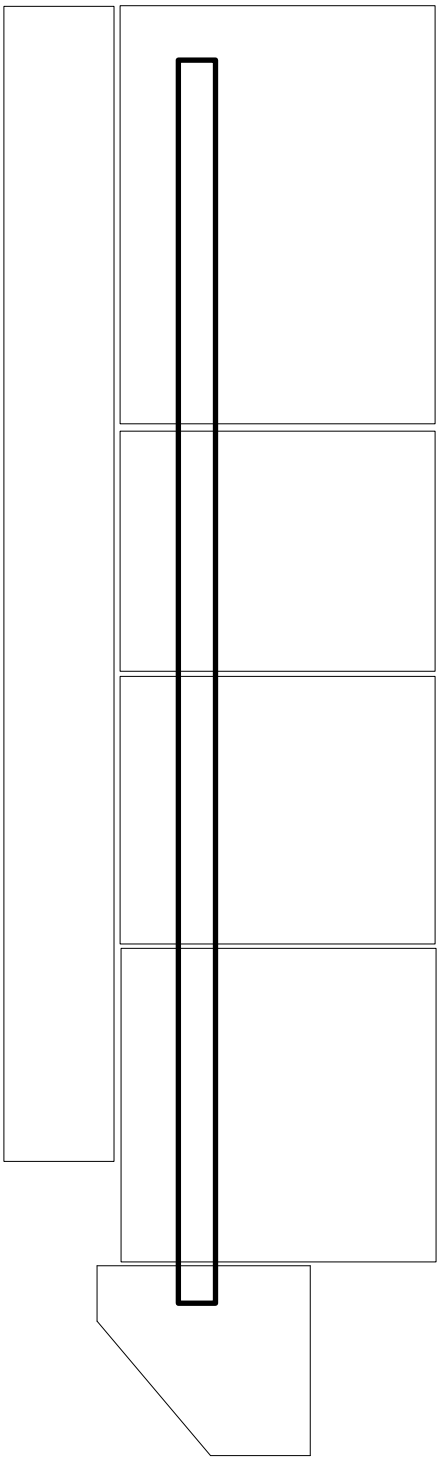
Clustered along a path
The field of a space may overlap the path.



Basement - 1:750

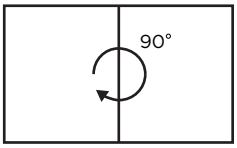
Spaces are clustered along a path / axis.



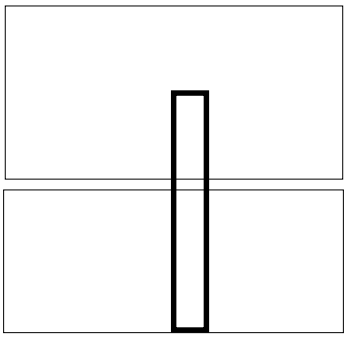


Ground Floor - 1:750

Spaces are clustered through a path / axis that is located in five spaces. Four rectangular spaces overlap the path and are connected to the longitudinal space, which can be reached from the path as well.

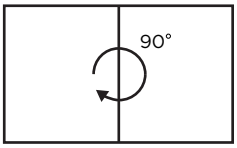


rotate the booklet 90°for an optimal view

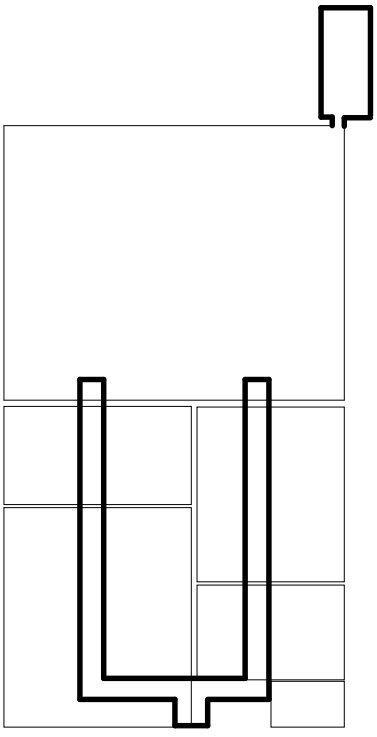


Silo's - 1:750

Spaces are clustered through a path / axis that originates from a vertical transport point. The path is located in the spaces.

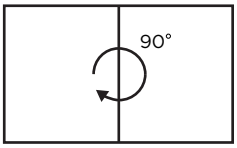


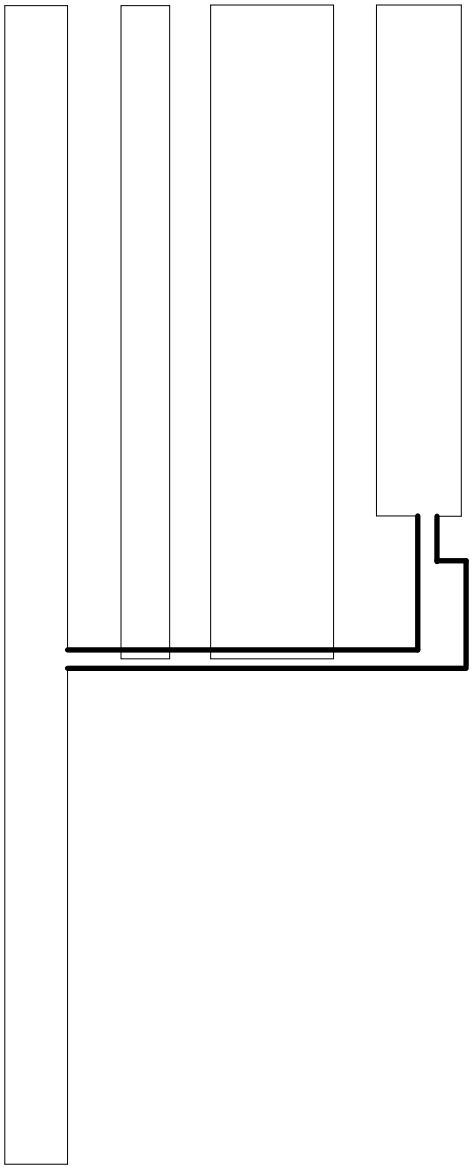
rotate the booklet 90°for an optimal view



7th Floor - 1:750

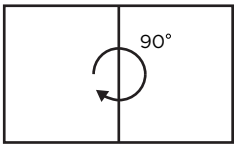
Combination of a space that is directly connected to a vertical transport point and spaces that are clustered through a path / axis that also originates from a vertical transport point.





10th Floor - 1:750

Combination of a space that is directly connected to a vertical transport point and spaces that are clustered through a path / axis that also originates from a vertical transport point.



rotate the booklet 90°for an optimal view

Organization

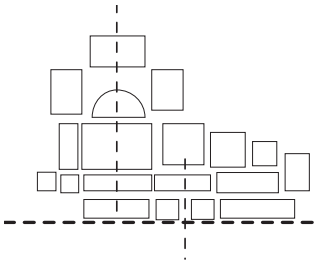
Axial conditions

The pattern of the clustered spaces within the floor plans of the Maassilo show no inherent place of importance. According to Ching (2010), the significance of a space must then be articulated through its size, form, or orientation within the pattern. The importance of spaces within a floor plan can be showed by pointing out the axial conditions. These axial conditions are used to strengthen and unify portions of the clustered organization and help articulate the importance of a space or series of spaces within the organization (Ching, 2010, p. 222).

The diagrams on the following pages show per floor plan what the significant spaces are by pointing out the axial conditions.

Conclusion:
In the diagrams of both topics, clustered organization and axial conditions, it is evident that all floors are characterized by a longitudinal path / axis, and axial condition(s), except for the tenth floor. The top floor is characterized by a path and an axial condition that is perpendicular to the dominating longitudinal axis of the Maassilo.

A possible reason for this could be the fact that the first building of J.P. Stok is not part of the floor plan of the tenth floor, because it only goes up eight floors. This shortens the length of the floor plan by approximately half. The longitudinal building by Postma is still present in the floor plan of the tenth floor. This part, however, can be considered subsidiary because of its small width. This means that the length of the overall floor plan is shortened by half, hereby turning the path and axial condition by 90 degrees.

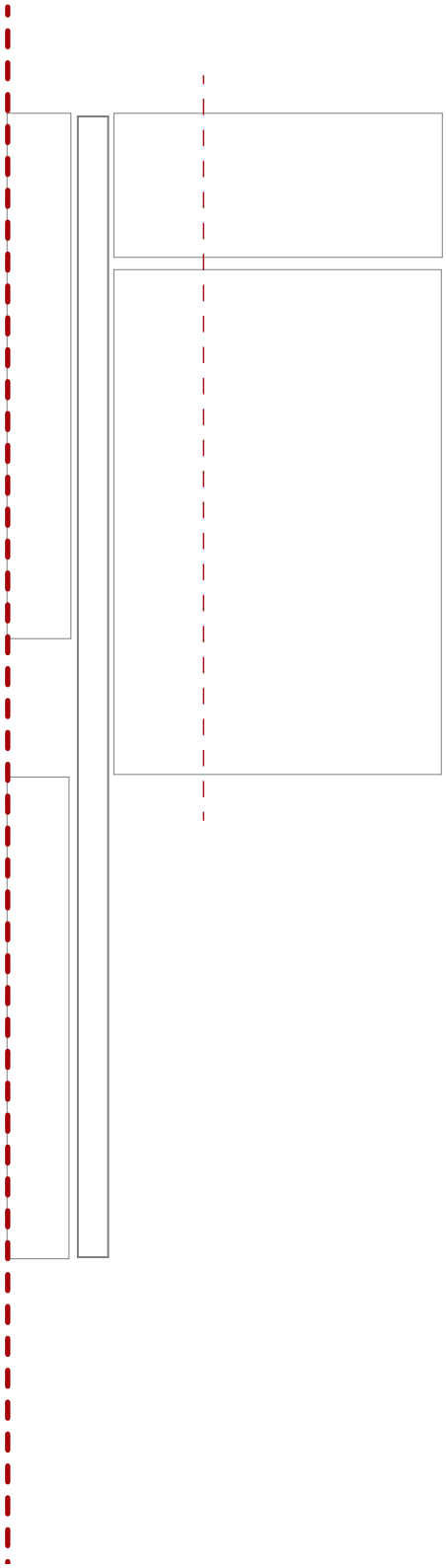


Axial conditions
Show signifance of spaces within a floor plan.

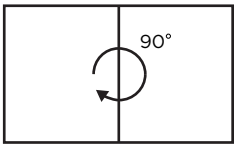
Legend:

Longitudinal axis Maassilo

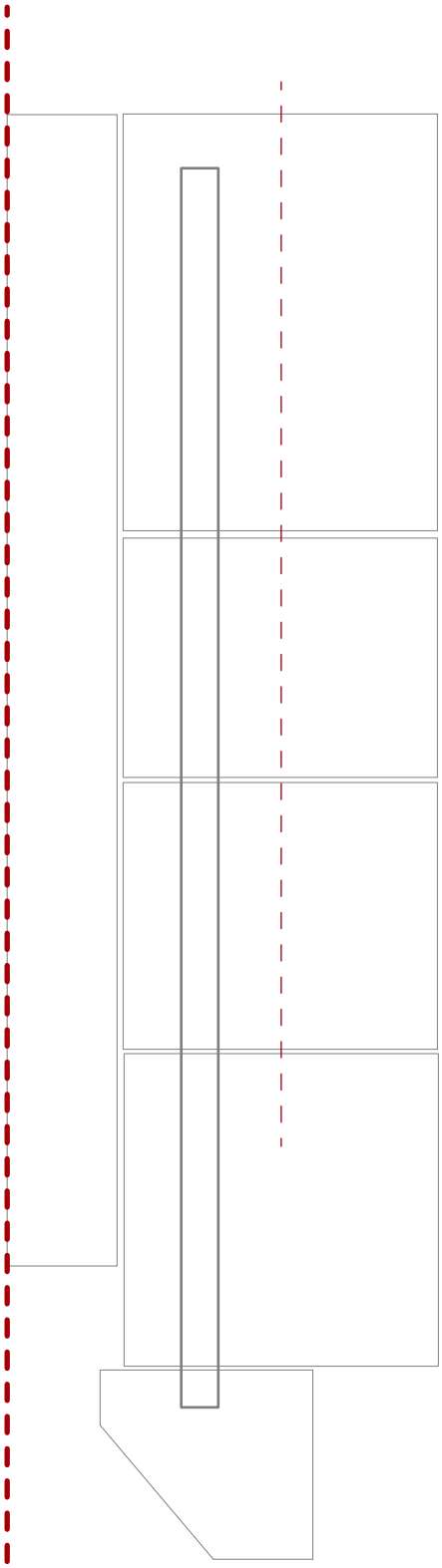
Axial conditions



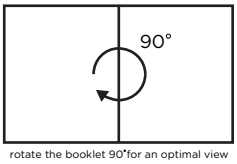
Basement - 1:750



rotate the booklet 90°for an optimal view



Ground Floor - 1:750



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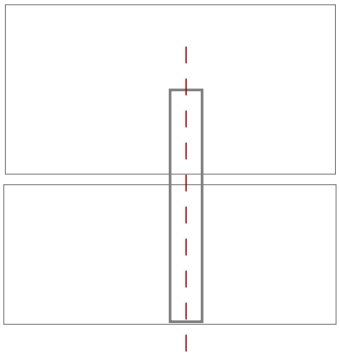
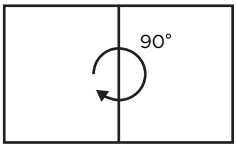


Silo's - 1:750



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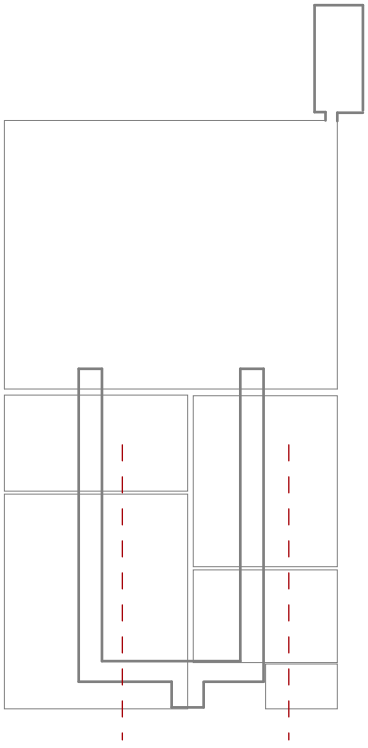
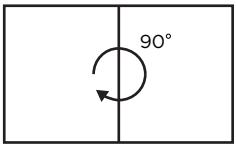
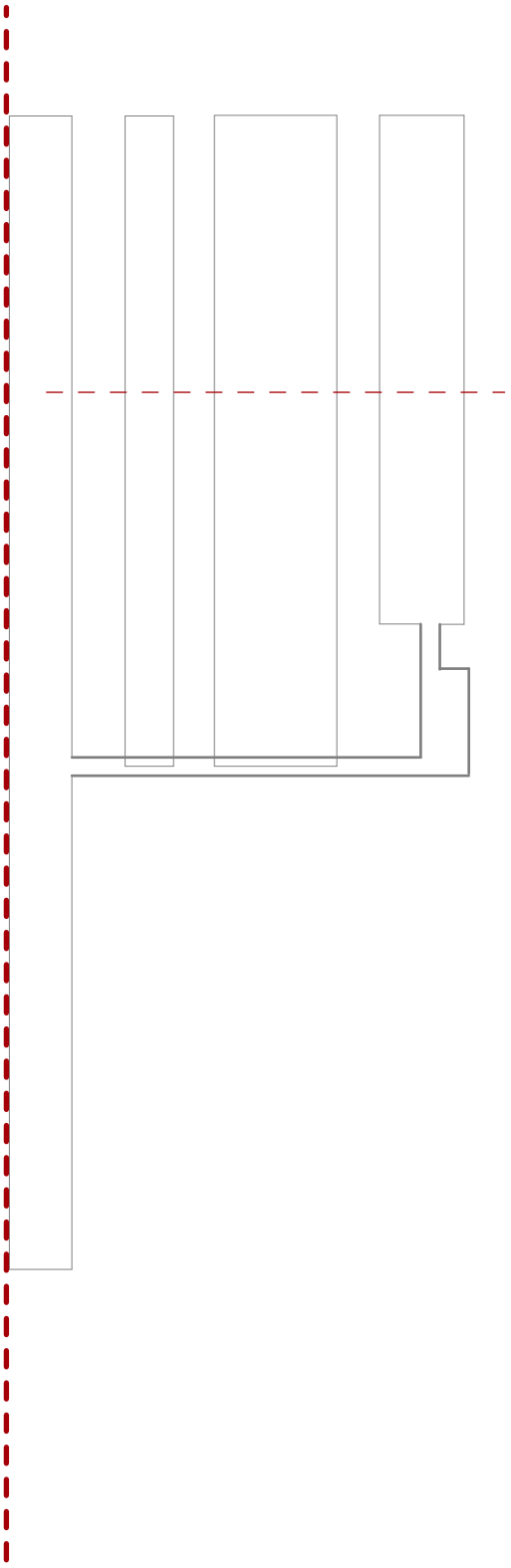


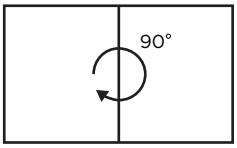
7th Floor - 1:750



rotate the booklet 90°for an optimal view



10th Floor - 1:750



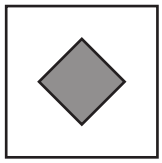
rotate the booklet 90°for an optimal view

Spatial Relations

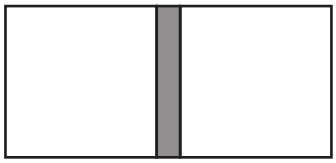
Composition of Spaces

Spatial Relations (Introduction)

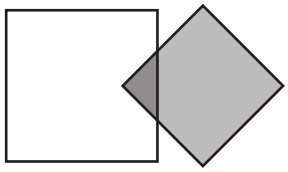
The Maassilo is composed of spaces which are related to each other by function, proximity, or a path of movement. This chapter shows the basic ways the spaces of the Maassilo are related to each other and organized into coherent patterns of form and space (Ching, 2010). This introduction shows the composition of the apparent spaces inside the building. The diagram underneath shows the four different types of spatial relations that occur in the building. Each sub-chapter is explained through diagrams, floorplans and legends.



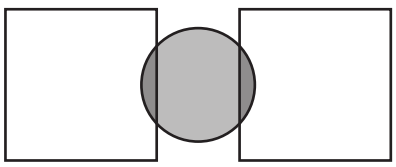
Space within a Space
A space may be contained within the volume of a larger space.



Adjacent Space
Two spaces may abut each other or share a common border.

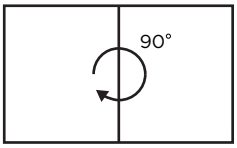


Interlocking Space
The field of a space may overlap the volume of another space.



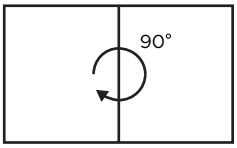
Spaces linked by a Common Space
Two spaces may rely on an intermediary space for their relationship.

Basement - 1:750



rotate the booklet 90°for an optimal view

Ground Floor - 1:750



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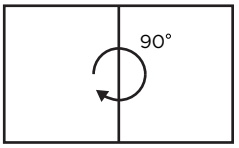
Silo's - 1:750



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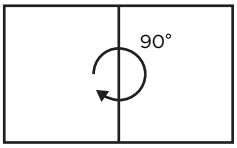
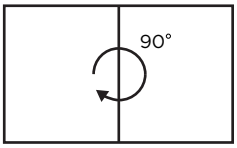
7th Floor - 1:750



rotate the booklet 90°for an optimal view

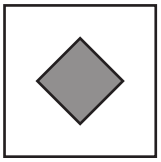
10th Floor - 1:750



rotate the booklet 90°for an optimal view

Space within a Space

Spatial Relations



Definition by D.K. Ching, 2010:
“A large space can envelop and contain a smaller space within its volume. Visual and spatial continuity between the two spaces can be easily accommodated, but the smaller, contained space depends on the larger, enveloping space for its relationship to the exterior environment.” (Ching, 2010, p.186)

Conclusion:
This spatial relation is profoundly expressed in the Maassilo through the large open spaces within the dance halls. The spaces on the ground floor are part of a larger whole and are defined by their openness within the total volume. This openness is created by replacing the large and heavy concrete columns with slim columns of steel. This visual continuity creates a central dance floor where people can easily manoeuvre and locate themselves in the larger space.

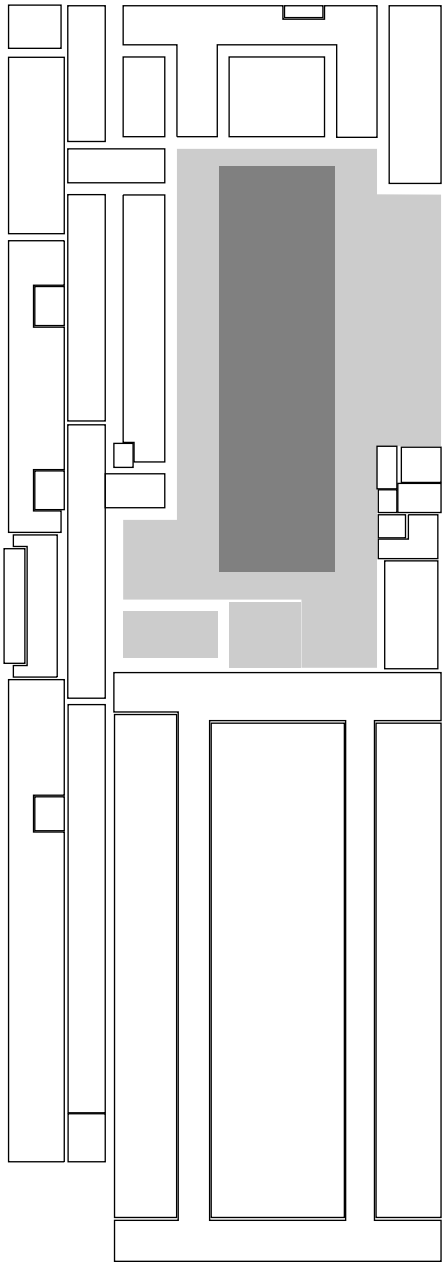
In the basement there is also an space within a space. This space is defined by an elevated platform that holds the steel flywheels, which used to generate energy for the transportation of the grain.

Legend:

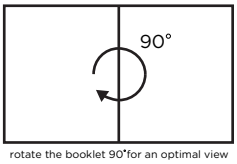
Non Participating Spaces

Spaces in Space

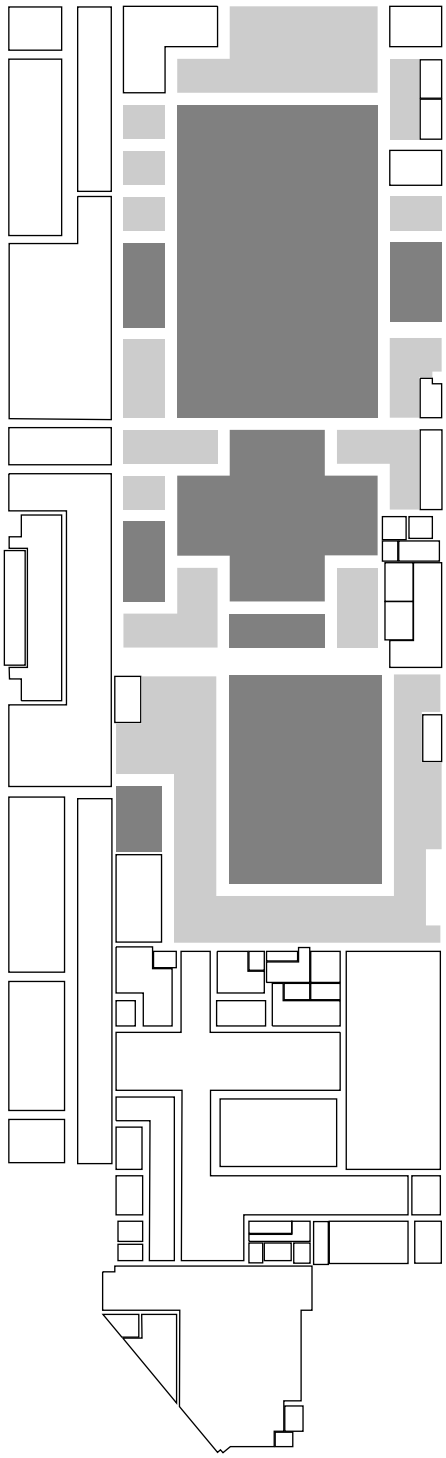
Related Spaces



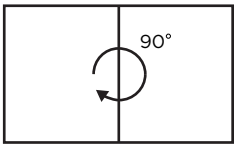
Basement - 1:750



rotate the booklet 90°for an optimal view



Ground Floor - 1:750



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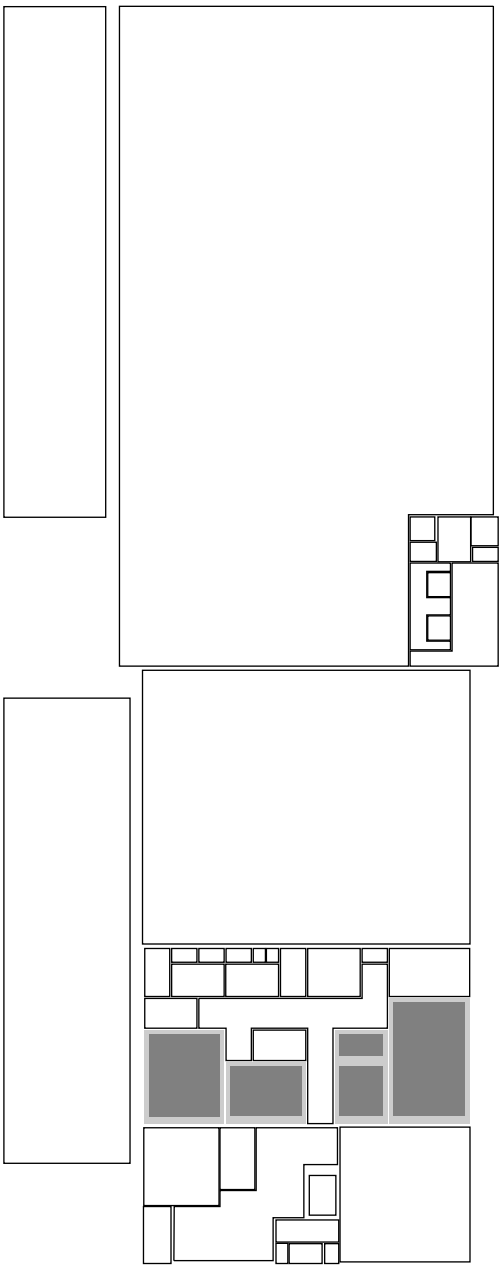
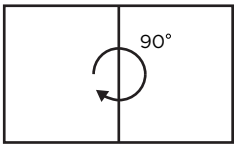
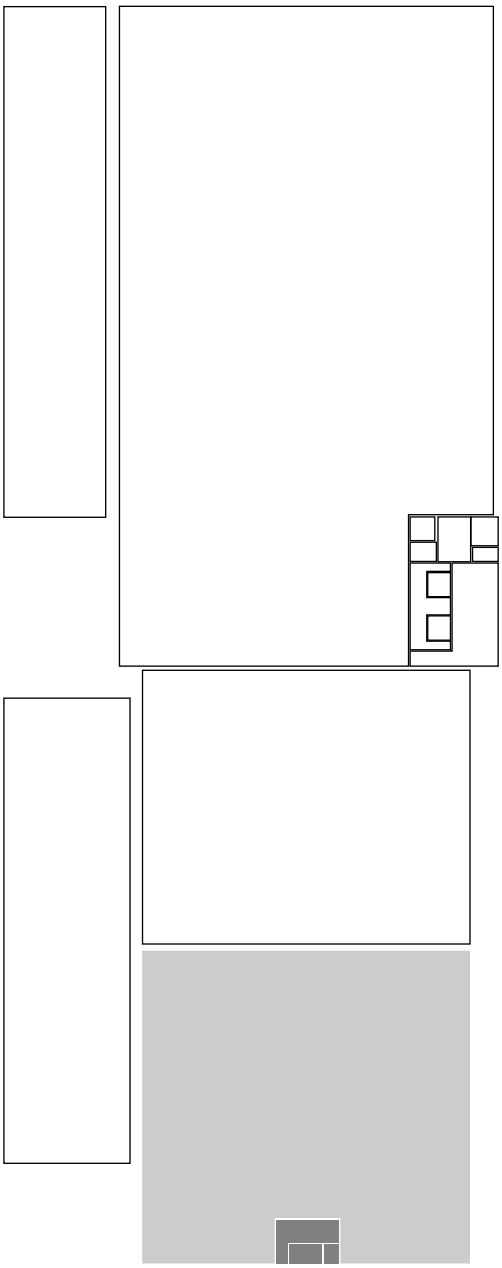


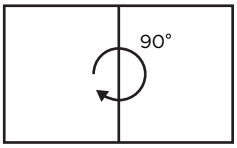
Silo's - 1:750



rotate the booklet 90°for an optimal view



7th Floor - 1:750



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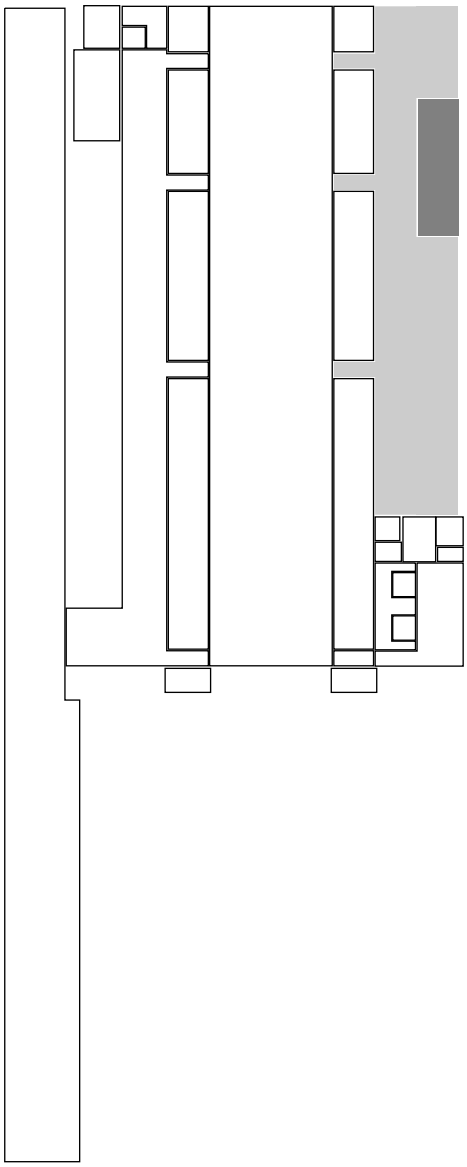
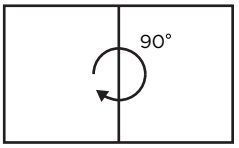


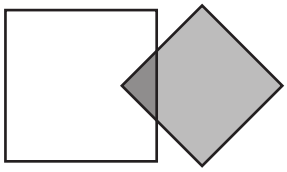
10th Floor - 1:750



rotate the booklet 90°for an optimal view

Interlocking Space

Spatial Relations



Definition by D.K. Ching, 2010:
"An interlocking spatial relationship results from the overlapping of two spatial fields and the emergence of a zone of shared space. When two spaces interlock their volumes in this manner, each retains its identity and definition as a space. But the resulting configuration of the two interlocking spaces is subject to a number of interpretations." (Ching, 2010, p.188)

Legend:

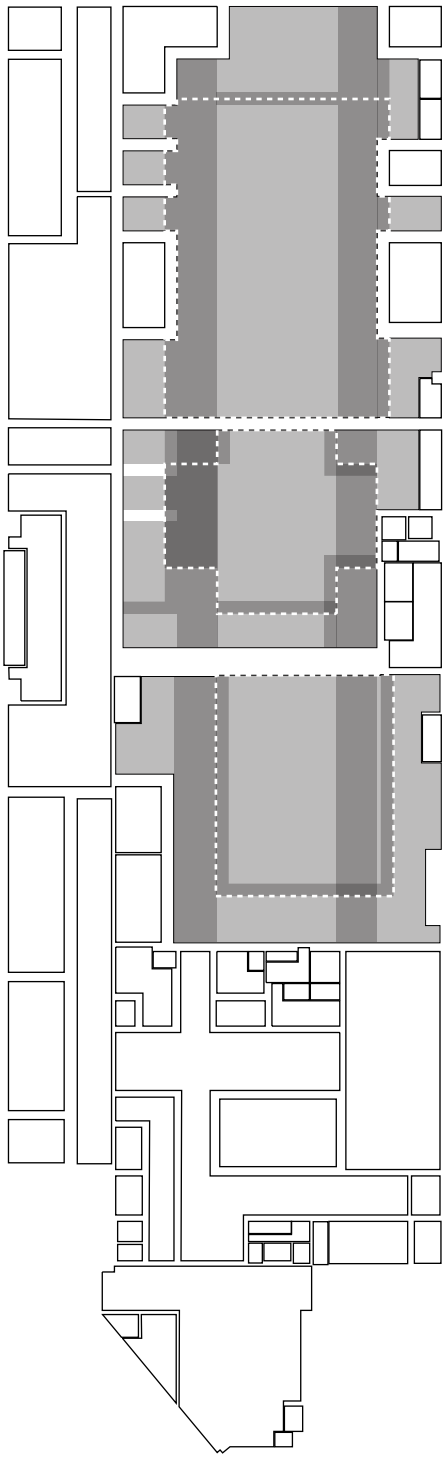
Non Participating Spaces

Interlocking Spaces

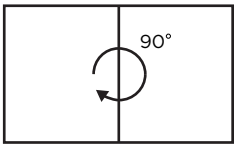
Dominant Spaces

Conclusion:
Within the Maassilo complex the spatial relationship of interlocking spaces only shows itself on the ground floor. Here the three dance floors form the dominant spaces, highlighted by a dashed white line. These spaces relate to the surrounding spaces and within them smaller spaces overlap with each other. The diagram is composed of spaces each defined by grey surfaces which have all the same opacity. The spaces that overlap will become darker, depending on how many surfaces overlap each other.

What defines these spaces is that you can see clear axis that are positioned horizontally and connect each of the dance halls to each other. Within these spaces there is access to the bars, the restrooms and the exits.



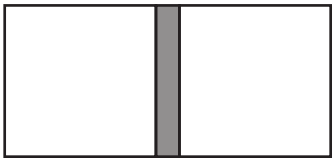
Ground Floor - 1:750



rotate the booklet 90°for an optimal view

Adjacent Space

Spatial Relations



Definition by D.K. Ching, 2010:
"Adjacency is the most common type of spatial relationship. It allows each space to be clearly defined and to respond, each in its own way, to specific and functional or symbolic requirements. The degree of visual and spatial continuity that occurs between two adjacent spaces depends on the nature of the plane that both separates and binds them together." (Ching, 2010, p.190)

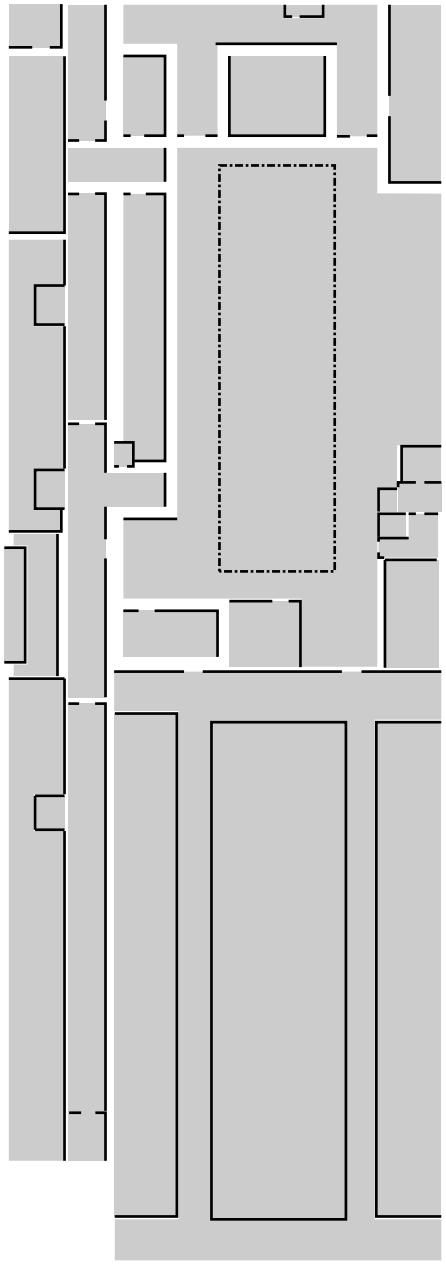
Conclusion:
Even though Ching already mentions it, the spatial relation of adjacency is the most common relation in this building since every space is at least adjacent to one other space.

Within the building most borders are defined by a continuous visual and spatial disconnection, un-less there is a door placed in this border. The most interesting floor is the ground floor where all different sorts of borders are showcased. The grid pattern of the construction clearly defines spaces by creating a partly visual discontinuation between the adjacent spaces. You notice that the ground floor forms a larger whole due to the lack of closed borders.

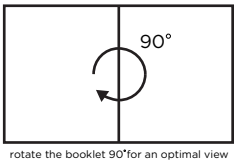
Legend:

- Adjacent Spaces
- Closed Border (Wall)
- Open Border (Door)
- Border defined by Columns
- Partly open/closed Border
- Border defined by Height difference

This continuity was formerly needed for the workers who operated the grain silo's and is currently needed for the accommodation of large groups of people.



Basement - 1:750



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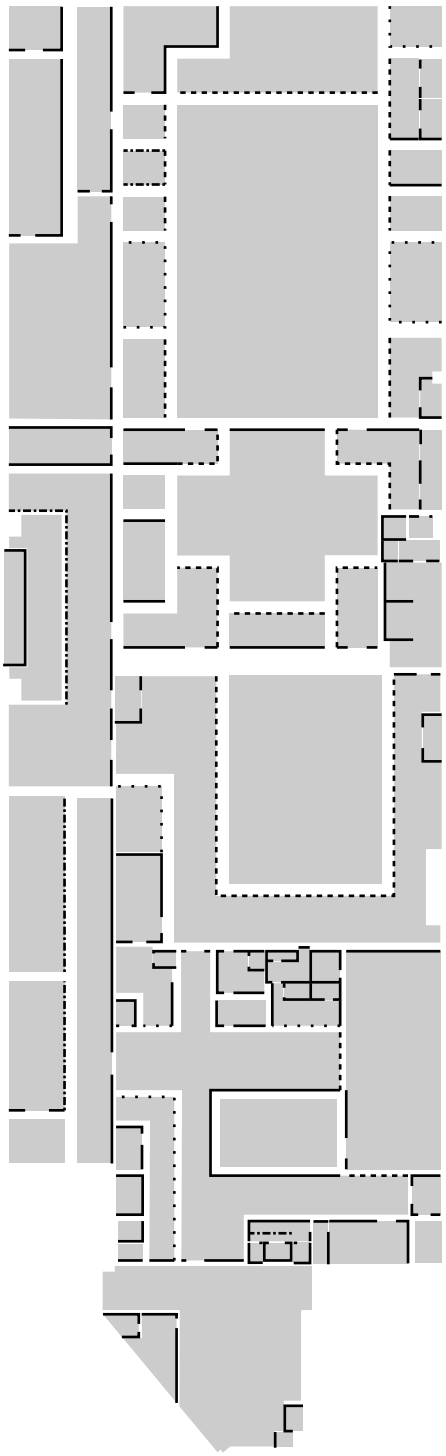
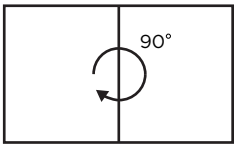


Ground Floor - 1:750



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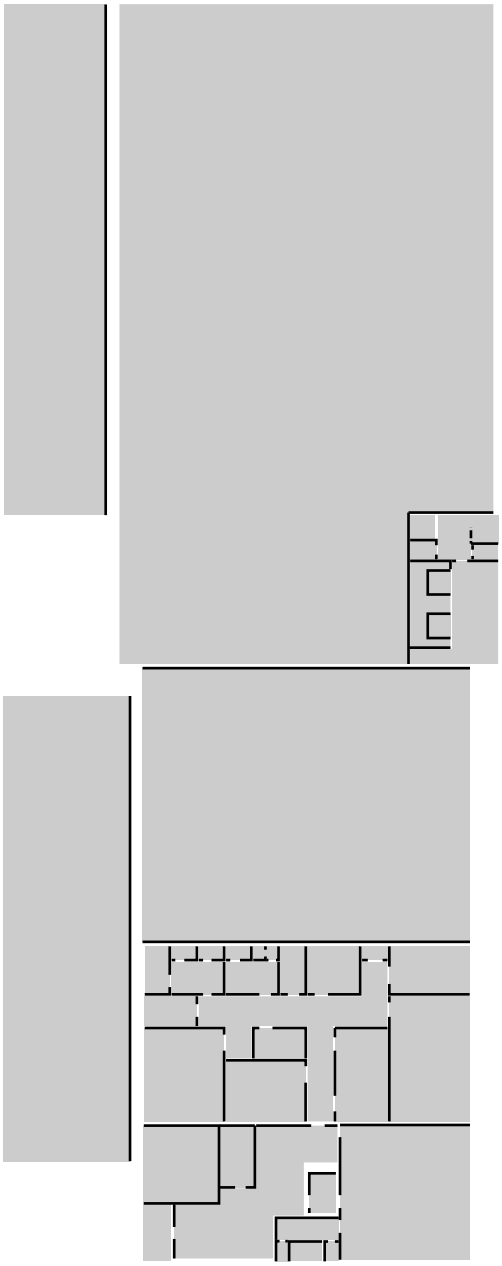
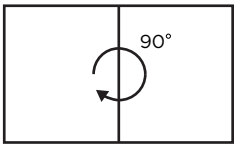
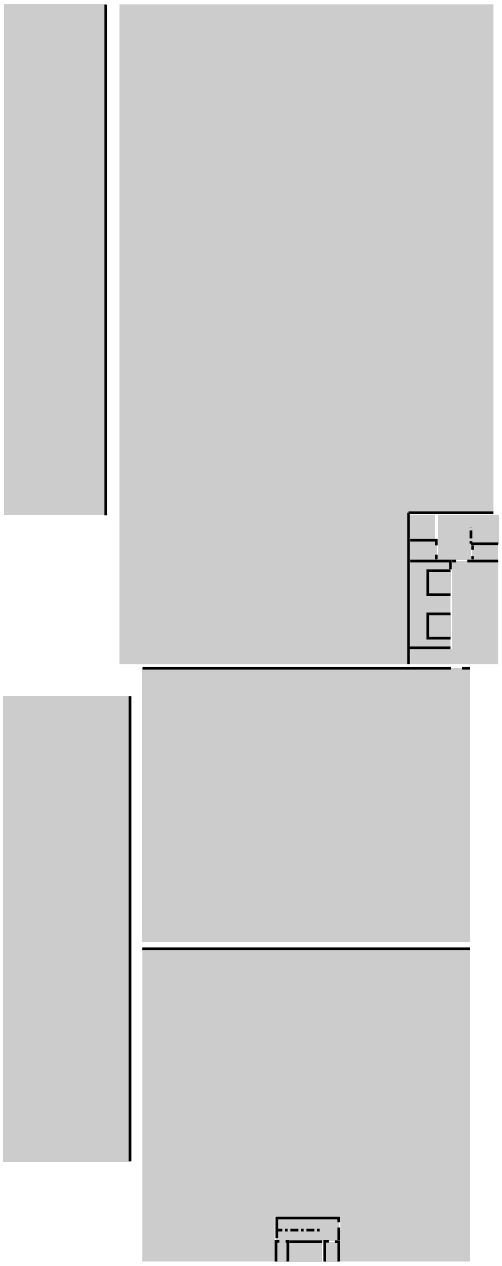


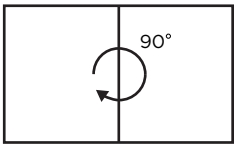
Silo's - 1:750



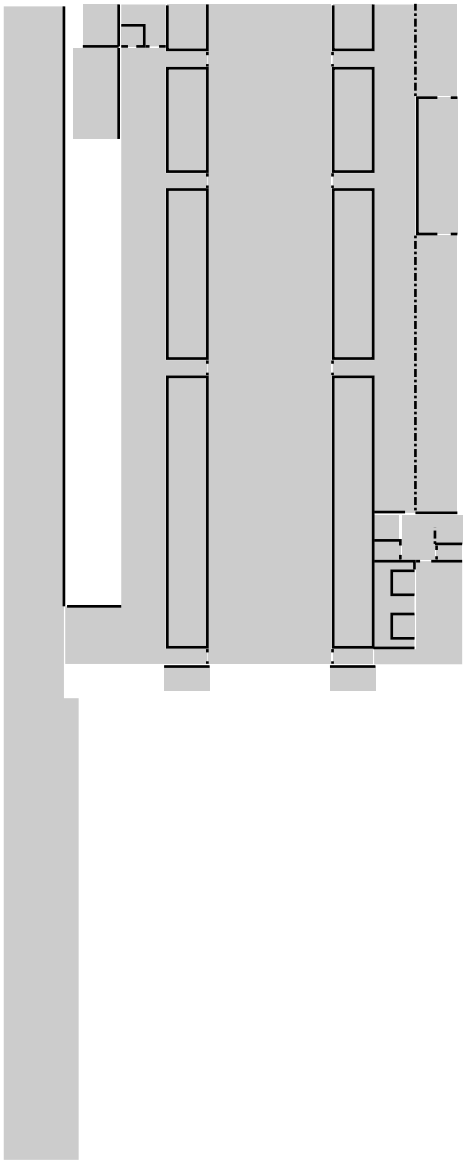
rotate the booklet 90°for an optimal view



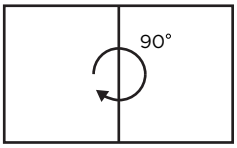
7th Floor - 1:750



rotate the booklet 90°for an optimal view



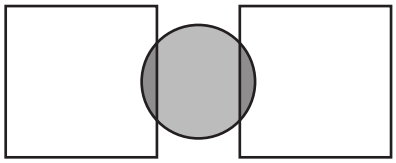
10th Floor - 1:750



rotate the booklet 90°for an optimal view

Spaces Linked by a Common Space

Spatial Relations



Definition by D.K. Ching, 2010:
"Two spaces that are separated by distance can be linked or related to each other by a third, intermediate, space. The visual and spatial relationship between the two spaces depends on the nature of the third space with which they share a common bond. The intermediate space can differ in form and orientation from the two spaces to express its linking function." (Ching, 2010, p.192)

Conclusion:
The common space is mostly defined by its characteristic of connectivity. Therefor the diagrams show the spaces that are often related to the theme of routing. The spaces provide access to different spaces and in their turn become defined as the common space that links two other spaces. The black arrowed lines show the direction and positioning of the connection between the common space and the adjacent space.

All common spaces take a central position within the composition of all the spaces. They show the corridors, hallways, elevation points and circulation paths of the building.

Legend:

Non Participating Spaces

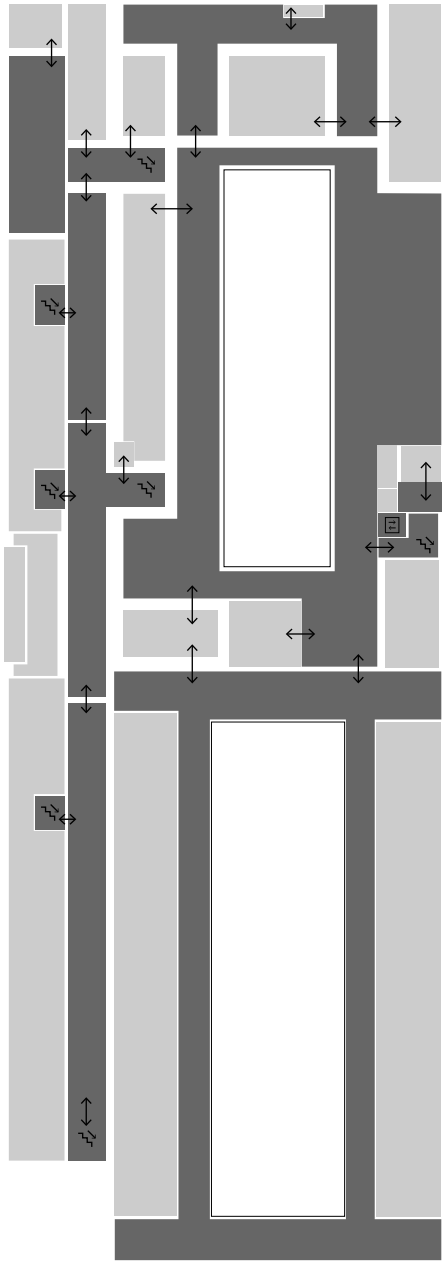
Common Spaces

Related Spaces

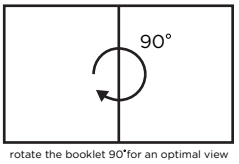
Direction of the Relation

Elevator

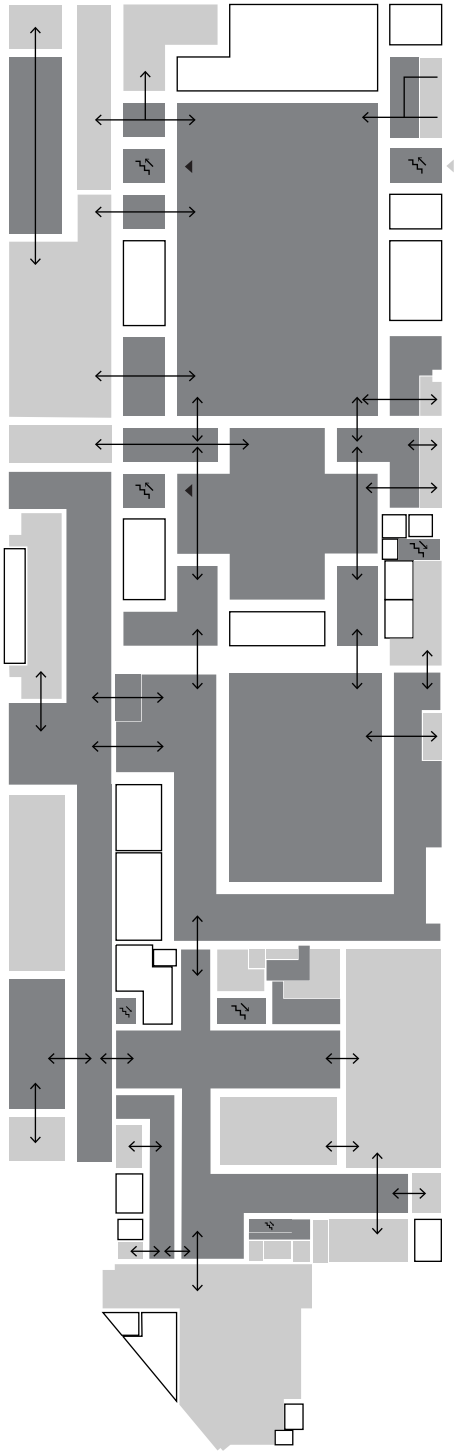
Staircase with Direction



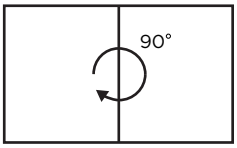
Basement - 1:750



rotate the booklet 90°for an optimal view



Ground Floor - 1:750



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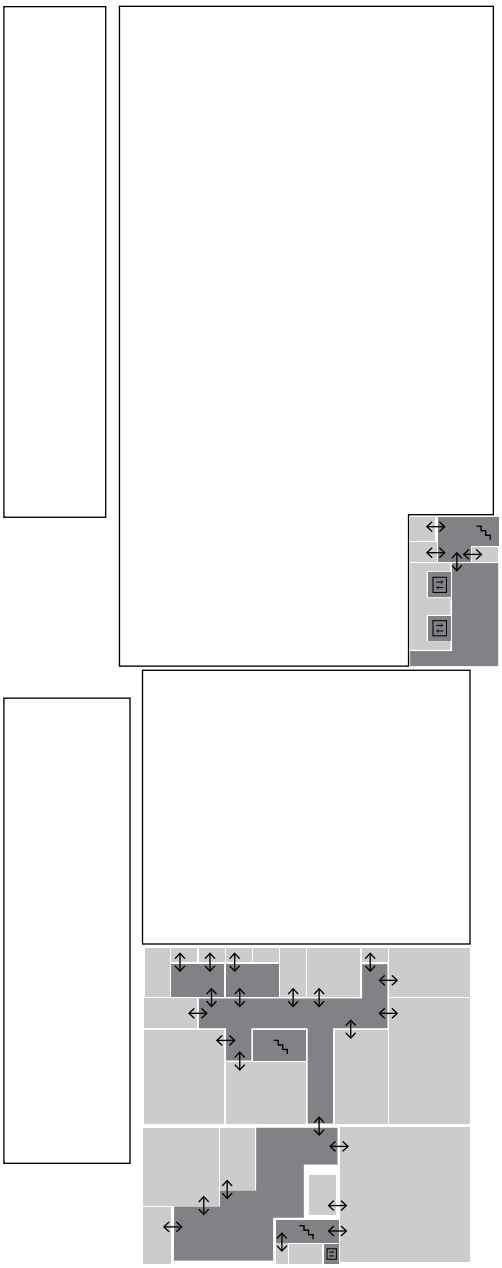
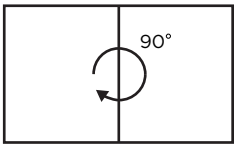


Silo's - 1:750



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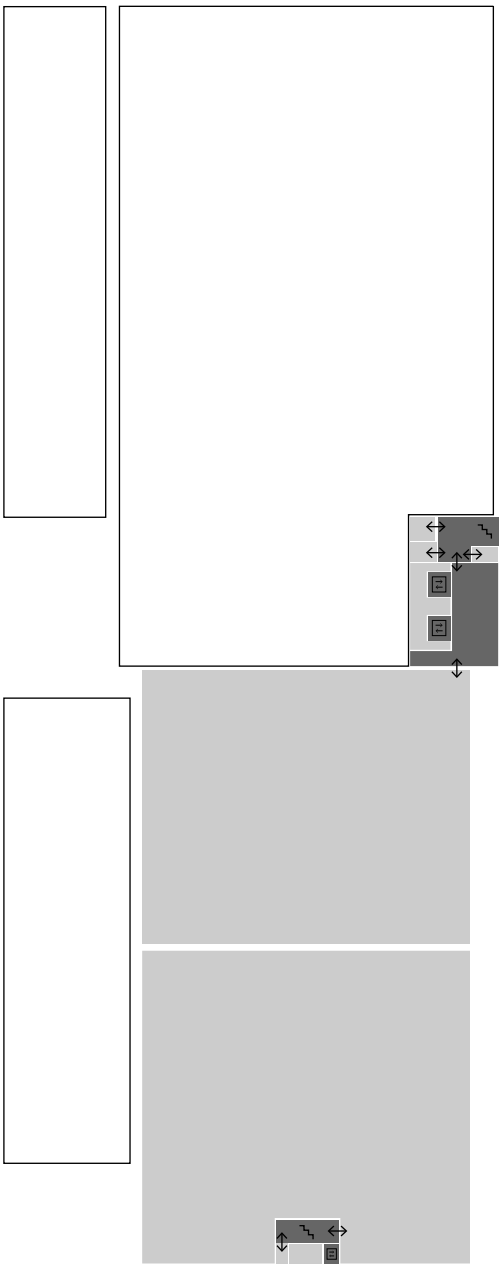
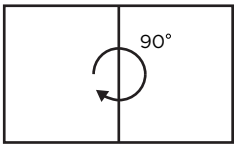


7th Floor - 1:750



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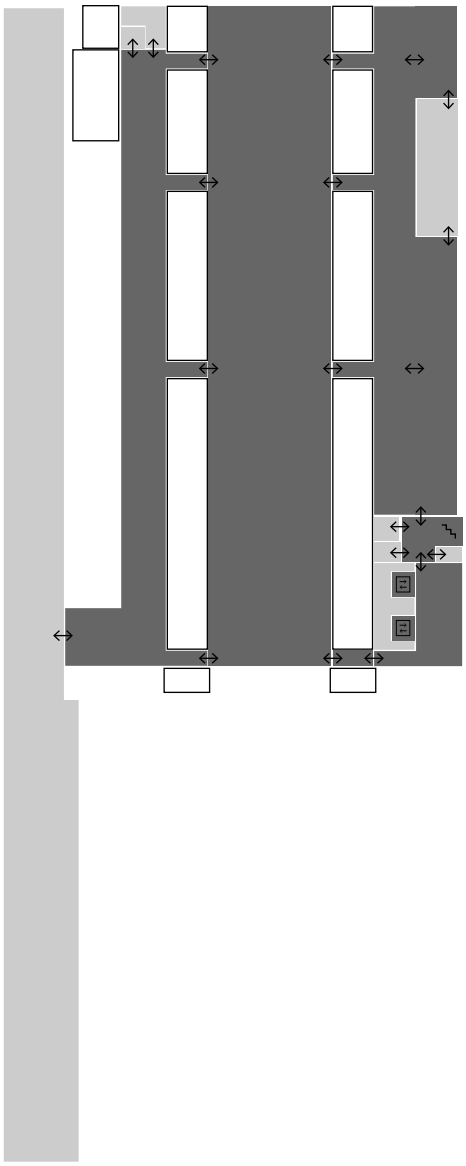
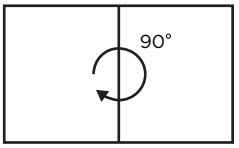


10th Floor - 1:750



rotate the booklet 90°for an optimal view

Summary

Summary

Overall summary of the analysis.

BODY

The Maassilo has a strong connection with the industrial development, its historical building processes and nearby urban developments. Revolutionary construction methods were used in the Maassilo's building phases, that resulted in impressive structures in the Maassilo. These visible structures are now considered as essential monumental. Another very important element is the grain elevators on the quay, that tell an essential part of the story of the harbour activity and the processing of grain.

In addition, the development of port industry and the Maassilo itself, caused the urban area to develop as well. This resulted in residential areas whose names of the neighbourhood and streets would refer to the Maassilo, strengthening its connection to the urban developments.

The Maassilo is a recognisable landmark in the city. The site of the Maassilo is easy to access with the current infrastructure. This is mainly because of the infrastructural development that took place during the industrial and economical development that started with the Maastunnel and the metroline.

The Maassilo complex consists of three connected buildings. Even though each building represents their own volume and time of history with their structure, the tripartition inside them is the same. They all have a ground and top floor which is accessible for people and the silo cells in between them. This was because, despite being build in different times that had different influences, the function remained the same.

This tripartition remained the same in the event function. The spaces on the ground as well the top floor flowed well into each other, because of the need of flexibility and efficiency of the workers and grain process in the past. This characteristic turned out to be beneficial for the function of events, since this function requires for large amount of people to flow smoothly/easily through the building.

ORGANS & SKELETON

The organs of the building can be divided into two categories, active and passive organs. The active organs are movement related, while the passive organs house functions like storage and office spaces. Both types of organs complement each other in keeping the building 'alive' and always need each other in order to let it stay 'alive'. This goes for both the historical silo function as the present event function, however not in the exact same way of using these organs.

One of the most important, and obvious, (passive) organs are the silo cells. They happen to have three functions in this building at once: they are the structure, the skin and silos. The silos make up the biggest part of the complex and are a barebone collection of different organs (silos) that make it seem like the building has an exoskeleton. This is one of the most crucial characteristics of the Maassilo that makes it able for the eye to observe the historical development of the silos themselves.

Furthermore, nowadays the silos are not used for their original purpose. Part of the cells have been modified in order to contribute to the ventilation requirements for the event function. However, this modification was not extreme and still allowed the silos to express their history.

The most important active organs are the grain elevators on the quay. These elevators made it possible for the Maassilo to keep it 'alive' and expand further. They have played a huge role in the historical development of the building and its area, which makes them very important elements that hold (unintentional) commemorative value to the site and city. Even now, when they are not used anymore, they remind of the historical activity, development and identity of the site and even the city.

In the past, on the ground and top floor of the complex were the spaces where people worked, and therefore these spaces had daylight. The distinction in this former function was clear, spaces for people had daylight and the ones for machines and grain did not. For the event function, spaces following the amount

of daylight seemed to have decreased, because of its requirements for soundproofing and controllable lighting. In all the functions the building has housed, seems to be a clear cooperation between function and daylight in which the presence of daylight follows the function.

VESSELS

The Maassilo was originally designed for the transport and storage of grain. During the different building phases of the complex, the main principle of the process of grain remained similar. The only difference is that throughout its development the process has been optimized.

Furthermore, the flows of people before and after redevelopment has drastically changed. In the past function the building had to accommodate approximately 70 workers, which was easily possible since the building had huge floor surfaces in relation to the amount of people in it. For the event function, on the other hand, the building had to accommodate approximately 6000 people in the same amount of available floor surface. The original floor plan seemed to obstruct the new function, which resulted in several columns being cut off in order to create more floor surface to properly, and safely, accommodate the new function and its estimated visitors.

SKIN

The architectural characteristics of the façade give away the historical function of the space behind it. The skin of the building in its materiality and appearance can be read as a book of its historical development. Also interesting is that most of the skin is also the structure.

ORNAMENTS

There is a logical amount of presence of ornaments in the complex, which was a result of the different architectural influences during the development of the Maassilo. The distinction and analysis of these ornaments give away the timeframe they were built in and under what architectural style and/or influence. These elements also contribute to the historical narrative of Maassilo.

SPATIAL SYSTEM

In the former situation, there was a certain logic and clarity in the spatial system. It was designed purely functional, because it was intentionally used as a machine. Half of the building volume was used for storage of grain and the rest was mainly used for internal transport and external distribution. In the current situation, the spatial system is fragmented into many different smaller spaces which makes it difficult to understand where u are in the building. The Maassilo in its current stae lacks an overall coherency and due to the fragmentation of spaces, the layers of time are more difficult to read. Also, only one third of the building volume is currently used. The large amount of unused volume with a relatively smaller amount of square meters, could eventually allow for designing large open spaces.

ORGANIZATION

Every floor plan contains a clear path and axis along or through clustered spaces. The path on the ground floor is clearly visible when standing in the actual spaces, however, in case of a crowded event this path may become less visible.

Furthermore, in the diagrams of both clustered organization and axial conditions, it is evident that all floors are characterized by a longitudinal path, and axial conditions, except for the tenth floor. This floor is characterized by a path and an axial condition that is perpendicular to the dominating longitudinal axis of the Maassilo, possibly because of the absence of the part of Stok that resulted in a shorter top floor plan.

SPATIAL RELATIONS

Noticeable in the Maassilo is the hierarchy between spaces. To clarify, the three open spaces on the ground floor dominate the composition of the floor plan as a whole. They organize the spaces surrounding them and

have clear pathways embedded in them, profoundly expressed through the sequence of these three spaces. Furthermore they are served by numerous spaces to facilitate them in accessibility and access to amenities, such as the bar and the sanitary facilities. The basement and 10th floor are also organized in a similar fashion. The basement is composed of spaces organized around the old grain machinery and the 10th floor is organized around the dance hall that serves as a common space between the north and the south of the floor. To conclude the spatial relations within the Maassilo are organized through hierarchy and through the accessibility of the common spaces that link them.

To conclude the summary, we attempt to answer the main research question: **How did the Maassilo transform from an industrial machine to a contemporary cultural platform?**
From the time the first building of the Maassilo complex was built, the complex kept growing in mass as well as technical processes. This was a result of growing demands of the building, due to the industrial and economic development. Over time, after reaching a peak in the activity of processing grain, the activity of this original function of the Maassilo slowly decreased. The building seemed extremely difficult to automate and adjust to the demands that kept growing. Because of this the function of the building went from processing and storing grain to just the storage of grain, and eventually to a location for events. In other words, it went from an industrial machine to a contemporary cultural platform.
This transition incorporated few elements of the present architectural and historical layers. These elements seemed to benefit the implementation of the event function, in the sense that they more or less covered some of the requirements of this function. Which can be seen as modification or usage of the DNA. Some of these covered requirements were, for instance, the fact that the building is over dimensioned and therefore could effortlessly accommodate 6000 people at once. Or that some spaces in the building had a dark atmosphere, which was needed for a club function in order to successfully implement controllable club/disco/theatre lighting.
Even though the latest transition to a club function seems fairly logical when you look at the requirements for modifications, there is no strong connection between the current elaboration of the cultural function and the historical value of the Maassilo.

Conclusions

Conclusions

CONCLUSION ARCHITECTURE

How do the different architectural and historical layers of the building and its area affect each other, and how do they work together?

The Maassilo is a complex building, with different historical, tangible and intangible layers. The location is in between the city centre, AHOY and the Kuip stadium, in the middle of Rotterdam's most cultural activity. It's also a landmark on a busy infrastructural node.

The most important aspects of the building are its structure and materialization, atmosphere, spatial organisation, the relationship with the harbour and Rotterdam's characteristic history. The spaces and the overall system were designed to be functional. All spaces are connected with each other in different ways, even though the building consists of separately built blocks, allowing one to read different layers of time. Most of the Maassilo now is empty space and bare structure with little daylight, which creates an atmosphere that is mysterious. However, the way that the spaces are now fragmented into a lot of different smaller spaces, with sometimes unclear routing, make the Maassilo transform from a mysterious and interesting place towards being a place that is difficult to understand and navigate through. Another very important matter, is that the building is never designed for people in the first place, but for storage. Now that the Maassilo is supposed to be for people, this creates problems with routing, daylight and a lot of inaccessible, unused space. These problems also pose opportunities; there are a lot more interesting spaces to explore in the Maassilo.

The Maassilo's architectural elements are ambiguous in different ways. The structure is also the façade and defines most of the spaces. There are architectural qualities which are also problems: for example the mystique of the building that can turn to unclarity in only a moment. An obligation to the architectural quality of the Maassilo is to strengthen the ambiguities that are specific for the Maassilo, i.e. the structure also being the façade and defining the 'feel' of the building. And to search for the right balance between mystique and orientation; spatial organisation and the overall coherence of the system; the historical machine and the contemporary requirements for the new users; the history of the site and Rotterdam and the relationship with the harbour in the future.

CONCLUSIONS BUILDING TECHNOLOGY

Which building techniques of the Maassilo contribute to its historical and contemporary processes?

The structure of the building consists of reinforced concrete in which the 'schijfwerking' of the silo walls played an important role as well as its fire resistancy. A large amount of these walls was present, which means almost any force could properly be led down to its foundation, since it contributed to its ability to withhold large amounts of weight. This characteristic, as well as its materials and the fact that the structure now is over dimensioned, made it possible to adapt the structure for future functions, while it was also the most efficient way and use of materials to construct in the time it was built.
Furthermore, some parts of the façade of the building seemed to consist of pumice stone, which is lightweight hollow concrete. The presence of this material can be clearly seen in the grid on the north-eastern façade. The dust of the grain that was processed in the past seemed to be highly flammable. In case of an explosion the pumice stone would pop out of the façade without causing the structure to disintegrate, making it a necessary addition to the construction. Nowadays this same characteristic remind of the past process of grain.

The present fixed and non-fixed elements/systems that contributed in the past processing of grain, are not used in the current cultural function. However, there is an overall increase in elements and systems. These were added in order to meet the requirements for the climate of the building that had to accommodate approximately 6000 people instead of the original estimation of 70 people. The presence of the historical as well as the contemporary elements tell a clear story of the development of the function of the building and its past and present processes. Important for the services of the building is the shift from the Maassilo being a machine for grain, to a machine for people.

CONCLUSIONS VALUE ASSESSMENT

How could the DNA of the building be defined and how does it affect the tolerance for change?

The chapter about the Historical Interpretation explains what we think is the DNA of the Maassilo and why. The DNA of the Maassilo from our point of view incorporates the (in)tangible memories and experiences of past processes within and around the Maassilo. The characteristics of the elements that contribute to this can positively influence the likeability of implementing a certain cultural function, depending on what this function is. We think that in order to implement a cultural function, the DNA of the building should not be modified, but strengthened. Meaning, that the new cultural function and the history of the building should embrace each other rather than flow past each other.