CULTURAL VALUES

MANUTENCAO MILITAR COMPLEX
The Milling & The Bakery

CONTENT

Image 1: The Milling

Image 2: Aerial view from large Silos

INTRODUCTION

The Manutenção Militar Complex (MMC) is situated along the Tagus river just outside of the city centre of Lisbon in the 'freguesia' of Beato. Within the industrial complex they produced food, uniforms and other goods for the Portuguese Army. Whilst the Portuguese Army reached 200,000 men in the 1960s, it is now reduced to 20,000 active soldiers. This meant that the factories of the MMC complex finally closed leaving a large industrial area that needs to be transformed for future use. The whole MMC complex can be divided into three parts but for the Graduation Studio Lisbon we focus on the southern part closest to the river. This part of the MMC contains large factories where flour was milled and large amounts of bread and pasta were produced. Besides these functions the MMC also had a social function to the neighbourhood with a local supermarket and housing for families. Within this industrial complex we need to research the cultural values of the MMC and our chosen buildings not only to understand the challenges of working with industrial heritage but also to create a transformation framework as a guideline throughout our graduation.

The graduation project started with the DOCOMOMO workshop and conference 2016 in Lisbon introducing the site to the students and simultaneously providing tons of information and a thriving first impression. Personally, during the first site visit I was overwhelmed by the immense buildings and huge industrial scale of the site, the impressive ovens of the Bakery and the vast amount of machinery. Eventually I chose the buildings in the middle of the MMC, the Milling and the Bakery, as I personally feel these are the heart of the whole complex and provide a complex design challenge combining cultural value, design and technique. These buildings 'have it all': a visible transformation over time, aesthetic features, large silo structures, different levels, spaces overpowered by machinery, hall-type spaces and ending with a strong landmark type. As these buildings are situated in the middle of the complex they immediately influence all the other buildings within the MMC which is why I want to use it as an incubator for the rest of the complex: starting from within. Thus the complex design challenge of the Milling and Bakery will be the subject of my graduation project starting with its cultural values. My overall focus will eventually be regarding the Milling.
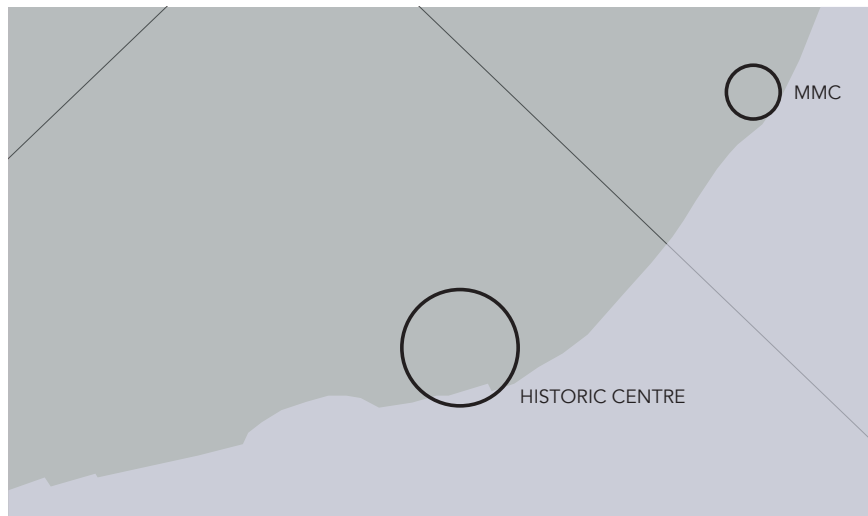

Image 3: Location MMC in Lisbon   1:75.000
(Architectural Analysis Middle Group p. 32)

Image 4: Location of the Milling and Bakery within the MMC 1:10.000
(Architectural Analysis Middle Group p. 15)

METHODS

What is cultural value and how do we value it?
According to an online dictionary cultural value is "the commonly held standards of what is acceptable or unacceptable, important or unimportant, right or wrong, workable or unworkable, etc., in a community or society" (http://www.businessdictionary.com/definition/cultural-values.html). This implies that something has cultural value following from a common consent that a community or society finds it important and therefore requires safeguarding for the future. The difficulty is that these values are not necessarily quantifiable and thus defining what actually has cultural value and in which circumstances is challenging but crucial for designing with cultural heritage. These circumstances are important as something might not be valuable on its own but can be a valuable part of something bigger.

"The whole is more than the sum of its parts"
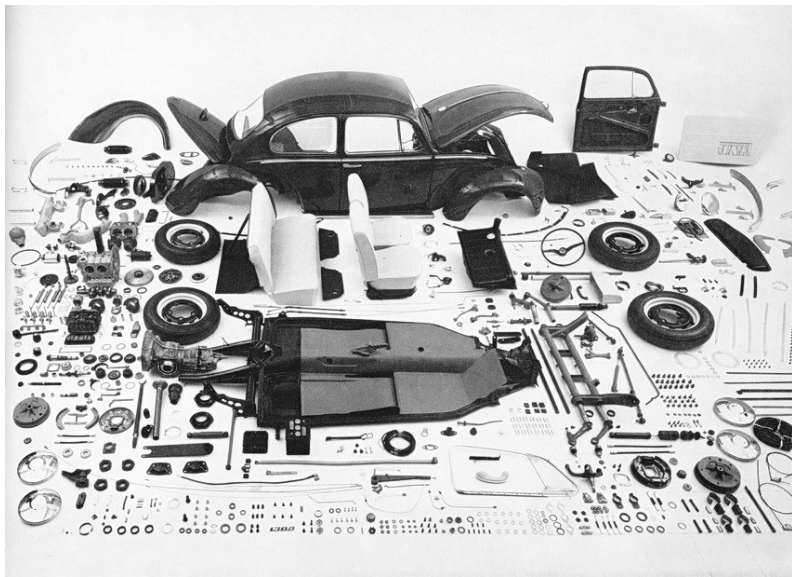- Aristotle -

Image 5: Disassembled beetle: separate they mean nothing but together they form an iconic beetle (lecture Nicholas Clarke)

There are multiple theories about the different cultural values and how we view cultural heritage. For this graduation project a new tool was designed to define the cultural values of a building or site. This tool is based on a combination of the theories of Alois Riegl and Stuart Brand. To explain the tool the theories of Riegl and Brand will very briefly be discussed. For further reading on theories of cultural value I recommend 'Het erfgoeduniversum' by Marlite Halbertsme and Marieke Kuipers, 'How buildings learn' by Stuart Brand, 'Assessing the Values of Cultural Heritage' a research report by The Getty Conservation Institute containing multiple essays and a PhD thesis 'Waardestelling in de Nederlandse monumentenzorg 1981-2009' by Charlotte van Emstede.

ALOIS RIEGL
Alois Riegl was an art historian from Austria who, around 1900, developed a theory about the different cultural values. Riegl's theory was centred around the psychological aspects of the experience of the individual with the heritage site or building. These psychological aspects can change over time and so will the cultural values.
Consequently Riegl developed a dialectic system of different cultural values which means that each value type has its counter value. For this system he made a distinction between 'memory values' and 'present day values'. In image 4 the values of Riegl are presented.

Memory value	Present day value
1. Age value	1. Use value
2. Historical value	2. Artistic value
3. Commemorative value	a. Newness value b. Relative aesthetic value

Image 6: Value system of Riegl

Memory values are according to Riegl the most important values as they are not influenced by the psychological aspects of the time of assessment.
The memory value consists of the age value, historical value and commem-

orative value. The age value describes the value of actually seeing the age in the deteriorated parts of the building, the 'wrinkles', the parts that show it is old(er). The historical value describes the value of the building of the moment it was constructed, so the parts that show this time of construction. In contrast to the age value the building can not show any form of deterioration. Last of the memory values is the commemorative value which describes the value of the memory of a certain place/moment/person in time which goes beyond its own historical context.

Besides the memory value, Riegl describes the present day value which embodies the values according to the time of assessment. These values are the use value and the artistic value. The use value describes the value of the building meeting the functional requirements. The artistic value can again be separated into two values: the newness value and the relative aesthetic value. The newness value describes the appearance of an object as people tend to like things better if they look 'new'. The relative aesthetic value on the other hand describes the value of an object according to the current aesthetic views which accidentally coincide with the aesthetic views of the past. Therefore these values differ greatly over time. (Halbertsma & Kuipers, 2014, p. 55-76)

STEWART BRAND

Another theory about buildings is defined by Stewart Brand. In his book "How buildings learn" from 1994 he describes his views on the different layers of a building and how these layers age and change at different rates, forcing adaptation and alteration or replacement.

These layers can be described as layers of permanence and result in Brands "Six S's" theory consisting of: Site, Structure, Skin, Services, Space Plan and Stuff. With each layer having its own lifespan as changes are made due to weathering or fashion.

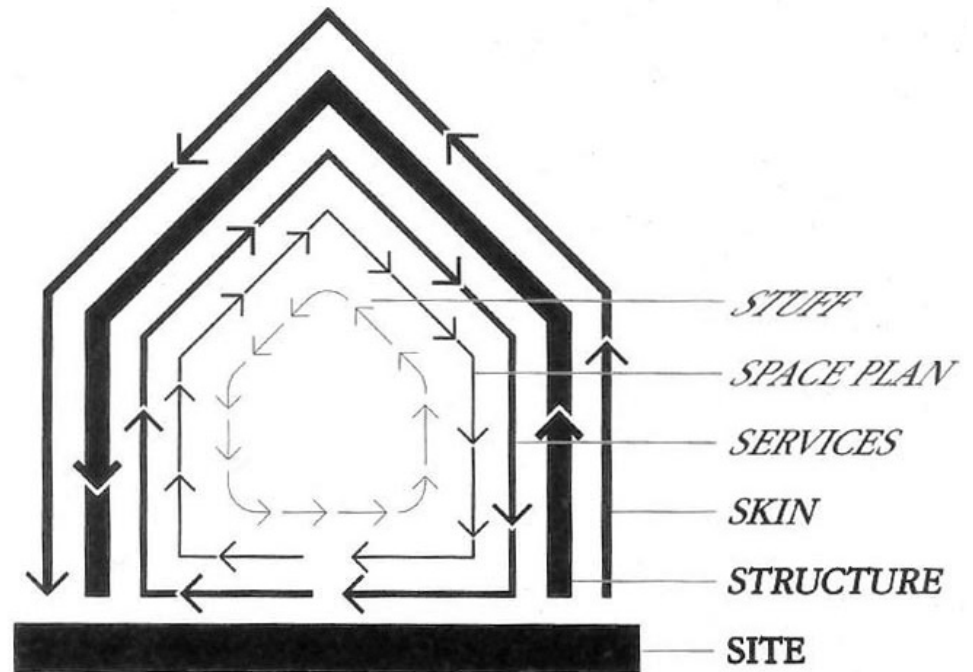| Site	- Geographical setting, location	- Eternal
Structure	- Foundation, load bearing elements	- 30 to 300 years
Skin	- Exterior surface	- 20 years
Services	- Wiring, plumbing, HVAC, elevators	- 7 to 15 years
Space plan	- Interior layout	- 3 to 30 years
Stuff	- Chairs, desks, pictures, lamps etc.	- daily to monthly

Image 7: The Six S's theory of Stewart Brand show the layers of a building and the hierarchy according to the rate they change over time. (Brand, 1994, p. 13)

With these many changes over time Brand argues that buildings should be designed with unanticipated future changes in mind and thus leave room for flexibility and ease of adaptability.

"All buildings are predictions. All predictions are wrong"
- Stewart Brand -

This quote of Stewart Brand underlines again that we can not predict what will happen in the future, what the building will be used for. So we should design buildings keeping the changing pattern of the six S's in mind.

THE VALUE MATRIX
The tool used for this Graduation Project is called the Value Matrix. In this matrix the cultural values of Riegl are shown on one axis and the building layers, the six S's, of Brand are shown on the other axis.

At the Riegl's axis the conflict and nostalgia values are added. These values are described in 'Het erfgoeduniversum' by Marlite Halbertsme and Marieke Kuipers. The conflict value, as a present day value, was argued by the art historian Gabi Dolff-Bonekamper. According to her not only the aesthetically pleasing parts of an object are of importance but also the more politically or socially charged objects. Besides, as already mentioned, the aesthetic values change over time. The nostalgia value, added by Halbertsma and Kuipers as a memory value, describes the idealised past and can be seen as the opposite of the conflict value. It is a desire to a hassle-free past. At Brands axis two more S's are added: social and story. These layers describe, in contrast to Brands S's, the intangible values of a building or site. This could be the story of what happened at a certain place or the social importance of an object or place.

Image 9: Filling in the Matrix

	SITE	STRUCTURE	SKIN	SERVICES	SPACE PLAN	STUFF	SOCIAL	STORY
AGE	■							
HISTORICAL			■					
COMMEMORATIVE					■	■		
ARTISTIC				■				
USE								■
NEWNESS		■						
CONFLICT	■				■			
NOSTALGIA								■

As already mentioned cultural values are not necessarily quantifiable which makes it harder to determine which value is most important or relevant. To determine the importance of the values a hierarchy can be added to the matrix by encircling the boxes.

Image 8: The Value Matrix

	SITE	STRUCTURE	SKIN	SERVICES	SPACE PLAN	STUFF	SOCIAL	STORY
AGE								
HISTORICAL								
COMMEMORATIVE								
ARTISTIC								
USE								
NEWNESS								
CONFLICT								
NOSTALGIA								

Image 10: Hierarchy in the Matrix

	SITE	STRUCTURE	SKIN	SERVICES	SPACE PLAN	STUFF	SOCIAL	STORY
AGE	□							
HISTORICAL			□					
COMMEMORATIVE					□	□		
ARTISTIC				□				
USE								□
NEWNESS		□						
CONFLICT	□				□			
NOSTALGIA								□

The Value Matrix is used by filling in the boxes of the matrix, by drawing and/or text, and help uncover all the cultural values of a building or site. This does not mean that every box needs to be filled in. Only the ones where cultural value is found.

If necessary more values can be added to the matrix. It is important to remember that the Value Matrix is a tool to identify the cultural values and so is not an end product in itself. It is still important to clearly describe the cultural values and what we want to take into the future.

SUZANNE FISCHER VALUE MAP
Besides the Value Matrix another method will be used to determine the cultural value of the chosen buildings and site, the so called Suzanne Fischer Map. Suzanne Fischer is an architect who conducts building history research for e.g. architects, municipalities or private parties.

Her method comprises a 'traffic light system' which shows a chronological evolution map. With this system red means that it has a high historical value, yellow means it has positive historical value and green means it has the least historical value. This map does not mean that the red part must be kept and the green part can be demolished! It only shows the evolution through time by date.
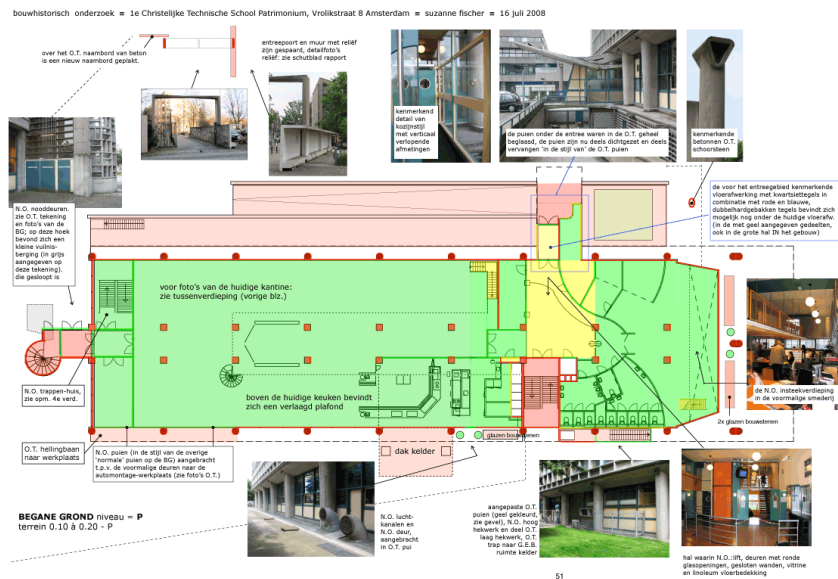
Image 11: Suzanne Fischer map of the Technical school of Amsterdam (lecture Hielkje Zijlstra - www.suzannefischer.nl)

In other building history researches a different colour-code will be managed: blue (high value), green (positive value) and yellow or sometimes red (indifferent value). For this graduation project the Fischer 'traffic light system' will be used as the other colours might be confusing.

Image 12: First floor Bakery

GROUPWORK

For the Analysis of the site and buildings we worked in groups of four students. Our group, the Middle Group consisted of Amela Rasidkadic, Guido Martin, Ruben Klinkenberg and myself.

We focused on the Milling and the Bakery which are also the focus buildings for my graduation project. For our research we made a thorough Architectural and Technical analysis but the groupwork was also used for our Cultural Values assessment.

Value Matrix Site Middle Group

THEMES

- Character
- Layering
- Memory

	SOCIAL	SURROUNDINGS	STORY	STUFF	SPACE PLAN	STRUCTURE	SKIN	SITE
AGE		- Remains of Palace - Abandoned Houses	Older buildings indicate growth, connection with production story			- Carbonation		- Morphology
HISTORICAL	- Support for military and their families - Employment	- Agriculture - Connection to river - Tram connection	- Support for military and their families - Employment	- Machines from different times - Layers - Additional roofs (shed) - Connections between buildings: rail/pipes	- Orientation to water: unlimited spacial experience	-Layering construction type roof/bearing structure	- Layering wall - Interaction supermarktet	- Exclude outsiders -Oldest part of Lisboa -Industrial development
ARTISTIC		- The architecture of the convents are special in their environment		-Unique machines	- Sightlines - Grand scale of silo's and 200m building	- Rythm construction - Silo as landmark -Entrancehal bakery	- Coloured façades	
COMMEMORA-TIVE		The name Beato reminds of a better time	- Support for military and their families - Employment	- Support for military and their families - Employment			- Convent to Industrial	The name Beato reminds of a better time
USE		Residential & Vacancy & Industry		- Shade from sheds	Function as machine: Pragmatic	- Carrying capaciy - Solid/heavy - Good condition	- Exclude outsiders	
NEWNESS		Greatness of the global harbour	Older buildings indicate growth, connection with production story	- Following the latest technology, "anti-conservative"				- Ground taken from the sea
CONFLICT		Residential vs. Vacancy vs. Industry	Dictatorship vs. Employment		Industry vs. Rustic character	"new" structures in "old" envelope		- Identity crisis BEATO - Vacancy
NOSTALGIA	The memory of working together in the factories	The name Beato reminds of a better time	The memory of working together in the factories					The name Beato reminds of a better time

For the start of our Groupwork assessment we used the Value Matrix. With four people this meant a discussion on what each of us found valuable and why. This was helpful as we could use this Value Matrix for our personal assessment as well.

Personally I did use some of the values found within the group but I did not consent with all the values. Finally we made two reports, one on the site scale and one on the buildings scale.

Value Matrix Buildings Middle Group

THEMES
- Character
- Layering
- Memory

	SOCIAL	SURROUNDINGS	STORY	STUFF	SPACE PLAN	STRUCTURE	SKIN	SITE
AGE		- Decay pavement - Carbonation concrete - Rusty metal -De-lamination plaster				- Carbonation concrete - Bad condition "in-between building"	- Carbonation in facade - Damage caused to bad details water-drainage	
HISTORICAL	- Working environment - Mono-functional	- Layering pavements - Change public space (the relation to river) - Start industrial process and connection to other buildings on complex	- Support for military and their families - Innovation of production process, growth of the army	- Machines from different times - Layers - Connections between buildings: pipes	- Form follows function - Diversity in space	-Layers construction type - One silo inside and one silo outside the original building volume/envelope	- Different types windows - Different types roof - Forms follows function	Built on new ground
ARTISTIC		- The artistic detailing of the power-plant		- Old tiles bakery	- Determined by machines	- Ornamentation cast-iron	- Front facade bakery - New is built the old grid - Ornamentation	
COMMEMORA-TIVE			- Tiles tell story of old bakery	- Keeping the old ovens			New buildings on old grid	The old convent
USE			- Reduction army, closing of the MMC	- The machines seem to still work when active		- Carrying capacity - Good condition	- Solid: keeping heat out - Small openings: keeping the sun out - Natural light	
NEWNESS		- Greatness industrial scale - Good preservation		- Machines in good condition			- Plaster as make-up	
CONFLICT		Positive vs. Negative History			Vertical process vs. Horizontal spaces	The exterior "hides" the different layers, where the interior reveals them		
NOSTALGIA	Employment							

Image 13: Aerial view from Milling

VALUE MATRIX SITE

	SITE	STRUCTURE	SKIN	SPACE PLAN	STUFF	SOCIAL	STORY
AGE							- Older buildings indicate growth, connection with production story
HISTORICAL	- Connection to river		- Closed off		- Additional roofs (shed) - Connections between buildings: rail/pipes	- Support for military and their families - Employment	- Support for military and their families - Employment
COMMEMORATIVE			- Convent to Industrial		- Support for military and their families - Employment		- Support for military and their families - Employment
ARTISTIC		- Silo and Flower Tower as a landmark		- Sightlines - Grand scale of Silo's and buildings			
USE			- Closed off	- Pragmatic spaceplan adjusted to its use - Define streets and squares			
NEWNESS							- Older buildings indicate growth, connection with production story
CONFLICT	Residential vs Vacancy vs Industry	- 'New' structures in 'old' envelope		Industry vs Rustic character			
NOSTALGIA						- The memory of working together in the factories	

THEMES

- Character
- Process
- Memory

THEMES

As mentioned the Value Matrix is a tool which can be used to unravel the cultural values. While filling in the matrix it is noticeable that some found values centre around the same theme or are basically the same or only slightly shift in focus. For the site of the Manutencao Militar Complex three themes were found namely: character, Process and Memory.

CHARACTER

Within the theme of character a lot of values are found. The word 'character' can de described by multiple definitions like: "the aggregate of features and traits that form the individual nature of some person or thing" (http://www.dictionary.com/browse/character), or "the particular combination of qualities in a person or place that makes them different from others" (http://dictionary.cambridge.org/dictionary/english/character). Or my personal favourite:

char·ac·ter (kăr'ek-ter):
The distinguishing nature of something.
(http://www.thefreedictionary.com/character)

It is this distinguishing nature of the place that is so hard to define in words or values as what we want to take into the future. What makes the MMC the MMC an how do we keep these essential qualities so it will not loose its character? As found in the descriptions a character can be made up of a combination of qualities or in this case values. The found character values will be described and explained by the values of Riegl and specified by the building distinction of Brand.

Historical - Skin

- Closed off

The site, being a military complex, has always been closed off to its surroundings. This is still visible in the walls, facades, gates and guardhouses surrounding the MMC which are still present. The closed off site can therefore be seen as a character value of the MMC.

Image 14-15-16: Closed facade - Wall - Guard house
(Google maps with own editing.)
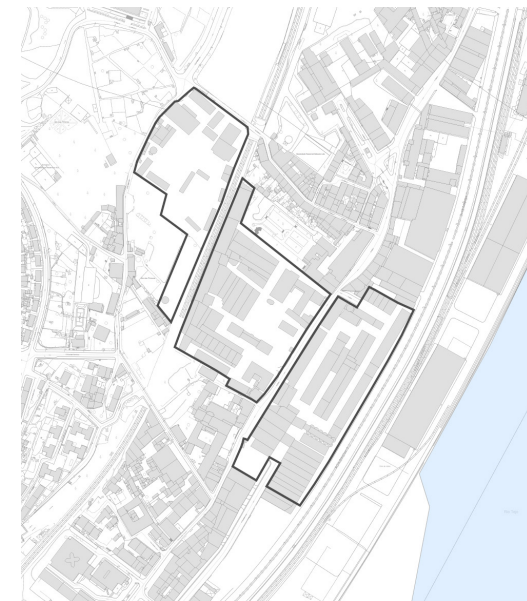
Image 17: Border of the MMC 1:10.000
(Own image based on Google maps)

Artistic - Space plan

As the site is an industrial complex the scale of the buildings and open spaces is also of an industrial size, which is large. This big scale is characteristic for the MMC as it underlines the industrial atmosphere.

Image 18-19: The big scale of the Silos and the 200m length of the Pasta factory.

Another aesthetic aspect of the space plan are the sightlines in the streets ending with a industrial structure: the Silo or the Watertower. This ending of the street gives a clear direction to the site.
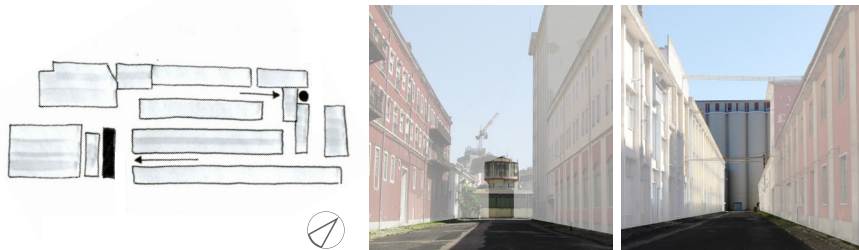
Image 20-21-22: The sightlines at the site ending with the Silo or the Watertower. (left image 20: Groupwork Cultural Values p.5)

Artistic - Structure

Two landmark structures can be found on the MMC site, namely the Silo and the so called Flour Tower. The Silo is better visible from outside the MMC but viewed from higher up the hill both structures are easily visible. The structures are approximately 35m high and have a distinct appearance. The Silo is a high closed structure with circular shapes and the Flour tower has a strong concrete grid facade both acting as a landmark or placemaker for the MMC. Although the height of the buildings is pure functional for the production process they, unintentionally, became the landmarks for the MMC.

Image 23-24: The Silo and the Flour Tower

Image 25: The Silo (right) and Flour Tower (left) from outside the MMC.
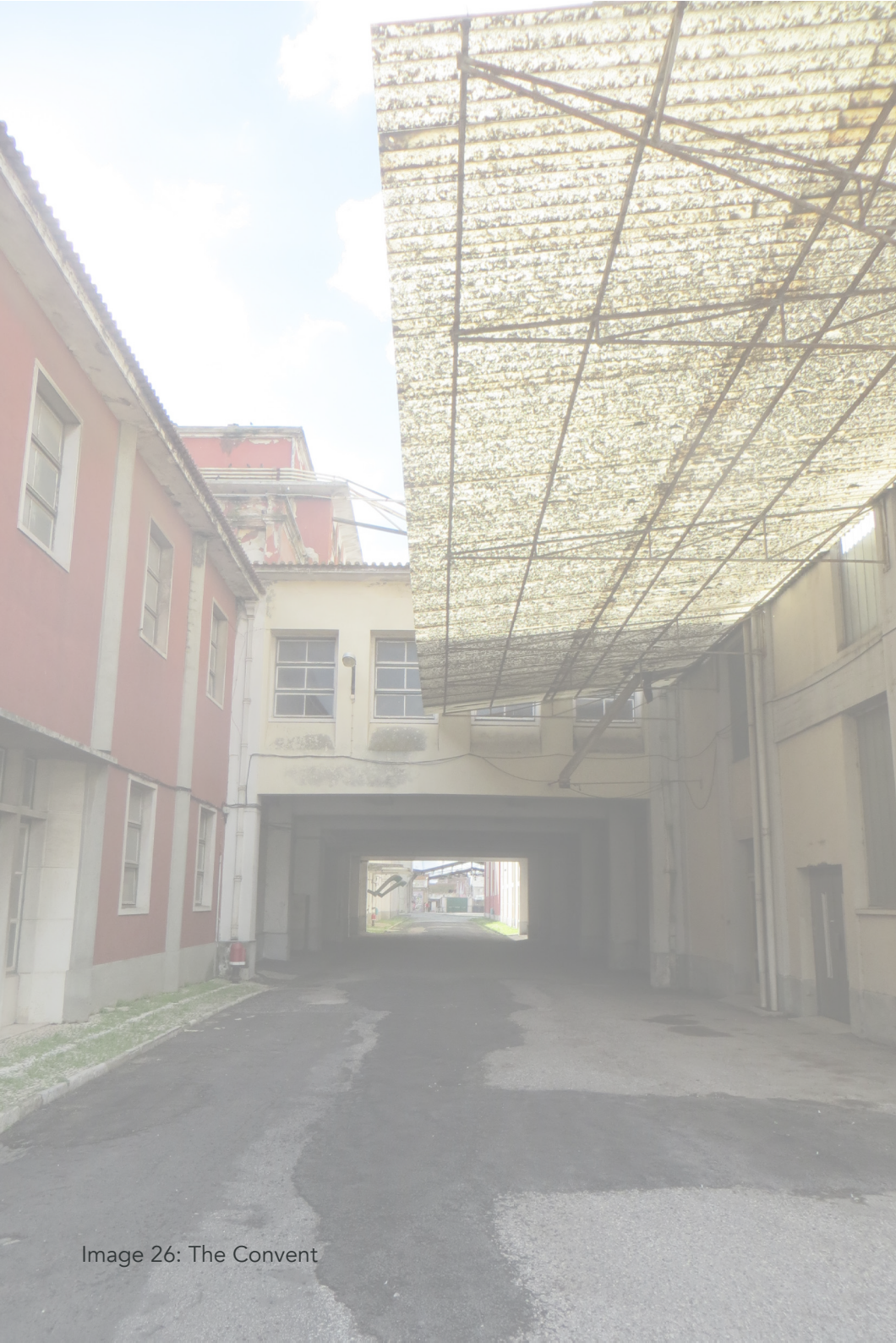
Image 26: The Convent

Use - Space plan

- Pragmatic spaceplan adjusted to its use
- Define streets and squares

The MMC is an industrial site so everything evolved around the production process and changes were made for pragmatic reasons. The space plan also responded to this pragmatic character and is thus set up in a way that it was easy for the trucks to move around and pick up the goods from the buildings. In the middle we identify a series of streets and on the sides open space which can be referred to as squares.
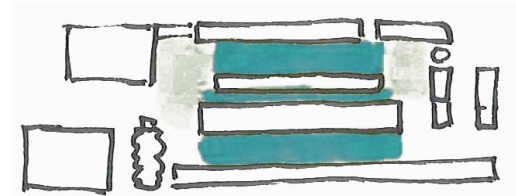
Image 27: Streets and squares identified

The streets and squares differentiate from each other in character enabling it to define more specific characters to each street or square. Further research was conducted to describe the overall character with one word. (For a more detailed analysis of defining the character see the architectural analysis of the middle group p. 95-105.)
For the streets we identified: the industrial street between the Pasta factory and Bakery, the intimate street between the Bakery and the Milling and the rustic street between the Milling and the Convent.
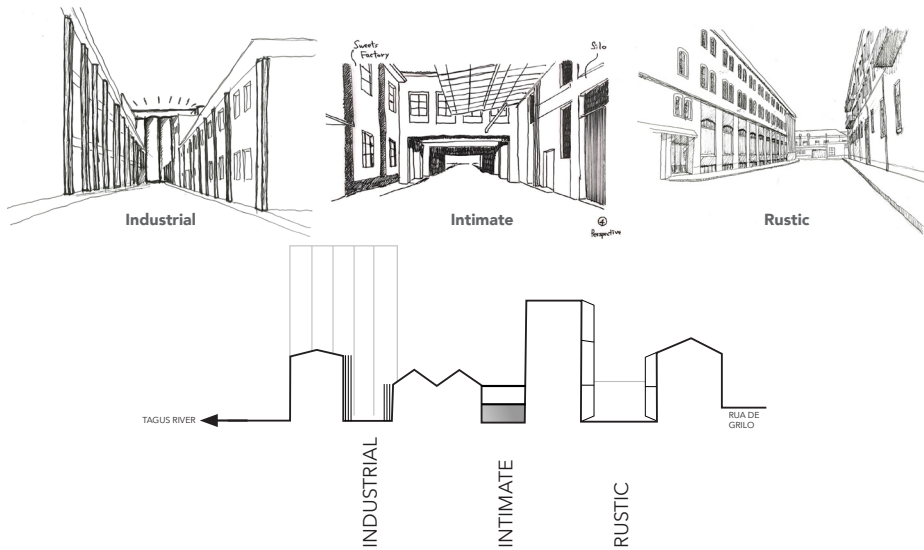
Image 28: Different characters of the streets
(Architectural Analysis Middle Group p. 101)

For the squares we identified the square on the side of the Silo as diverse and the square on the side of the Flour tower as intimate.
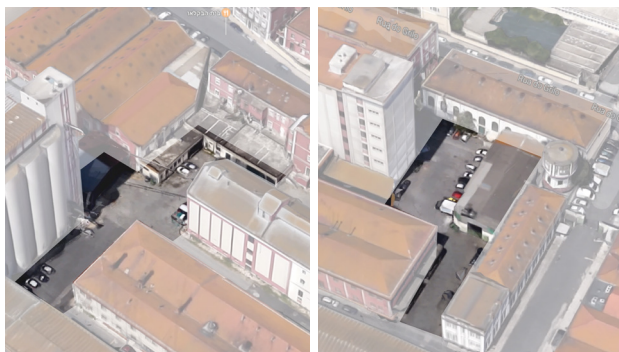
Image 29-30: The two squares (Google maps with own editing

When transforming the MMC the character of the site must be taken into account. How to incorporate the defined characters in the newly shaped spaces?
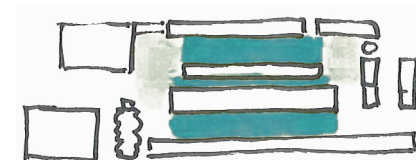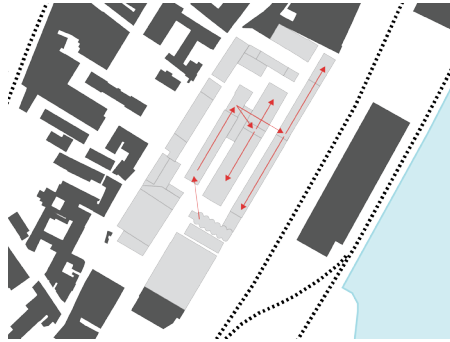
CHARACTER

CLOSED OFF
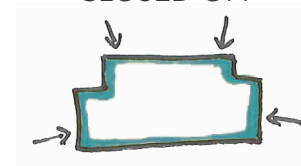
BIG SCALE
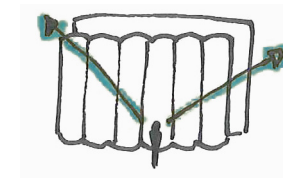
LANDMARKS
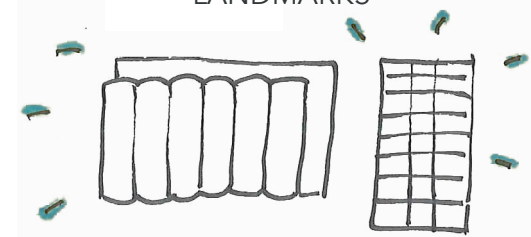
STREETS AND SQUARES

PROCESS

The Manutencao Militar Complex was an industrial site which existed purely to produce its goods for the army. Therefore there are values found within this pragmatic industrial production site which will get the theme of Process referring to the production process.

PRODUCTION PROCESS
The grains enter the site at the large silos. From there the grains are transported to the Milling building in the centre where the grains are milled into flour. The flour is then transported to the different factories to make the final products of bread, cookies and pasta.

Image 31: The production process from1970 till 2015 1:10.000
(Architectural Analysis Middle Group p. 115)

Historical - Site

- Connection to river
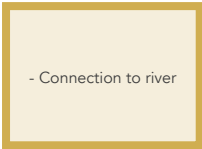
From a historical point of view the MMC always had a direct connection to the water as the goods were directly transported by boat. Even before the MMC was established the water used to come all the way up to the convent, so the MMC is created on man-made land. As the port activities grew the river got increasingly more disconnected from the MMC.
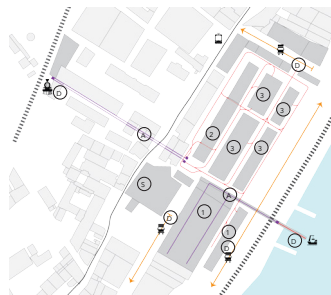
LOGISTICS

D: Distribution, import

1: Warehouse, storage of products

2: Milling, the process of changing wheat into flour.

3: Production, the flour and other ingredients are combined to create food.
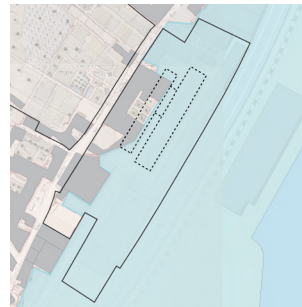
A: Aerial transport
D: Distribution, export
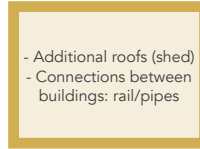S: Supermarket

──── Inner logistics
──── Road connection
▪▪▪▪ Train

1:10.000

Image 32-33: Logistics map 1950s - map of 1855/58 showing the old waterline
(Architectural Analysis Middle Group p. 114)

Historic - Stuff

- Additional roofs (shed)
- Connections between buildings: rail/pipes

Throughout the site there are several connecting elements like pipes and rails. These elements connect the buildings via a product line which means that the overall process of the building can be discovered just by carefully looking at the connections between the different buildings. Next to the connections there are some additional roofing structures which also give an indication of the production process as these where the dry places where products could be delivered.

Image 34-35: The connective elements - pipes
(Groupwork Cultural Value p.9)

Image 36-37: A connective element ending in a silo (showing that it was used for products) and additional roof structures
(Groupwork Cultural Value p.9)

Age & Newness - Story / Conflict - Structure

- Older buildings indicate growth, connection with production story

- 'New' structures in 'old' envelope

The buildings of the MMC clearly show a transformation in time. There are old buildings like the convent and relatively new structures like the Silo. The newer parts are sometimes just additions to older buildings as can be seen in between the Bakery or the end of the Milling building (with the Flour Tower and silos). These additions or expansions show how the production process flourished and expanded over time and reveals also the importance of the Portuguese army, even though it is debatable if the glorification of the Portugues army with their role in colonisation and surpression should be seen as something positive.
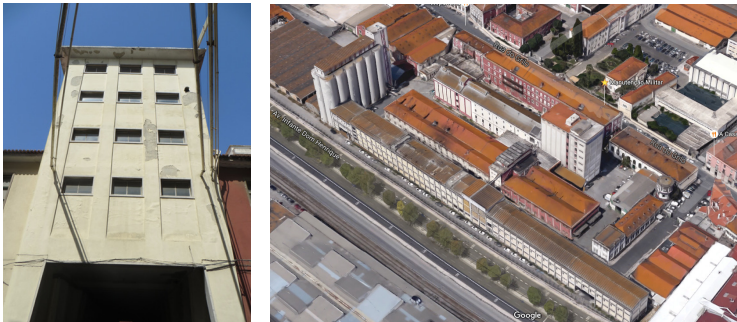
Image 38: The additional small silo between the bakery and cookie factory
Image 39: Aerial view showing the different styles of the buildings as they were constructed in different times.
(Google Maps)

PROCESS

CONNECTION RIVER

PRODUCTION SITE
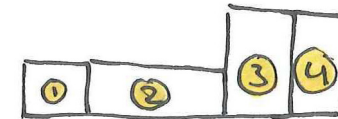CONNECTING ELEMENTS
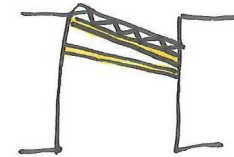
LAYERING BUILDINGS

Image 40: The Convent

MEMORY
The last theme is all about memory which is something intangible but nevertheless important to understand the place and to complete the story and feel of the Manutencao Militar Complex. What did the MMC mean to the people, its workers and the neighbourhood?

Historical - Social
Historical - Story
Commemorative - Stuff
Commemorative - Story
Nostalgia - Social

- Support for military and
their families
- Employment

- The memory of working
together in the factories

The Manutencao Militar Complex was an industrial site where a lot of people from Lisbon worked. Especially as the Portuguese army grew more and more products were needed and the MMC expanded as well. Nowadays the site is closed and very quiet with the absence of workers and the noise of the machinery. During the DOCOMOMO workshop and later travels to Beato we asked the local people if they knew about the Manutencao Militar Complex and surprisingly few people remember the industrial site. Especially the younger generation does not know about the site whilst older people better recall the activities. To give an intangible value for this phenomenon we could value this former productivity of the complex even though it is not remembered as such by everyone.
Another intangible value of the complex can be found in the support from the complex towards the military families and employers. The supermarket of the site was for the families of people who were part of the army. And so the people worked at the factories but also got something in return. The site therefor had a social value to its people and neighbourhood.

Image 41: The Supermarket
(Groupwork Cultural Value p.9)

Image 42: Workers of the MMC
(DOCOMOMO Archive photographical survey)

MEMORY
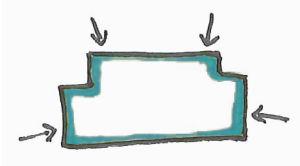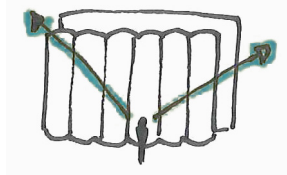
FORMER PRODUCTIVITY COMPLEX
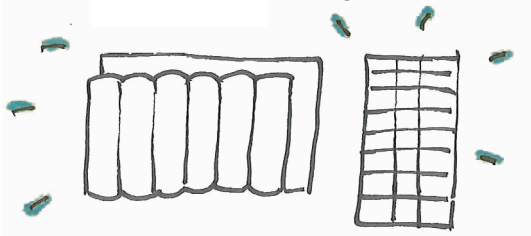
FORMER SOCIAL FUNCTION

MMC

CONCLUSIONS SITE

CHARACTER

CLOSED OFF

BIG SCALE

LANDMARKS

STREETS AND SQUARES

PROCESS

CONNECTION RIVER

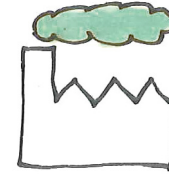### PRODUCTION SITE CONNECTING ELEMENTS
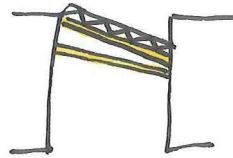
LAYERING BUILDINGS
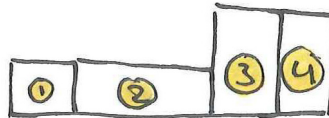
MEMORY

FORMER PRODUCTIVITY COMPLEX

FORMER SOCIAL FUNCTION

DILEMMAS
The found Cultural values are the essence of that what makes the MMC the MMC, and thus the values we want to take into the future. When transforming a site these values can cause for the so called 'dilemmas' as the values might be contradicting with what is desired for future use. For the MMC there are two dilemmas found:

CLOSED OFF SITE   BIG SCALE
VS   VS
CONNECTING   HUMAN SCALE

First of all we value the closed off character of the site which relates to its military background. However for future use the MMC should be accessible and connected to the neighbourhood as well as embedded in the surrounding urban fabric. The question remains: where and how to open up the MMC to maintain its closed off character while being accessible to its surroundings?
The next value we found was the 'big scale' character which underlines the industrial size of the MMC. This big scale required for the industrial function is in contrast with the scale required for people living there, the human scale is missing. Window frames are too high, making it impossible to look inside, and overall the spaces are over-dimensioned everywhere. This scale is impressive but it needs to be liveable as well. The question which arises is: how to incorporate the human scale without losing the overall big scale character? This is also an opportunity to play with the changes in scale within the design.

So in conclusion we value the character, process and memory of the MMC.

To maintain the character of the MMC the site has to:
- Have a closed off feeling while being connected (dilemma).
- Maintain its big scale but also introduce a human scale to make it liveable (dilemma).
- Keep its landmarks of the Silo and Flour Tower.
- Maintain the spaceplan of different streets and squares.

To maintain the process of the MMC the site has to:
- Reinstate a connection with the river (important: a connection does not have to be physical, a visual connection is also a connection).
- Keep its connecting elements on the site.
- Show the layering of the different building types over time.

To maintain the memory of the MMC the site has to:
- Reinstate the former productivity of the site. (important: this does not mean producing goods but being a place where the community goes to, an active place.)
- Reinstate the former social function of the site. (meaning: bring the social factor of the site back, what can the MMC do or mean for its surroundings?)

Image 43: Machines first floor of the Milling (Hielkje Zijlstra)

VALUE MATRIX MILLING

	SITE	STRUCTURE	SKIN	SPACE PLAN	STUFF	SOCIAL	STORY
AGE							
HISTORICAL	- Start industrial process and connection to other buildings on complex	- Pragmatic spaceplan adjusted to its use - Define streets and squares		- Form follows function - Diversity in space	- Machines from different times - layers		
COMMEMORATIVE							
ARTISTIC		-Flour Tower landmark concrete structure		- Greatness industrial scale - Good preservation			
USE		- Carrying capacity - Good condition		- Determined by machines	- The machines seem to still work when active		
NEWNESS					- Machines in good condition		
CONFLICT				Vertical production vs Horizontal process			
NOSTALGIA							

THEMES

- 🔵 Character
- 🟡 Process
- 🟢 Memory

CHARACTER

The Milling is one of the buildings in the centre of the MMC and before transforming it is neccesary to define its character, the essence of the Milling. What are the characteristic qualities of the building?

Image 44: Colourized Section of the Milling showing its atmosphere (Architectural analysis Middle group p.137)

Historical & Use & Newness - Stuff

- Machines from different times - layers

- Machines in good condition

- The machines seem to still work when active

The Milling has a lot of machinery which is still present and in good condition. These machines do give a lot of character to the spaces and underline the historical use, and industrial atmosphere but are also potentially in conflict with a new function for the building. How to deal with all the stuff? What does removing the machinery mean for the character of the space?

Image 45-46: Machinery inside the Milling (45: Hielkje Zijlstra)

Historical - Structure

- Pragmatic spaceplan adjusted to its use
- Define streets and squares

The Milling building produces flour from wheat and every stage of this process is situated in a different part of the building. These four building parts are clearly visible in the difference in interior, the construction, materials and even in the facade of the Milling. Within the building there are two silo parts: small silos and large silos, in between these silos a part with machinery is present and at the end of the large silos the Flour Tower where the flour is put into bags and stored before transported. The clear difference in building parts per activity is characteristic for the Milling.

Image 47-48-49-50: Small silos - Machinery - Large silos - Flour Tower

Image 51: The facade of the Milling showing the different building parts (Architectural analysis Middle group p.150)

Artistic - Structure

-Flour Tower landmark concrete structure

The artistic values found in the structure and space plan are similar to the ones found for the site. The Flour Tower acts as a landmark for the MMC with its height and distinctive concrete grid structure. It marks the ending of the Milling.

Image 52: The Flour Tower

Artistic - Space plan

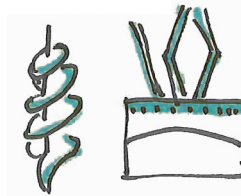- Greatness industrial scale
- Good preservation

Besides the landmark also the large industrial scale is a recurrent value. This industrial scale is not only present in the exterior but also in the interior of the Milling.

Image 53-54: The big industrial scale of the interior and exterior

CHARACTER

MACHINES

FOUR PARTS
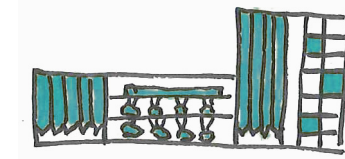
LANDMARK
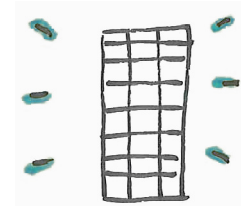
BIG SCALE
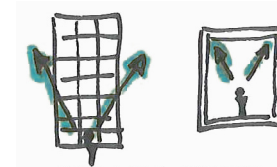
PROCESS
The Milling produced fine flour from wheat. Starting in the small silos where the wheat was stored from there the wheat was washed up to six times. After the washing the actual milling commenced in the large middle part, the more times the wheat was milled the finer the flour. The final product, the flour, was stored in the large silos and from there parts were put in bags in the Flour Tower and went to the Supermarket or to the other buildings to produce bread, cookies or pasta.
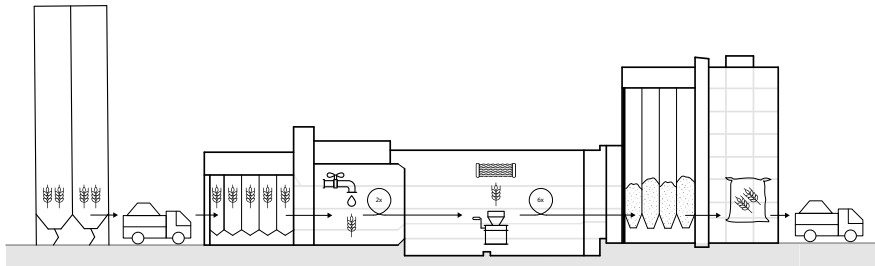

Image 55: The production process of the Milling building

Use - Space plan

- Determined by machines

The machines obviously are a big part of the production process. They determine the layout and spatial experience of the separate spaces. The importance of the machinery is stressed when realising that the spaces are adapted to the space needed for the machinery. New machinery meant new spaces and if needed a new construction.

Image 56-57: Machinery inside the Milling (left: Hielkje Zijlstra)

Conflict - Space plan

Vertical production
vs
Horizontal process

The process of making flour from wheat has several production steps as previously mentioned. These steps are 'storing' 'washing' 'milling' 'storing' and 'packaging' and are all done in their own building part. This production is a vertical production starting from the top floor (by either filling a silo or the first round of milling) to the ground floor. The overall process however is a horizontal movement on the ground levels taking a finished product to the next step. The wheat comes in at one side and the flour leaves the building on the other side.
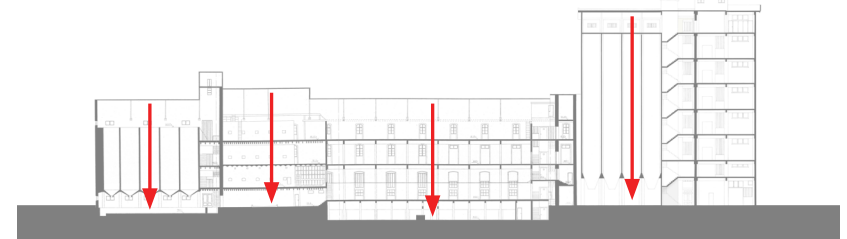

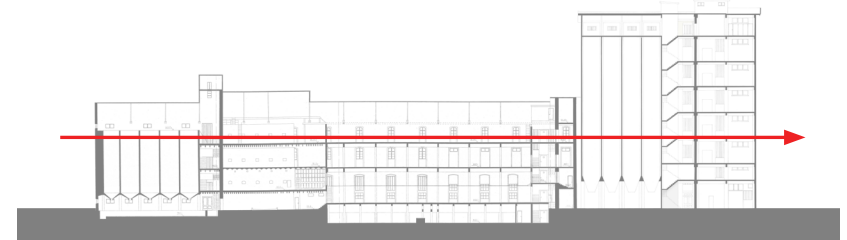Image 58: Section showing the vertical and separate production

Image 59: Section showing the overall vertical process

Historical - Site

The Milling building is not the first building where the wheat gets stored, this is actually done in the large Silo on the complex. But nothing happens to the product before it comes to the Milling. In the Milling the actual production starts with producing flour from wheat. This flour is necessary, the one ingredient binding all the other factories. It is therefor that we can call the Milling the start of the production process.

As mentioned for the site the connections between the buildings are valued. For the Milling this means something extra as well because, looking from a historical perspective, the Milling had more connections not only for products but also bridges between the Milling and Bakery.
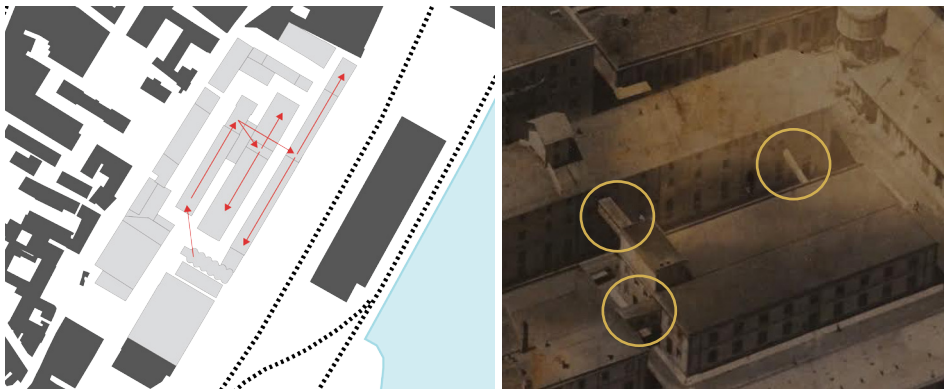

Image 60-61: The production process of the site distributing the flour from the Milling (60, Groupwork Cultural Values p.11). Connections, bridges, between the Milling and the Bakery (61, Jeroen van Lier).

Historical - Space plan

- Form follows function
- Diversity in space

As the main function of the Milling was to produce the amount of flour that was necessary the changes made over time were pure functional and pragmatic. The production was the number one priority and not the building. These changes are still visible in the different layers of construction and machinery over time.
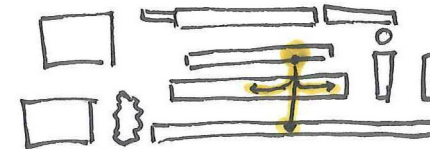
PROCESS

MACHINES
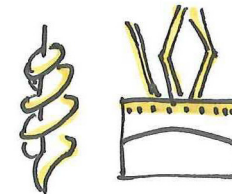
ALL DIFFERENT PARTS
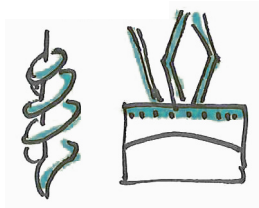WORKING AS ONE
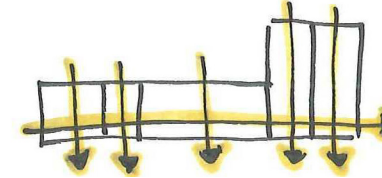
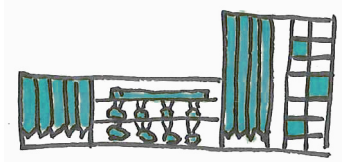START OF PRODUCTION PROCESS

PRODUCTION > BUILDING

CONCLUSIONS MILLING

CHARACTER

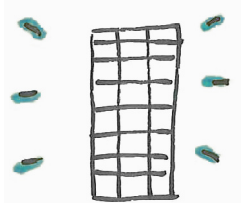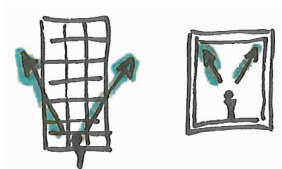### MACHINES

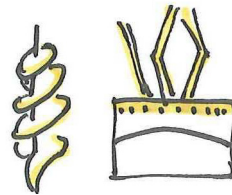### FOUR PARTS
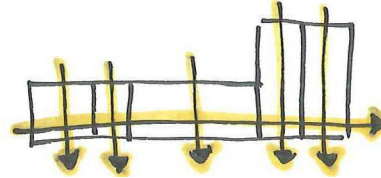
LANDMARK

BIG SCALE
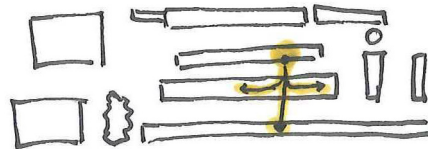
PROCESS

MACHINES

ALL DIFFERENT PARTS WORKING AS ONE

START OF PRODUCTION PROCESS

PRODUCTION > BUILDING

DILEMMAS
The found Cultural values are the essence of that what makes the Milling the Milling, and thus the values we want to take into the future. When transforming a site these values can cause for the so called 'dilemmas' as the values might be contradicting with what is desired for future use. For the MMC there are two dilemmas found:

MACHINES   BIG SCALE
VS   VS
NEW FUNCTION   HUMAN SCALE

The most important dilemma of the Milling is the dilemma of the machinery. This dilemma occurs in most industrial sites as the machinery is what the site was all about. The skin of the building is just protecting the machinery and its production process. But on the other side, the machinery prevents a new function to settle inside the building unless that function is a museum about the machinery like the MAAT museum in Lisbon where a large part of the museum is the permanent exhibition of the machinehall and the former electricity production (https://www.maat.pt/en). But we cannot transform every industrial site into a museum. It is important to look forward to future needs of a place and community as well as what we want to take into the future. So the dilemma between the machinery and the new function is evident. Will we keep (all) the machinery or do we get rid of everything in order to make space for a new function?
The next dilemma we found coincides with the dilemma for the site which is the 'big scale' character as explained on page 21. This big scale is also present in the Milling and thus gives a dilemma of wanting to keep this industrial characteristic and meanwhile wanting to make it suitable for people. Obviously the Milling was build for people to work in the factory but this large scale needs a human factor when transformed to a new function which is not a factory. It is also a potential to use this large scale to design unique spaces with a difference in scale.

So in conclusion we value the character and the process of the Milling building. Noticeable is that the memory value (present in the site analysis) is left out. This because the Milling is in the centre of the MMC and therefor not very visible to the neighbourhood making it not very memorable to its surroundings. And over time the people who worked in the Milling are no longer there, the new generation does not remember the Milling. Overall it can be said that the memory values of the Milling are not present.

To maintain the character of the building the Milling has to:
- Try to incorporate (parts of) the machinery in its new function.
- Keep its distinctive different parts.
- Keep its landmarks of the Flour Tower.
- Maintain its big scale but also introduce a human scale to make it liveable (dilemma).

To maintain the process of the building the Milling has to:
- Try to incorporate the machinery in its new function.
- Function like the old process: vertical process in each building part but together working as one horizontal production on the ground floor.
- Be the starting point of the MMC.
- Be pragmatic in its essence.

Image 62: Old ovens inside the Bakery (Hielkje Zijlstra)

VALUE MATRIX BAKERY

	SITE	STRUCTURE	SKIN	SPACE PLAN	STUFF	SOCIAL	STORY
AGE							
HISTORICAL	- Representative front facade and old ovens space	- Layers construction type		- Form follows function - Diversity in space	- Machines from different times - layers		
COMMEMORATIVE					- Keeping the old ovens		- Tiles tell story of old Bakery
ARTISTIC		- Ornamentation trusses and cast-iron columns	- Front facade Bakery - Chimneys	- Determined by machines	- Old tiles Bakery		
USE		- Determines direction		- Connection between floors for production			
NEWNESS					- Machines in good condition		
CONFLICT		- The exterior "hides" the different layers, where the interior reveals them					
NOSTALGIA							

THEMES

- 🟢 Character
- 🟡 Process
- 🟢 Memory

CHARACTER
The Bakery is one of the buildings in the centre of the MMC and before transforming, it is necessary to define its character, the essence of the Bakery. What are the characteristic qualities of the building?

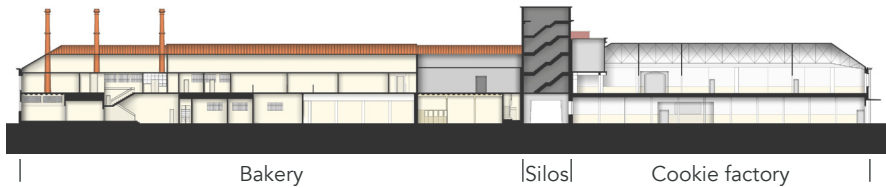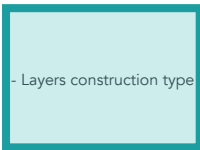|		
	Bakery	|Silos| Cookie factory	

Image 63: Colourized Section of the Bakery (left) and the Cookie factory (right) connected by small silos in the middle, showing its atmosphere. (Architectural analysis Middle group p.138)

Historical - Structure

- Layers construction type

The Bakery used to have a cast iron column construction but in 1955 the middle part of the Bakery changed because of development of the production process (see page 41). The new ovens needed more space and therefore the cast iron columns were replaced by a monolite concrete structure and an extra floor has been added that 'completes' the volume. This newer middle part now holds a different character than the older parts. The middle part has a more industrial feel with everything oversized and a lack of details, a space with one purpose and no distractions: baking bread. Even though it is not the most representative space, the structural change emphasizes this central space as a different space of change and purpose.
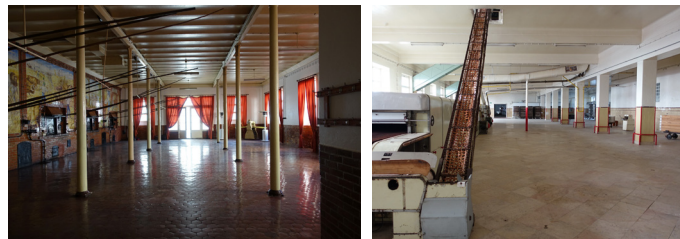

Image 64-65: Space with old cast iron columns (left) and newer space with concrete structure. (Hielkje Zijlstra)

Historical - Site & Stuff - Commemorative & Artistic

- Representative front facade and old ovens space

- Keeping the old ovens

- Old tiles Bakery

Probably most notable of the Bakery are the old ovens. These ovens are situated at the entrance of the Bakery. This space has a representative character with shiny warm redbrown honeycomb tiles, cast iron columns, a vaulted ceiling and most important the old ovens. These ovens have decorative painted tiles depicting the process of making bread. In front of the ovens the old bread paddles hang from the ceiling giving lots of character to the space. Over time new ovens were needed making these old ovens unnesesary. As the site was industrial, all desicions made would probably be pragmatic, why then would they have kept these ovens? A reason could be that they wanted to be able to continue baking while the space for the new ovens was build. Another reason could be that they wanted to keep the old ovens for commemorative reasons. Nowadays they do exactly that: commemorate the bakery and give lots of character to the space. From the outside the Bakery we can see the chimneys of the old ovens enhancing the industrial character of the site.

Image 66-67-68: Old ovens Bakery with storytelling tiles and the chimneys. (Left Hielkje Zijlstra)

Artistic - Structure

- Ornamentation trusses and cast-iron columns
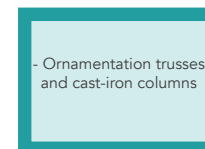
The Bakery is layered in lots of ways but special attention should be given to the structure. First of all we find different columns. There are the cast iron columns which are interupted by concrete columns in the centre space. Then there are three different kind of trusses found within the Bakery. Wooden trusses and two types of steel truss-

es. The differentiation in the structure gives a lot of character to the Bakery as it shows the layers in time as well as being aesthetically pleasing elements.

Image 69 t/m 74: Wooden and steel trusses with different details

Artistic - Space plan

- Greatness industrial scale
- Good preservation

Distinctive for the Bakery are the completely different building parts in the interior which do not show at the exterior. First there is the representative old oven part. Second the large concrete structure centre space and third closing with the more streetstyle industrial space. The difference can be found in the structure, different materialisation (e.g. flooring: redbrown honeycomb tiles, natural stone tiles in diamond pattern, dark bricks in a basket weave pattern) and machinery (old ovens, large new ovens, small movable elements). These different parts each contribute to the diverse character of the Bakery.
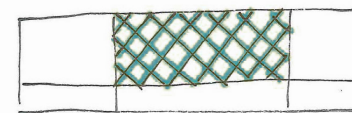

Image 75-76-77: Different building parts shown in structure, materialisation and machinery. (Hielkje Zijlstra)
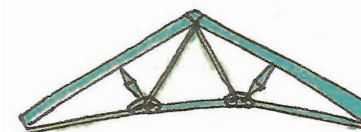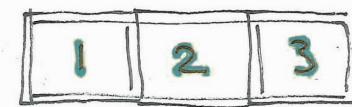
CHARACTER

OLD OVENS & MACHINES
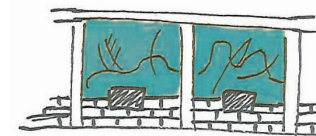
LAYERED STRUCTURE

TRUSSES

BUILDING PARTS

PROCESS

The Bakery produced, no surprise, bread. But besides bread there was also a space for a small coffee factory. In between the Bakery and the cookie factory flour was stored in small silos from there the flour was divided between the two factories. The mixture for the bread was made and the dough rested before going into the oven. From the ovens the bread was stored at the first floor and through slides loaded into trucks to ship the bread for the army.
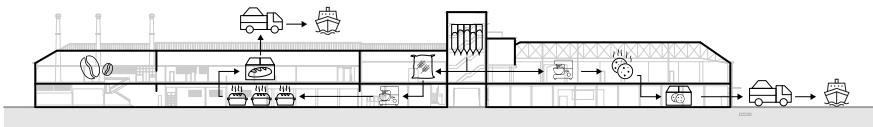

Image 78: The production process of the Bakery

Use - Space plan

- Form follows function
- Diversity in space

- Connection between floors for production

The process of making bread has several production steps which can be shortened as 'storage' 'kneading' 'resting' 'baking' 'packaging'. Each of these steps has its own specified space in the Bakery. This process is visible in the connections between spaces which shows the route of the product.

Image 79-80-81: Product route visible (80-81 Hielkje Zijlstra)

Historical & Newness - Stuff

- Machines from different times - layers

- Machines in good condition

The production is the most important function for the building. For this production machines are necessary. They determine the spaces, how it is used and how it is designed. New machinery means new spaces and if needed a new construction. Within the Bakery we can find machinery from different times like the old ovens and the newer more industrial ovens (automatically transports the bread) which all seem to be in good condition. There is also a difference in fixed and movable machinery or objects used for the baking process. Nowadays a part of the machinery has been removed.

Image 82 t/m 85: Different machinery in the Bakery (85 - Hielkje Zijlstra)

Image 86-87: Ovens in use vs. now (86 - Docomomo International photo archive MMC, 87 - Hielkje Zijlstra)

Use - Structure & Artistic - Space plan

The Bakery has a clear linear direction which is determined by its structure and its machinery. From the entrance there is a straight line through the entire building guiding through its spaces.

- Determined by machines

- Determines direction

MEMORY

Even though there is the difficulty to have a memory value with a building that is not even visible from the street memory value can be found within the Bakery.

Commemorative - Story

- Tiles tell story of old Bakery

The Bakery has a unique space that tells the story of the Bakery and it's former glory. The entrance space with the old ovens is decorated with tiles that shows the history and the purpose of the building. Even when the people working there are gone, new visitors will also know about the building when entering this space.
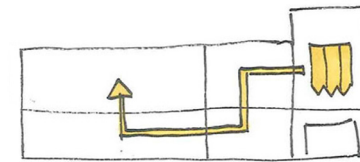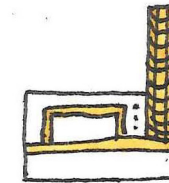
MEMORY

STORYTELLING TILES
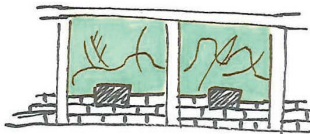
PROCESS

PRODUCT ROUTE
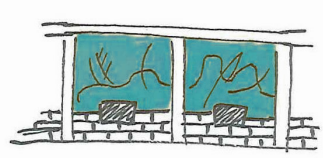

MACHINES
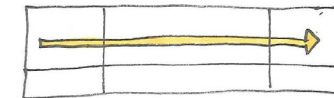
LINEAR DIRECTION

CONCLUSIONS BAKERY

CHARACTER

OLD OVENS & MACHINES

LAYERED STRUCTURE
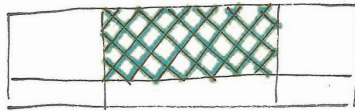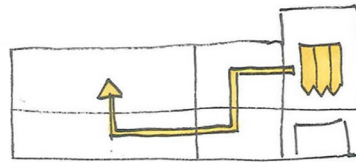

TRUSSES
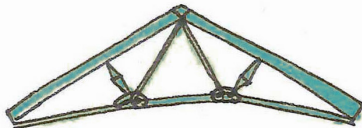
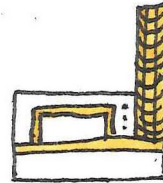### BUILDING PARTS

PROCESS
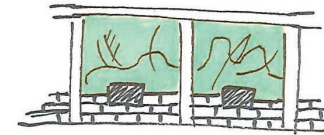
PRODUCT ROUTE

MACHINES

LINEAR DIRECTION

MEMORY

STORYTELLING TILES

DILEMMAS
The found Cultural values are the essence of that what makes the Bakery the Bakery, and thus the values we want to take into the future. When transforming a site these values can cause for the so called 'dilemmas' as the values might be contradicting with what is desired for future use. For the MMC there are two dilemmas found:

MACHINES   BIG SCALE
VS   VS
NEW FUNCTION   HUMAN SCALE

As for the Milling, the most important dilemma of the Bakery is the dilemma of the machinery (see Milling conclusion). It is important to look forward to future needs of a place and community as well as what we want to take into the future. So the dilemma between the machinery and the new function is evident. Will we keep (all) the machinery or do we get rid of everything in order to make space for a new function?
Within the Bakery, the machinery is already partly removed and the movable objects are now on display within the Bakery or in the MMC museum in the old convent. Some of the machinery are decorative, like the old ovens, but the huge newer ovens are mostly blocking the light from the street. We could say that there is a hierarchy in importance for the machinery that have to stay to maintain the character of the Bakery.
The dilemma of the big vs human scale is not found within the Bakery as it has a much more human scale. The dimensions of the Bakery are not extreme, this is also shown with the scale of the machinery as people were needed to operate them.

So in conclusion we value the character, the process and the memory of the Bakery. Even though the Bakery is not visible from the street, the representative facade and old ovens with the storytelling tiles, have a memory value for the building.

To maintain the character of the building the Bakery has to:
- Try to incorporate (parts of) the machinery in its new function.
- Keep the (layering in the different) construction types.
- Keep as many of the artistic structural elements of the building.
- Keep its distinctive different parts.

To maintain the process of the building the Bakery has to:
- Try to incorporate the machinery in its new function.
- Function like the old process: follow the production line.
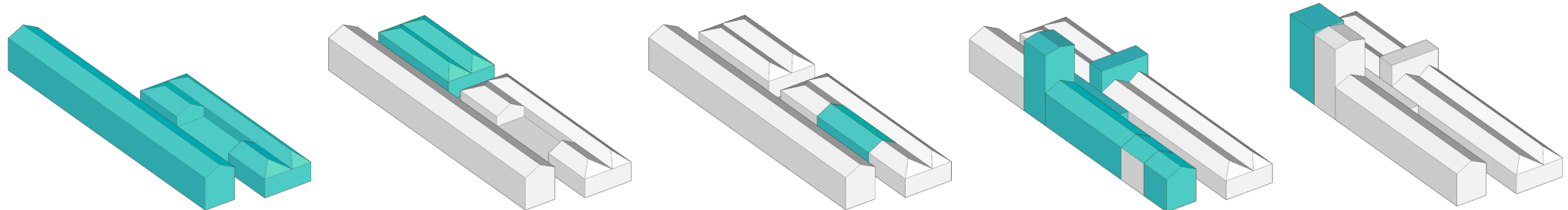- Have a clear linear direction in its space plan.

To maintain the memory of the Bakery the site has to:
- Keep the old ovens and the decorative tiles in its setting of the space now.

Image 88: Aerial view 1934 (Jeroen van Lier)

DEVELOPMENT MILLING & THE BAKERY

| 1898-1910 | 1920-1930 | 1955 | 1970s | 1980s |

(Image 89: Based on Architectural analysis Middle group p. 126)

DEVELOPMENT MILLING & BAKERY
A brief overview of the development of the Milling and Bakery. For more information see the Architectural and Technical analysis of the Middle group.

1722 - Origin of the Military Service.

1862 - Experiment to manufacture and supply bread to the army. A Military Bakery is created on a site now known as Rocah do Conde de Obidos named ''Padaria Militar''.

1896 - Ministerio da Guerra takes possession of the current site. Name changes from 'Padaria Militar' to 'Manutençao Militar'.

1898-1910 - Construction of several factories, including the Milling and the Bakery.

1920-1930 The Cookie factory has been added to the ensemble.

1955 - Part of the Bakery has been changed because of development of the production process. Therefore the cast iron columns have been replaced by a monolite concrete structure and also a floor has been added that 'completes' the volume.

1961-1974 - During the Ultramar War, Manutençao Militar is very active in the provision of food for the troops. In this period the MMC reached its maximum level of production: silos were built and the production process was modernized, especially in the mill building. The new machines asked for a specific concrete structure, for that reason most of the original floors were removed.

1970s - Almost the complete roof of the original Milling has been replaced. This is the consequence of internal changes,

1975 - Independence of the former colonies: MMC had to reduce the production.

1980s - The Flour Tower has been added to the ensemble. In 2011 the complex officially closed most of the factories, of which the bakery was the last.

CHRONOLOGICAL EVOLUTION MAP

MILLING
With the 'traffic light' system of Suzanne Fischer a chronological evolution map of the Milling is made. Noticably are the changes made on the interior structure leaving the original walls intact. The later additions which replaced part of the older structure are build in the same grid (width).

LEGEND

- 1898 - 1910
- 1898 - 1910 (in view)
- 1970s
- 1970s (in view)
- 1980s
- 1980s (in view)

Image 90: Chronological evolution map Milling (Technical Analysis Middle group p.121)

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BAKERY

With the 'traffic light' system of Suzanne Fischer a chronological evolution map of the Bakery is made. Noticably are the changes made on the interior structure leaving the original walls intact. The later addition of the small silos in between the bread factory and the cookie factory made for a faster production and better connection between the two buildings.

LEGEND

● 1898 - 1935
● 1898 - 1935 (in view)
● 1955
● 1955 (in view)
● 1970s
● 1970s (in view)
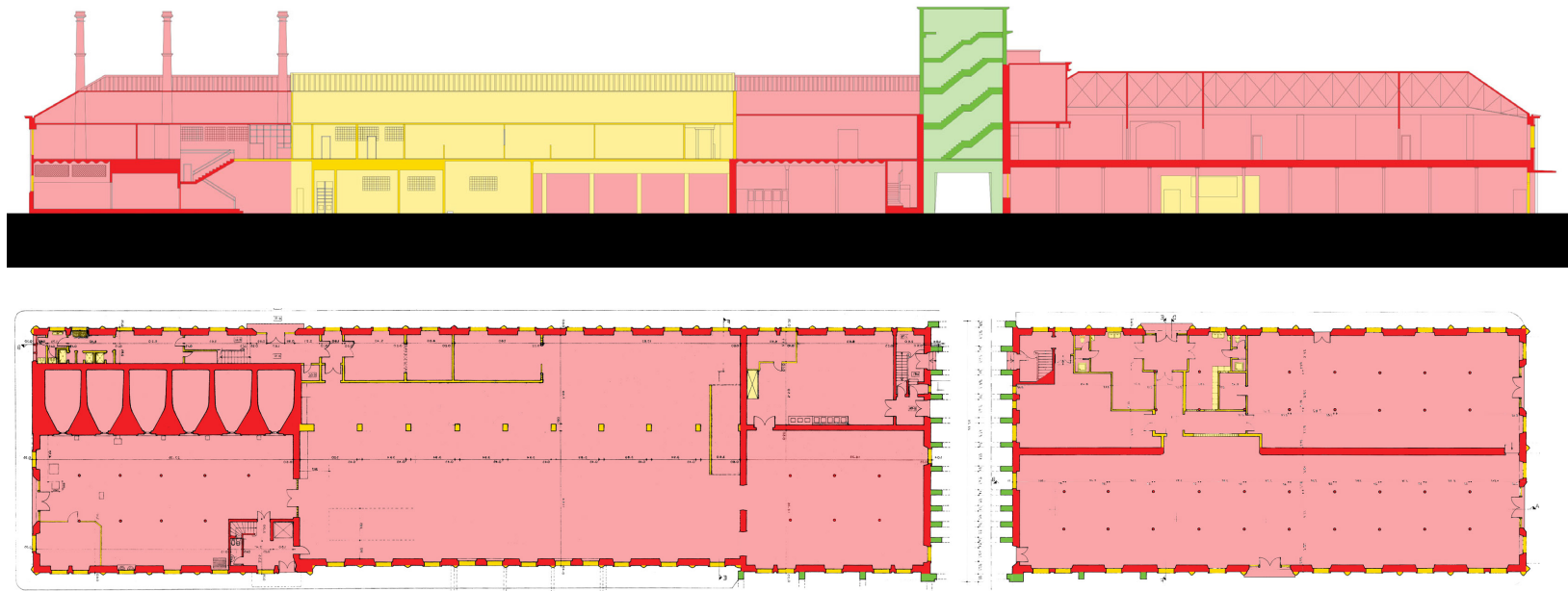
Image 91: Chronological evolution map Bakery (Technical Analysis Middle group p.120)

Image 92: Aerial view Manutencao Militar Complex (Google, 2016)

1a.
1.
15a-d.
2.
1b.
3.
4.
Rua do Grilo
Manutenção Militar
14.
18.
15.
16.
13a.
16b.
19.
Av. Infante Dom Henrique
20.
Rua do Grilo
13.
16a.
5.
17.
7.
12a.
6.
8.
12.
9.
10.
11a.
11.
Google

FISCHER MAP SITE

SUZANNE FISCHER

On page 9 the method of the value map of Suzanne Fischer was explained resulting in a chronological evolution map shown on page 32. Only age does not directly means that something is valuable. For the MMC this 'traffic light' method is used to show the personal values assessment for the buildings on the site (see image 67). A description of all the buildings and what is important about that building is briefly explained to support the personal values assesment. This is however a personal and individual interpretation of the site and its buildings.

As described in this cultural values assessment the theme of 'character' is hard to define but important to maintain when transforming heritage. The character is defined by the parts/things and stories that make the MMC the MMC. The building (parts) which are the most important of keeping that essence or character are therefor marked with a high value:
1. Supermarket - The base of the supermarket is one of the oldest structures and the Supermarket had an important social role to its neighbourhood.
4. Convent - The Convent reminds of the religious and former wealthy Beato and dates from 1665.
5. Powerplant - The esthetical qualities of the Powerplant with its arched windows and high ceiling and roof structure are of high value for the site.
7. Watertower - The watertower is a structure that underlines the industrial character of the MMC.
11-13. Pasta factory - The Pasta factory with a length of 200m and rigid concrete structure acts as a boundary between the MMC and the road.
14. Silo - The Silo acts as a landmark and underlines the industrial character of the MMC.
16. Bakery - The old part of the Bakery gets a high value as described in the previous chapters.
17. Cookie factory - The Cookie factory is one of the oldest structures.
18. Milling - The Milling gets a high value as described in the previous chapters.
20. Flour Tower - The Flour Tower acts as a landmark or placemaker for the MMC and gives character to the place with its rigid concrete structure.

Besides the high value there are also some average value structures as they do have some essential qualities but mostly as part of something else and not on its own.
1b. Supermarket bakery - Later addition with no clear own identity.
2. Small convent structure - Smaller version of the Convent.
8 and 9. Repairs and administration - Lesser version of the powerplant.
10. Small warehouses - The small warehouses are cut off from the site by 8. and 9. but do mark the entrance to the MMC

15a-d. Warehouses - With triangular shaped buttresses.
16b. Bakey - The structure is replaced by a concrete structure.
19. Silos - Not as valuable as the 14. Silo but part of the Milling.

The buildings or structures appointed with a low value are mostly added, shed like structures which undermine the underlying qualities of the buildings surrounding them.
1a. Hall - Additional small hall-type with concrete structure
3. Garage - Additional garage like structure shielding parts of the old convent.
6. Shed - Shielding the watertower and aesthetical building 5. and 8.
13a. Pasta factory - later addition attached to 14. Silo undermining its strong stand alone character.
15. Shed - later addition of concrete blocks
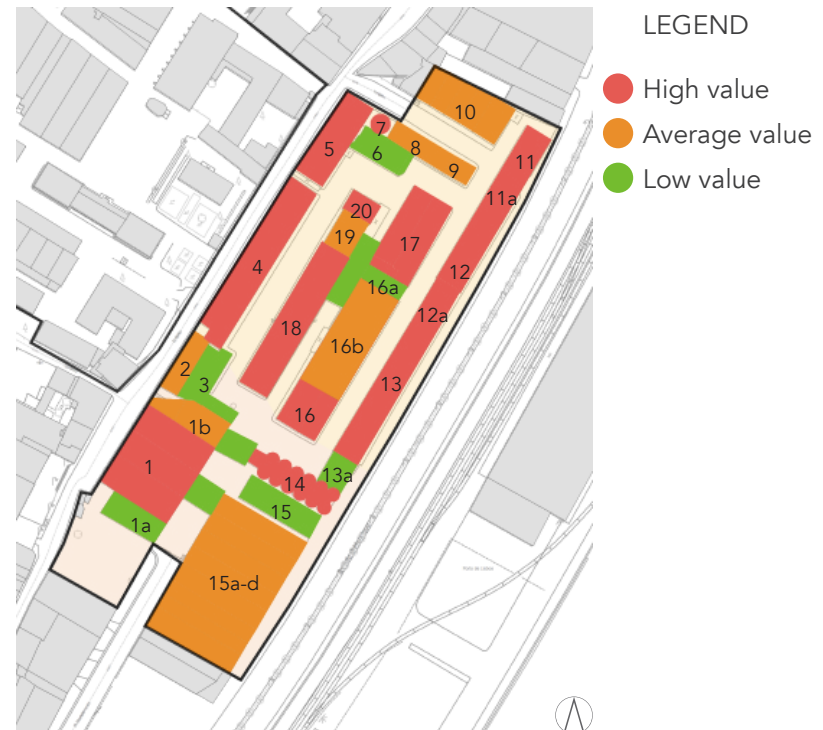16a. Small Silo and storage - very badly constructed and thus damaging the Bakery and Cookie factory.

LEGEND

🔴 High value

🟠 Average value

🟢 Low value

Image 93: Personal value assessment site 1:4000

REFLECTION

We got to work with a new method, the value matrix, and I found this a great tool to analyse with but it can be a bit confusing on what is meant with which value. Therefor when using this tool a knowledge about the theories of Riegl and Brand is necessary. As there are so many boxes to fill in you tend to try to think of more values and describe aspects of the site or building which actually are no values but just something that is there. Another thing I found usefull was filling the boxes with more people to get a discussion about the different values. Later, when looking back more critically, the real values could be filtered out of the matrix. I think it is very important to remember that the matrix is a tool and not an end product. I would also recommend anyone working with the tool to look for certain themes as they show the categories in which to find the essential values of a site or building. Defining a value can be quite challanging as it is difficult to pinpoint what it is that is valuable especially when it concerns intangible stories.

Looking back at my design and how I used the defined cultural values in my graduation project I found that whenever I was stuck in the design I had to go back to the cultural values to refreh and reshape what I value and why. This helped to make design decisions starting from the existing. The heritage actually provides all the tools to design, but you really have to delve into it first and get to know the buildings.

CONCLUSION

The Manutencao Militar Complex has many cultural values which can be discovered using the Value Matrix. The values found can be grouped in the themes of Character, Process and Memory. While transforming a site it is important to try to maintain these values in order to keep the essence of the MMC.
The cultural values are important for the transformation framework as they provide starting points for the overall design and should be viewed as opportunities on which to build a design.

Image 94: Panoramic view of the Milling

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