

A LUZ NA CASA

Graduation Book | Studio Revitalizing Heritage

by Emişgül Esra Şahin

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Preface

The book is a documentation of research and design of my graduation studio. My personal interest were always towards heritage and history. The booklet will start with the first chapter on the research about values of locals and tourist on Faro's heritage. This research took place during the first semester in Portugal, Faro. The second chapter is about the design based on the values, researched in chapter 01. The last chapter will assess the impact of this redesign.

I learned a lot, I worked a lot but also did enjoy this graduation studio a lot. I hope you will enjoy reading this as much a I did. It was a real dream to work on this project,
a graduation like no other..

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Group work by Krist van Herck, Emişgül Esra Şahin & Roy Swinkels

Chapter 01

REVEALING BUILT HERITAGE THROUGH SOCIAL MEDIA

Researching the values of Faro's heritage

ABSTRACT

Society conveys values to cities and their buildings, the key to sustainability, only in part recognized as heritage values, when protected by urban and/or heritage planning. There is a growing recognition of the importance of acknowledging the values conveyed by locals and tourists in heritage management and urban planning. However, the knowledge and tools available today remain predominantly expert-based. Their contribution to heritage listings and conservation plans is therefore limited. Moreover, some cities tend to unbalance locals and tourists' needs, leading to overly touristic areas, gentrification and communities' exodus. Although research on the values conveyed to cities and buildings is growing, there is seldom research comparing them. Hence, how do the attributes and values of Faro's heritage conveyed by locals and tourists set the frame for transformation? This research aims to reveal the cultural significance (values and attributes) conveyed by locals and tourists, taking the neighborhood São Francisco (included in an Urban Rehabilitation Area) in Faro, Portugal, as case study. And will provide a masterplan as a visualisation of the results gathered by this research. The guidelines provided by the masterplan address the current challenges of the neighbourhood further than the actual policies in place. By using multiple methods to perform spatial analysis, which includes (1) photographing, mapping and categorization of the facades and their attributes in São Francisco, and, (2) social media analysis, where hundred Instagram posts were manually collected following strict guidelines, heritage attributes could be identified. (3) Public engagement was used in the site survey game in which pictures of the attributes would be shown to locals and tourists who would connect predefined words to them in order to collect the heritage values. By following these methods, this research aims at revealing patterns and relations between: a) attributes, in particular, buildings' facades and their characteristics and b) values (distinguishing local and tourists). After the fieldwork, results showed clear concurrences and contradictions between both communities. **Results revealed low values for contemporary apartment complexes and higher values for pre-existing typologies in both groups.** Furthermore, attributes such as the street art, the materialisation of facades, and the authenticity of attributes developed into design guidelines for a masterplan in which these relations are portrayed. By understanding these relations, the Municipality of Faro can improve their awareness of who values what, and why, in order to support their strategies about how to accommodate new functions in historic buildings while respecting the limits of acceptable change of built heritage according to these stakeholders. Hence, the expected impact is to raise awareness about the cultural significance of both societal groups in order to better inform heritage management and urban sustainable planning.

Keywords | *cultural significance, urban rehabilitation, building characteristics, tourism, São Francisco - Faro*

Masterplan
The results of the research concluded in a masterplan which can be found on page 36

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Cultural Significance Survey Paper

1.1 INTRODUCTION

[1] **Globalizing**
to (make a company or system) spread or operate internationally

Our world has been globalizing[1] at an accelerated pace in recent decades. **Due to this phenomenon, local attributes are fading away and being replaced by more and more generic features,** which can be found almost everywhere on the globe. As a result, cities are becoming more difficult to distinguish, geographically or culturally (Pacescu and Thiery, 2015). Urbanization is a phenomenon that has occurred more and more over the last centuries. The United Nations has predicted that 86% of the developed world will be urbanized by 2050 (Merry, 2017).

European Environment Agency (2006) concluded that, from the 17 European countries included in their research, Portugal had the largest increase of artificial surfaces within the 10-km coastal zone between 1990 and 2000. This is the zone where most urban areas of Portugal are located. This increase of artificial surface was the greatest in the Algarve region in the south of Portugal (Freire, 2009).

Part of this urbanization can be explained by the increase of tourism in the Algarve region. This has become an industry on its own in the past decades and asks for more facilities which need to be built, hence, the further increase of artificial surfaces (De Jesus, 2012). This brings added pressure on the housing market in Faro to a level where housing is becoming unaffordable for the local community as owners try to monetise their property as much as possible (Alves, 2019)

Also, this new floating population also brings new sets of values to the area. Where in the past the values of the locals were most important, now the values of the tourists are becoming part of the question. Faro is in the touristic crossroads that many touristic cities face at some point: lacking a response for conveying what is valued both by locals and tourists. These values are often not the same. Therefore, the importance of finding a model which can provide a more democratic understanding of issues and opportunities that the industry brings to a city such as Faro.

In 2005 Faro hosted what is now called the Faro Convention (Council of Europe, 2005). A Council of Europe convention that emphasizes the importance of heritage in relation to human rights and democracy. It encourages people to recognize that buildings listed as cultural heritage are important for varied reasons, including the meaning that people attach to them and the values that they represent that make them important (Tarrafa, Pereira Roders, 2012; Fairclough et al., 2015).

The municipality of Faro has the goal of making the city a destination that focuses on cultural, gastronomical and heritage related tourism. This can serve as a case study for other Mediterranean cities in a similar situation (De Jesus, 2012).
A building facade is assumed to portray the city's image. Facades are essential in historical cities because they represent a country in tourism, through brochures, social media, and postcards, illustrating different city districts (Askaria, Dolaa & Soltanib, 2014).

Even if research has been developing in the field of cultural significance, seldom are the theoretical frameworks that include attributes and values, as well as, their definitions. This research applies the theoretical framework by Tarrafa Silva and Pereira Roders (2012) and Veldpaus (2015) to further identify and determine the values (why is it important) people connect to attributes (what is important).

Colomer (2021) reflects on the gap between research and practice. Accordingly, 'What is needed are new ways of entering into dialogue on the basis of the wishes and inspirations of the public regarding what they value most strongly and consider as their heritage and regarding their deepest understanding of what the human experience should involve.' As such, rather than developing new methods that can be used for research, actual participation is needed in order to develop a more democratic way of dealing with heritage. Social media as a cultural expression contains information that previously was not available and now sheds a whole new light on the opinions regarding heritage. Giaccardi (2012) describes participatory culture nowadays and takes social media as a framework on how heritage is experienced. The methods for revealing the cultural significance of urban heritage through the social media analysis applied in this research developed from research by Ginzarly, Pereira Roders and Teller, 2021, Foroughi et al, 2022 and Bai et al, date. This phenomenon is taken into account as part of a cultural expression showing what is most valued by the amount of interactions it gets. The amount of data produced every day can be testimony of values.



Figure 1. Historical zone with São Francisco,
retrieved from https://www.cm-faro.pt/pt/Default.aspx

By revealing the cultural significance and how they differ in attributes and values, between locals and tourists, the results can then be compared to set the frame for future transformation by answering what is valued, how it is valued and what to redesign. By understanding these relations, the Municipality of Faro can be aware of who values what, and why, in order to support their strategy in how to accommodate new functions in historic buildings while respecting the limits of acceptable change of these stakeholders. The expected impact is to raise awareness about the cultural significance in order to better inform heritage management and urban planning for greater sustainability.

São Francisco was chosen because this neighbourhood is facing patterns of fast urbanization, is close to the city center and is also included in an urban rehabilitation area proposed by the municipality of Faro (figure 1). This neighborhood contains a number of buildings with historic value of which some are vacant and is therefore the perfect area to conduct this research and serve as an example.

In this given context a question arises:

How do the attributes and values of Faro's heritage in São Fransisco, Faro, conveyed by locals and tourists, set the frame for a new masterplan?

This paper reveals the cultural significance (values and attributes) of Faro's buildings, conveyed by both locals and tourists, to better set the frame for transformation in São Francisco, further detailed in a masterplan. In particular, a survey was conducted to reveal the values of different attributes, within the building facade (attributes) of the buildings in this neighbourhoods.

1. What are the attributes and values conveyed by locals and tourists through social media?
2. How are the attributes of the façades valued by the locals and tourists?
3. How do the values on these attributes root the redesign guidelines?

1.2 METHODOLOGY

This research applied three methods, integrating social media analysis, fieldwork in the neighborhood of São Francisco and a site survey game. The first set of data was collected through the manual analysis of social media posts on instagram regarding the city of Faro in which the occurrence of attributes being posted were counted. The second set of data was collected through the analysis of pictures taken of specific attributes from the facades in the São Francisco neighborhood. The result of the analysis from social media along with the collection of attribute information in the area gave place to the game O jogo de palavras (The word game) which was part of the methodology used to analyze value among locals and tourists. In this game locals and tourists would value specific attributes through the selection of predefined words which show their personal opinions connected to values[2].

For this research firstly, hundred social media posts were found on instagram using the most popular hashtags: #tourismodefaro #faroalgarve #faroportugal, and following up with other hashtags such as #visitfaro #farocity #farooldtown #faroportugalpt #farotourism, found used in the first posts. Second, the posts were manually structured and classified by role (locals and tourists), location, caption, hashtags and season. The amount of posts to analyze (hundred) was defined to enable in-depth analysis.

The inclusion/exclusion criteria were the following:

- reference to the built environment, excluding posts on e.g. beach, food or advertisements for local companies.
- dated between January 2021 and April 2022.
- equal number from each season (spring, autumn, winter, summer) to diversify the range of tourists.

The research team is aware that results might be affected by its context, considering the Covid-19 pandemic in 2021, and slow recovery of the tourism industry in 2022.

Secondly, the architectural attributes of the building façades are being analyzed and mapped through field research. By knowing the typologies and categorizing the pictures taken in the fieldwork, the following step was using these categories combined with the social media analysis to obtain the base for “O jogo the palavras”. The pictures used for the game are also fed into the attribute-value matrix.

The third part was the O jogo de palavras. By asking the two different target groups: locals and tourists, it is possible to investigate if there is a difference between people that are in the city for a short period and people who live in the city.

The size of the sample was determined by the time frame from the fieldwork. This time frame consisted of the participation days that enabled us to have a sample of 45 tourists and 45 locals. The amount of time spent in each game took approximately 10 minutes and some exceptional cases a bit longer.

The steps for the game, once the subject is accepted to participate, were divided in 3: Introduction to the game, explanation of the game mechanic and playing time consisting of showing the ten pictures one by one and letting the questionnee connect at least two of the hashtags to the picture.

In the serious game, the locals and tourists would combine the hashtags with facade attributes found in the facade analysis from the fieldwork and the manual social media analysis. Each hashtag is linked with one or multiple values, after the game each survey was analyzed and translated into values based on Tarrafa’s and Pereira Roders’ research (2012).

By looking for differences, things that both groups have in common or stand out, these results will then be translated into text using the dictionary definitions of the hashtags which can be found in (Appendix 1). As a result, the game-result graphs and attribute-value matrix were filled with opinions and values from both groups. From this, conclusions surrounding attributes and values from São Francisco were made. By connecting these attributes to each facade in the neighborhood, organizing them into categories and color coding them accordingly to illustrate the value score that each plot acquired after the analysis, a masterplan has been set up. These scores will turn into the design guidelines for the masterplan of São Francisco. The masterplan will take into account the results from fieldwork in order to have a set of guidelines regarding; building heights, facade conservation, street art and opportunities for further development in the neighborhood.

[2] **Values** derived from the theoretical framework by Tarrafa Silva and Pereira Roders (2012)

1.3 RESULT

1.3.1 Social Media

The cultural significance, conveyed to Faro, through social media is broader than the architectural attributes on building facades. When focusing on these attributes, the posts could be organised into a table where all the social media posts were analysed and displayed, which can be seen in **appendix 2.** This table categorises the posts according to the following criteria: origin (local or tourist), hashtag of origin, posted picture, location, nationality of origin, caption, translated caption, source language of the caption, hashtags used, attribute, post date, post season and link to the post.

Categories
Criteria for the social media analysis

From all posts selected the attributes were extracted from the posted picture itself, the caption and the hashtags. By counting all the attributes extracted, i.e. doors, the percentages that fed into the game were based on facts (table 2).

1.3.2 O Jogo de Palavras

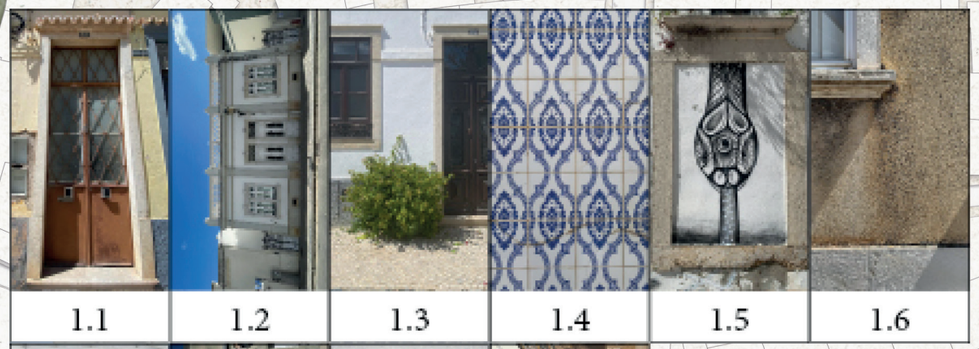
To gather the information linking attributes and values, a card game was implemented departing from the manual analysis of social media. Pictures from the fieldwork analysis were used in this game following the percentages of the occurrence of certain attributes in the social media analysis. The pictures and their location in the São Francisco neighbourhood can be seen in figure 2, on the next page.

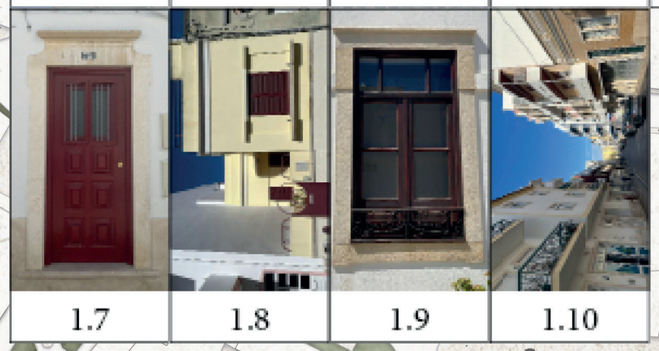
The words, sometimes referred to as hashtags, used in the game, are based on the value chart made in the research of Tarrafa and Pereira Roders (2012). Per value two, sometimes three, hashtags were defined which were not descriptive but showed the opinions or ideas about the attributes. These hashtags are: pride, memories, expensive, cheap, affordable, legal, illegal, typical, authentic, beautiful, ugly, classic, innovative, aged, modern, sustainable and healthy. In appendix 1 the definitions of the hashtags show why and how they are connected to these values.

In total there were three sets which include the seventeen predefined words and some blank cards to offer the possibility for the questionee to write their own hashtags. Also, each set contained a different set of pictures. The idea behind the game was to make it as simple and engaging as possible but short in terms of time for it to be practical in the sense that the shorter it was, the broader the sample could be.

Attribute	Count	Percentage	Percentage into Game
building detail	14	13,21%	10%
building	28	26,42%	20%
street	15	14,15%	10%
streetart	4	3,77%	10%
street accessoire	3	2,83%	10%
city view	5	4,72%	combined with street view
tiles	10	9,43%	10%
door	15	14,15%	20%
greenery	8	7,55%	10%
windows	4	3,77%	10%

Table 2: Social media analysis attribute count



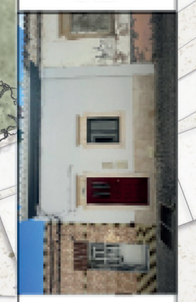


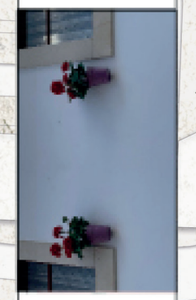


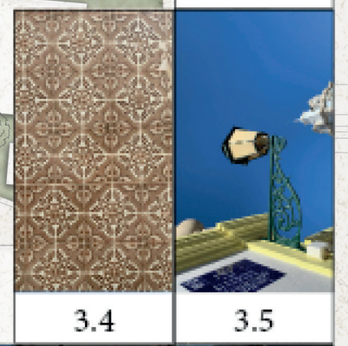












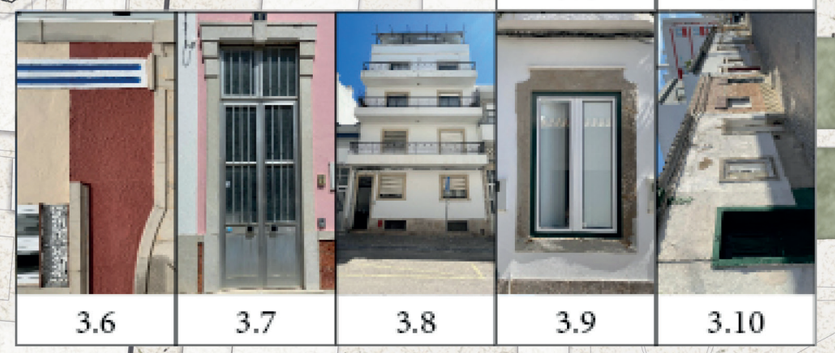


Figure 2. Picture location map

1.3 RESULT

As the words that questionee's connected to the attributes showed opinions, the results of this game underline certain preferences when it comes to architectural attributes. Results were gathered in two formats. The **attribute value matrix** (figure 3) and the game-result graphs (figure 4) which are based on the data in the game-result table (appendix 3). The dictionary definitions of each one of the hashtags used in the analysis (**appendix 1**) provide a clearer understanding of the opinion of both tourists and locals. All results will be discussed in the rest of this chapter

Matrix
Attribute value matrix shows the values of the site survey

1.3.2.1 Attribute-value matrix

The matrix (figure 3) shows some relevant agreements and discrepancies. Shown in the lighter color is the way locals value and in dark the tourist. The agreements and disagreements show a different perspective on how heritage is valued and perceived from two very different points of view. Per value the information was extracted from the matrix and table which will be discussed in the following paragraphs.

Figure 3 shows that social values are seldom conveyed to the selected attributes by both locals and tourists. Figure 4 shows more or less the same amount of pride and memories was conveyed to the attributes by both locals and tourists.

In figure 3 there can be seen that the tourist group focused more on the economical values of the attributes than locals did. Also figure 4 shows that mainly the hashtags 'cheap' and 'affordable' have been chosen by locals and tourists showing the groups interest.

According to figure 3 there is a very low valuation on legality/illegality of the attributes for tourists and locals. The political values only appear in the attribute graffiti.

The historic value is one of the two most conveyed values in this area as seen in Figure 3. Tourists focused on it slightly more than the locals. Building detail attributes are the exception to this, locals focused more on the historic value of these attributes than the tourists did, shown in figure 4

As shown in figure 3 the aesthetic value is the other one of the two most perceived values in São Francisco by both locals and tourists. Figure 4 shows that again building detail attributes are the exception to this, locals focused more on the historic value of these attributes than the tourists did.

A low valuation on the scientific values can be found for both target groups, as seen in figure 3

Figure 3 shows that both groups agree that low maintained attributes are generally conveyed as aged. Figure 4 exhibits that the older typology facades are conveyed as more aged by both groups than the newer typology facades.

There is a very low valuation on the ecology of the attributes for tourists and locals as seen in figure 3. This value only appears in the attributes including facade greenery.

The low evaluation on values does not imply lack of a value on attributes, another explanation could be that the focus of the questionnee or the research was not on them.



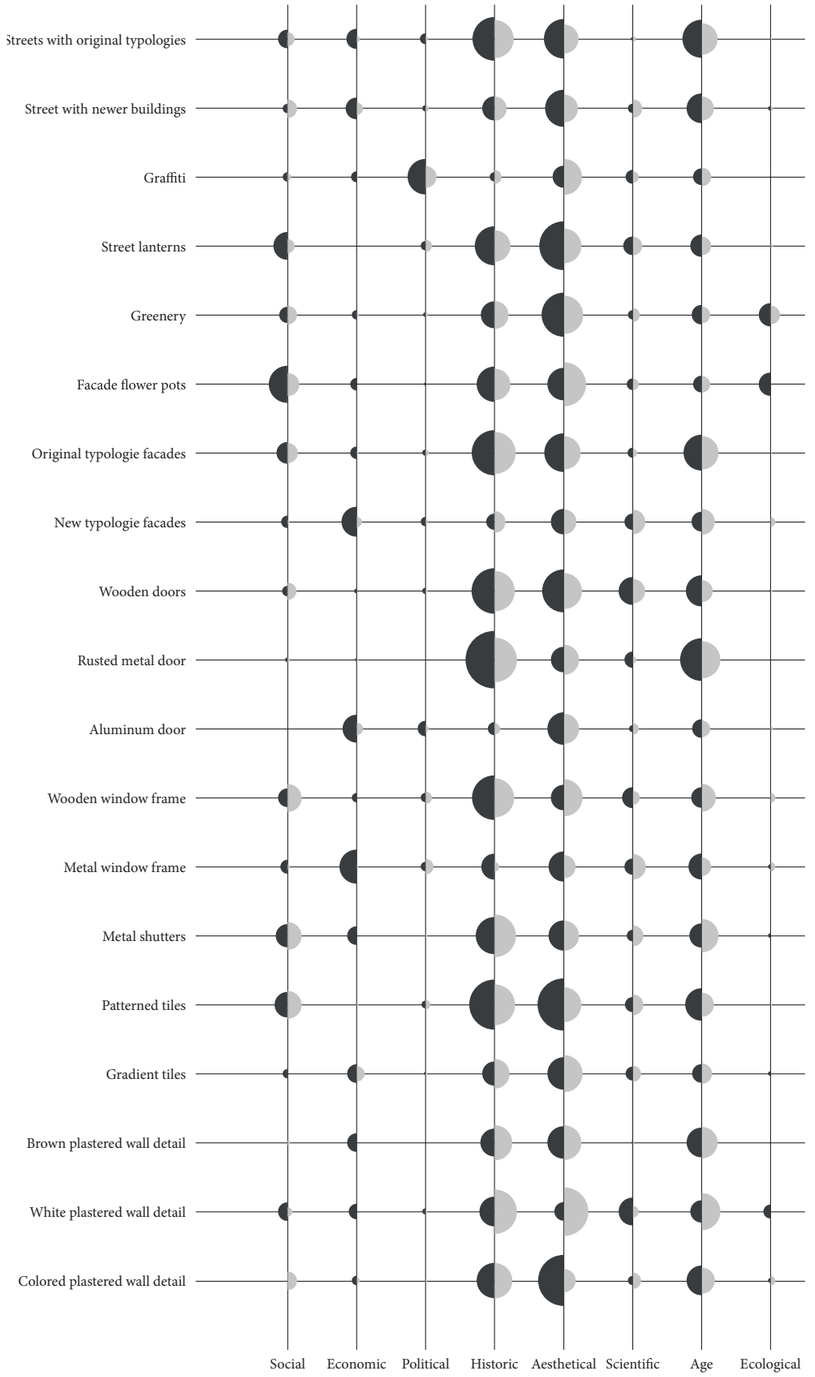
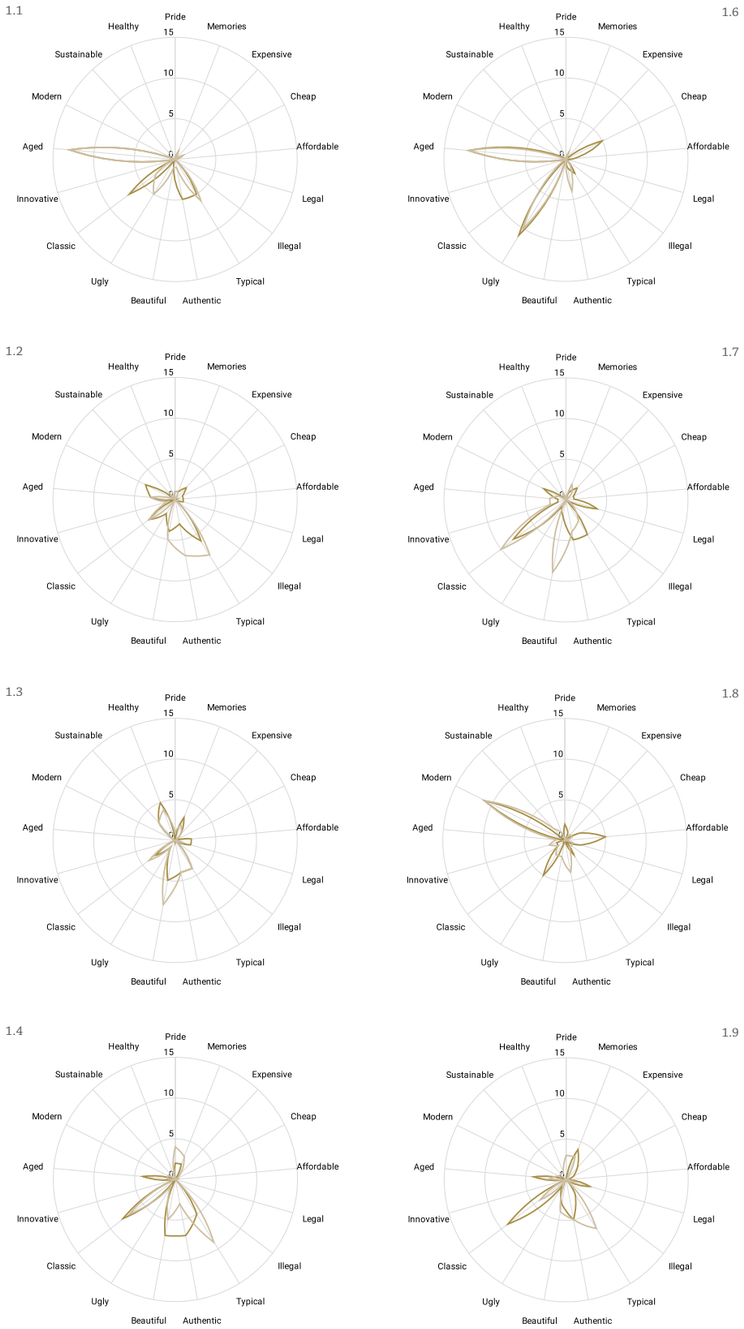
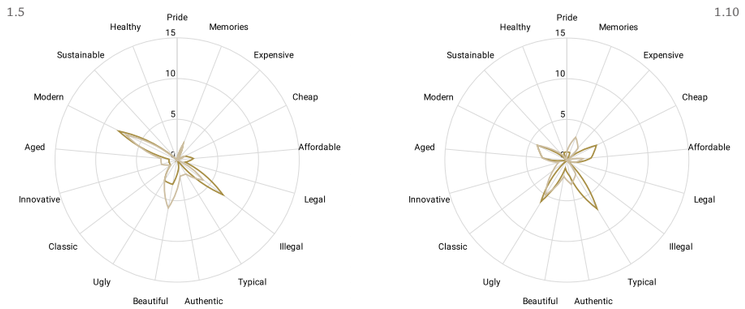


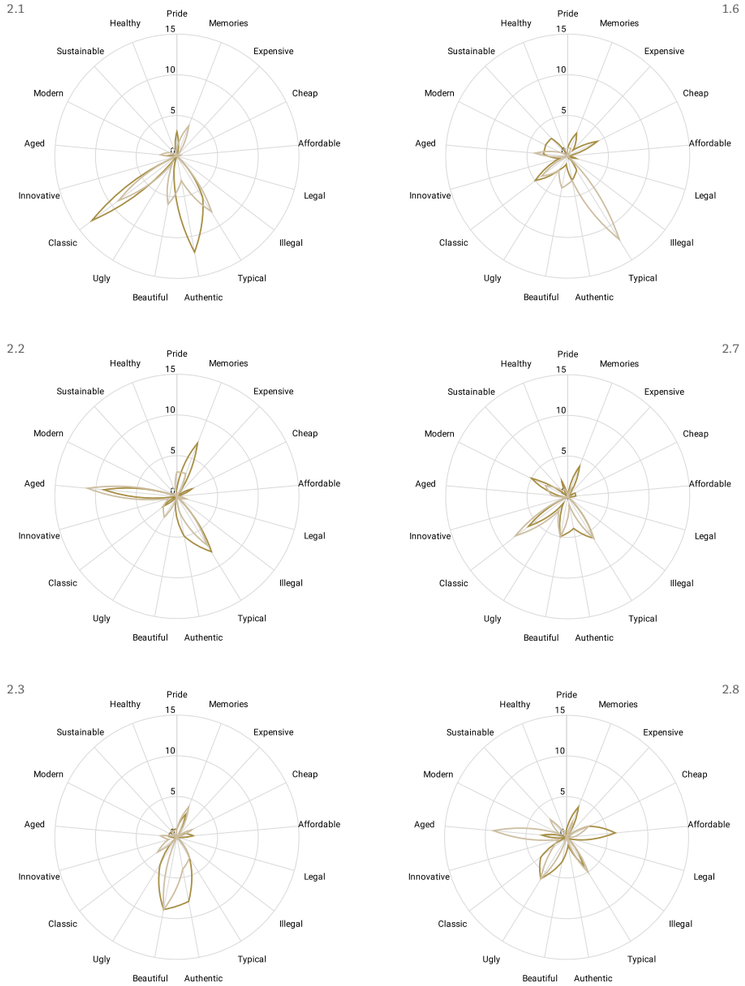
Figure 3. Attribute value matrix

1.3 RESULT

Figure 4. Game-result graphs





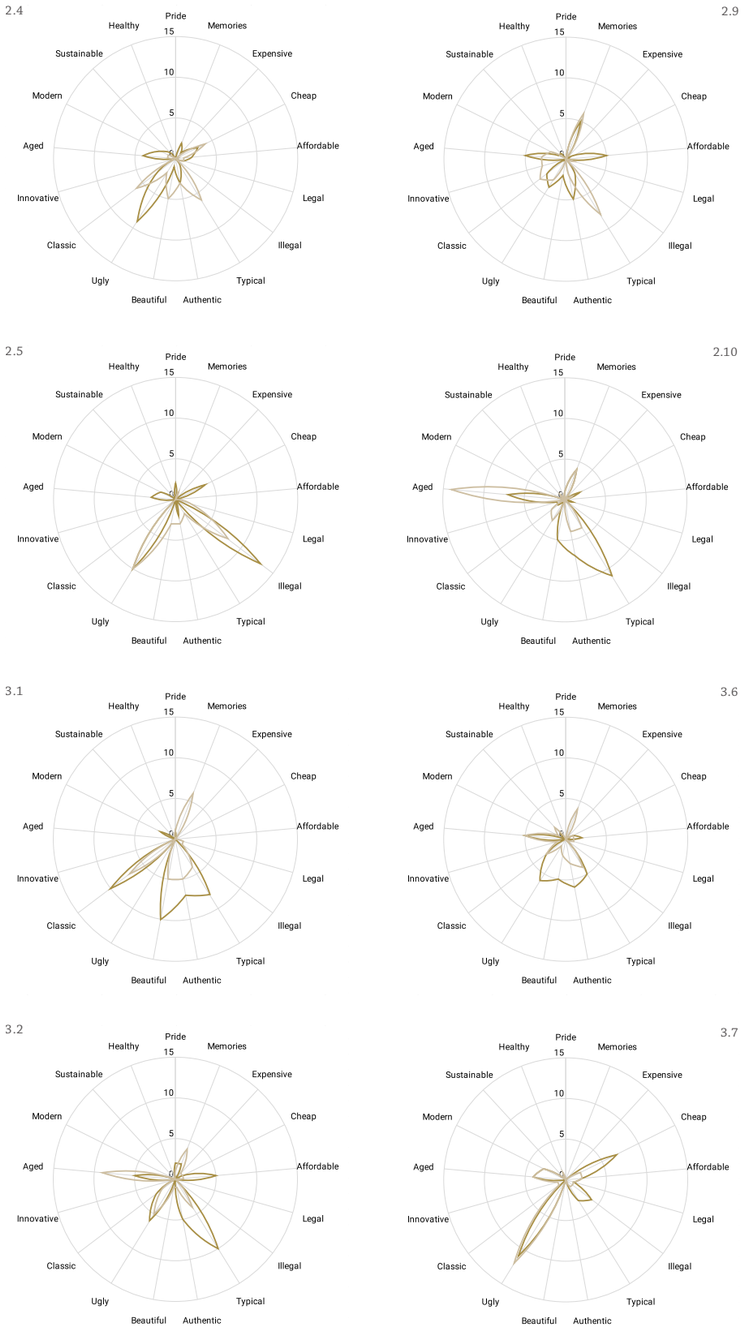


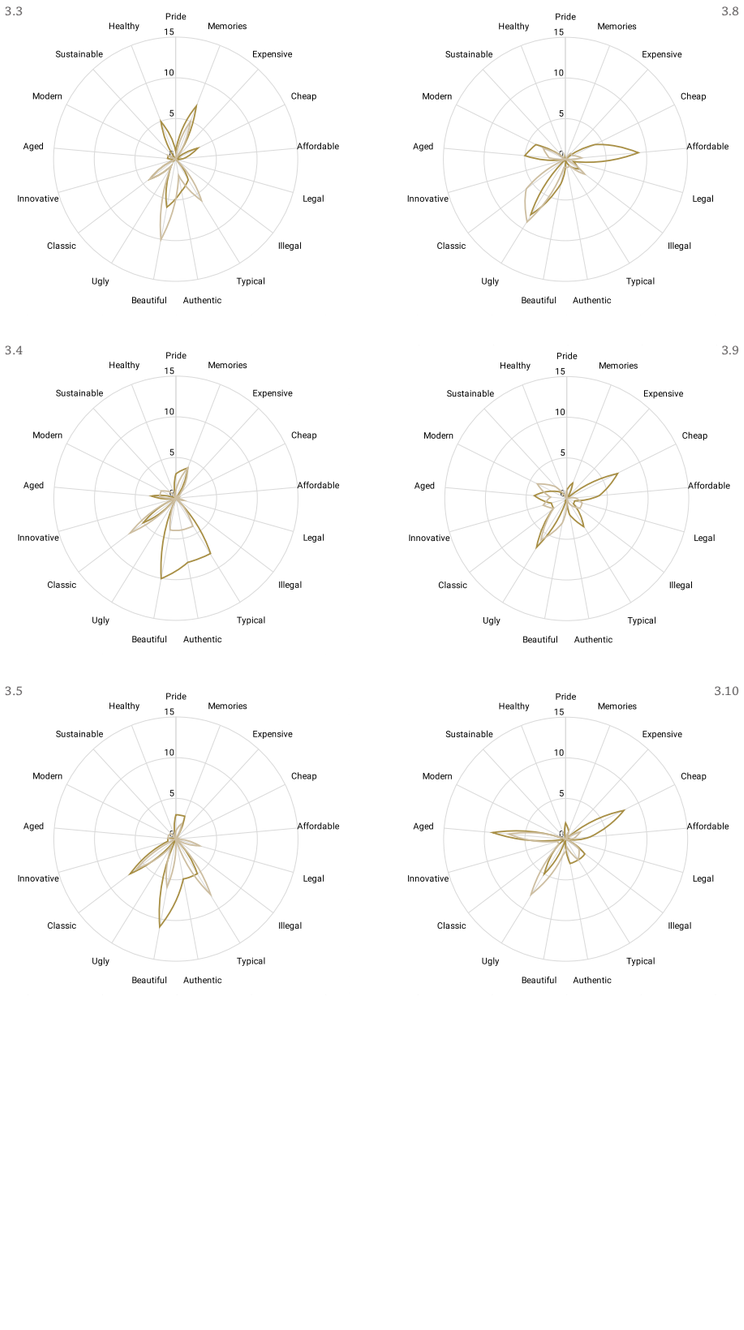
Tourist

Locals

1.3 RESULT

Figure 4. Game-result graphs





Tourist

Locals

1.3 RESULT

1.3.2 Game-result graphs

As values in the game were connected to contradicting hashtags, it is also important to find results on the opinions conveyed by these hashtags. Therefore, the attributes have been grouped into categories and will be discussed in the following paragraphs which conclude information that is shown in figure 4.

Street (figure 4, picture 1.10, 2.10 and 3.10)
The streets with original typologies are generally seen as elements that have been there for many years and are unpleasant in appearance, except for the tourists who find the two door typology as beautiful. The picture of the street with newer buildings is generally perceived as unpleasant in appearance, relating it with new tendencies but yet is perceived as typical for Faro.

Street accessoires (figure 4, picture 1.5, 2.5 and 3.5)
The street art in this group has a very different result from the game. On one hand, the simple lined batman was perceived as an unpleasant element and not complying with the law. On the other hand, the decorated snake graffiti was seen as a modern element in the neighborhood and the opinion of its legality was divided.
The lantern that is hanging from facades throughout the entire neighborhood was in general perceived as an element that provides a pleasant and attractive look to its surroundings and has the expected characteristics for it.

Greenery (figure 4, picture 1.3, 2.3 and 3.3)
The unanimous opinion regarding the greenery in São Francisco pointed at two concepts: the attractive looks it provides and the encouragement of good health. Furthermore, the facade flower pots are seen as a classic element of the buildings in the neighborhood and are attached to memories.

Facades (figure 4, picture 1.2, 1.8,2.2,2.8, 3.2 and 3.8)
Divided into two categories the original typologies and the new typologies. Both groups are representative of the facades in São Francisco and are differently perceived by both study groups. From the original typologies with their plastered facades the general opinion points at a traditional and expected look in the neighborhood as well as an element that has been there for a long time. While the new typology is seen by both groups as unpleasant in the way it looks and recent in the way it has been built. Also, tourists see it as a more affordable option.

Doors (figure 4, picture 1.1, 1.7, 2.1, 2.7, 3.1 and 3.7)
The wooden doors are regarded as an authentic element for both groups. Typical and connected memories. Beautiful in some way with slight differences between locals and tourists. Among the two metal doors reviewed by the game the differences are perceived from the point of view of the aged look. While the rusted metal door is seen as a classic element, the modern aluminium door is in general perceived as ugly.

Windows (figure 4, picture 1.9, 2.9 and 3.9)
The three window pictures are subdivided into the material they are made of: wood and aluminium. Regarding the wooden frame it gave the impression of an element that has been there for a long time, traditional but yet simple in style. In comparison, the aluminium shutter and the frame have divided opinions about them, only agreeing on the affordability it displays. The shutter is seen as an element that brings memories in general. For locals it's a traditional element of the neighborhood compared to the frame which is seen as unpleasant in the way it looks.

Tiles (figure 4, picture 1.4, 2.4 and 3.4)
In this category the difference is shown between the patterned tiles (blue and brown) and the gradient tile. The opinion about the patterned tiles stands out with the pleasant and attractive, along with this the perception was an element that has been there for a long time and belongs therefore in the neighborhood. In contrast with these opinions, the gradient tile is generally regarded as a cheap element but the opinion is divided regarding its looks. Tourists see it as an aged element unpleasant in appearance while locals see it as a typical feature of which they like the way it looks.

Building details (figure 4, picture 1.6, 2.6 and 3.6)
Regarding the details of buildings, the results of the game show results about the appearance of the walls. On one hand, both the brown wall and the colored one are seen as an aged element and seem to have an unpleasant appearance for both groups. Although for the tourists, the colored facade is also seen as a beautiful detail. On the other hand, the white wall was divided but points at a general opinion focused on the simple but traditional style. For locals it is very much seen as an element that is typical for this neighborhood.

1.3.2.3 Neighborhood facade analysis per plot

By having the common attributes in the neighborhood valued, all facades in the neighborhood can be analysed and categorised. Facades with similar appreciations are grouped according to their represented values. An example of this process will be shown using a specific plot and the pictures from the research attached to it (figure 5). Each attribute carries the result information which feeds this part of the analysis. By setting a parameter from which to measure each attribute the value from it can be measured and compared to other plots. The facade appreciation map summarising these results can be seen figure 6.



Figure 5. Analysis example

highly appreciated low appreciated

Figure 6. The facade appreciation map

1.4 CONCLUSION

The comparison between two different communities that share the same space in different time frames adds another layer of value that this paper sought to research. The values, derived from Tarrafa and Pereira Roders (2012) attached to facade attributes in the neighborhood of São Francisco, used in the game 'o jogo de palavras', provide a deeper overview on how the neighborhood could develop forwards. By setting up a matrix (figure 3) that crosses information from attributes and values, which are the key for the next step, enabled the translation of the results into design guidelines. An example of the agreements between both groups is the lower aesthetical value given to more modern buildings. This seemingly irrelevant argument comes hand in hand with the authenticity regarded to older looking attributes.

These different dimensions of the city are more complex than an array of attributes with a scale of importance. **Therefore a masterplan was set up to take all these criteria into account and make them more applicable**

Different zones and criteria have been defined (table 3) following the results of the values conveyed by locals and tourists. These results combined with the insights that the facade appreciation map (figure 6) provide the base for the masterplan (figure 7).

As the result showed, the older facades were valued as representative for the neighborhood and generally valued more positively compared to the newer typologies. Therefore areas where the facades need to be conserved have been determined and are shown in green in the masterplan (figure 7, on the next page). These are mainly found in the old typology facades which are generally marked by both groups as traditional and aged buildings for São Francisco.

Areas with potential have been marked on the map in orange, these partially consist of the old typology buildings that have not been maintained in a representative state and perceived as aged and ugly, therefore having potential for redesign. The other part of the buildings marked with potential are the few old typology buildings remaining in the highrise area.

The newer typology buildings were all notably higher than the older typologies and concentrated in a specific area in the neighborhood. Since the results showed that these typologies were not liked by both target groups, a building height restriction area, in the dotted blue line, has been marked on the map dividing Sao Francisco in two parts with the goal to prevent these newer typologies to spread further through the neighborhood. As a result the outline of this area, where higher buildings are allowed, only outlines the buildings in the neighborhood that are already three stories or higher. Allowing for development of the buildings marked with potential, described in the previous recommendation, while not expanding this zone.

Street art with simple drawings is perceived as "ugly", but decorated graffiti is seen as a more positive and modern attribute. Decorated graffiti can therefore be encouraged but limited to specific areas, shown in light blue, to improve the outlook of some areas without messing with the image.

Concluding the opinions of locals and tourists, other guidelines for this neighborhood can also be set.

These consist of:

- In general the wooden doors are regarded as beautiful and authentic and appreciated more by the locals and tourists than the metal doors which are perceived as aged and ugly. Therefore wooden doors should be used in this area.

- Wooden windows are seen as a traditional style. The aluminium windows are seen as more affordable. Therefore wooden window frames would be recommended.

- The patterned tiles are seen more as pleasant and attractive, in contrast to the gradient tiles which are seen as a cheap element. Therefore, the patterned tiles are recommended to be used in Sao Francisco.

- Facade greenery is generally liked and conveyed as healthy. Therefore, this is an attribute that is encouraged.

- In general, lanterns are seen as pleasant elements throughout the neighborhood and should therefore be conserved and added if needed.

Avoid	**Conserve**	**Potential**
Spread of new typology facades through the neigborhood	One level facades from original typologies.	Original typology buildings that have not been maintained in a representative state.
Metal doors	The highrise area along and around Rua D. Teresa Ramalhão Ortigão.	Decorated graffiti can be encouraged but limited to specific areas.
Aluminium windows	Patterned Tiles	Facade greenery
	Original street lanterns	Street lanterns

Table 3: Recommendation overview for São Francisco

highrise area
Potential
Conserve
Opportunity for street art







Figure 7. The Masterplan

1.5 DISCUSSION

To strengthen the methodology used in this paper, a broader sample of questionee's could be used along with different dates through the year since the scope of this research was determined by the fieldwork period established by third parties.

While this research mainly focuses on the facade attributes in the São Francisco neighborhood, the same method could be applied to other attributes such as nature, place attachment and urban equipment to have a more accurate overview to aid the development of a more inclusive and acceptable masterplan.
The same methods can be used in other neighborhoods in Faro where tourism is present in a notable amount. These neighborhoods could be Estacao, Sao Luis, Vila Adentro, Riberinho and Mouraria as they, just like Sao Francisco, experience the same situations regarding growth in tourism, housing pressure and heritage conservation laws. Furthermore this method does not only apply to Faro but to any city where tourism interacts with local heritage.

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Chapter 02

A LUZ NA CASA

Designing the values of Faro's heritage

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CHAPTER 03

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A Luz na Casa

"the light in the house"

2.1 INTRODUCTION

Heritage provides clues from our past and how our society has evolved. It helps us examine our history and traditions and enables us develop an awareness about ourselves. It helps us understand and explain why we are the way we are. Heritage is important because it shapes our **identity**, our heritage becomes part of what we are. Our expression of this identity shows others what we value; it highlights our values and priorities.

"Heritage is what we have inherited from the past to value and enjoy in the present, and preserve and pass on to future generations".

A heritage project can be much more than just **preserving and protecting** the past. To encourage local communities to take responsibility for conservation of their heritage will make them more involved. This will generate a greater sense of pride and belonging in the local area through increased participation and will encourage tourism.

By redesigning based on values...

... of the community

The values of heritage were researched in THE FIRST SEMESTER of this graduation studio working on site in Faro, Portugal. This research and the results are explained in the first chapter of the graduation book. THE SECOND SEMESTER is about designing based on these researched values. The redesign will be explained in this chapter.

The values derived from Tarrafa and Pereira Roders (2012) attached to facade attributes, provided a deeper overview on how the neighbourhood could develop. By crossing the information from attributes and values it will enable the translation of the results into design guidelines for the redesign. This redesign will explore ways to let the heritage of Faro still be present, but also be able to adapt to the current needs of the locals and tourists neighbourhood.

2.2 VISION

The vision for the redesign is to **preserve and protect** the heritage of Faro in the neighbourhood of São Francisco. Besides this it is also important to encourage the locals and tourist to be more involved in the heritage. Therefore the redesign should be thinking as much about the heritage as of the people and their opinions. That is why the redesign will be based on the values of the people in Faro.

In the redesign the different values between the two communities: locals and tourists, were researched. Both of the communities do not have that different opinions, but because the locals are going to live in the building their values would be taken more into account. Tourists values will be kept in mind to attract and encourage tourism in Faro.

Locals and tourists emphasize the values of the locals

To achieve this goal, 3 goals have been set:

The first goal will be to make a redesign based on the values, researched in the first semester. These values are used in the redesign by applying the design guidelines of the research into the building. The research was based on attributes of the facade and this is where the value based redesign will be further elaborated on.

In the conversation with an employee of the municipality of Faro, Patricia Malobbia, it emerged that the locals had great difficulty buying houses due to the very high prices of the housing market. In addition, another problem is that there are currently few houses available on this market. This is a increasing problem, which caused many locals to move out of the old town. Because of this, **the second goal** is to design affordable and more houses.

The last goal is to protect and preserve the heritage for future generations and making this building future proof.

These tree goals combined will be create the redesign for the graduation studio revitalizing heritage.



Design Based on Values

"In the sphere of cultural heritage, the preservation values are critical deciding what to preserve and how"



More and Affordable Housing

"Relieve tension on the housing market and lack of affordable housing"



Future Proof

"Protect and preserve heritage for future generations"



Redesign of Built Heritage

Site Selection

2.3 SITE SELECTION

2.3.1 São Francisco

The research was conducted in the old neighbourhood of São Francisco, a neighbourhood in Faro. This neighbourhood is located on the east side of the historic city centre and consist mainly of housing (historic houses or apartments). The monastery's church Igreja de São Francisco is also located in this district. This church was build in 1679 and during the 18th and 19th centuries it was enlarged.

In figure 1 the neighbourhood of São Francisco can be seen.

São Francisco



Figure 1. the neigbourhood of São Francisco

2.3 SITE SELECTION

2.3.2 Masterplan

In the previous chapter a masterplan was set up to take all the researched criteria into account and make them more applicable. In the masterplan (figure 2) different zones and criteria have been defined following the results of the values conveyed by locals and tourists. In the masterplan four different areas are shown, see legend.

Areas with potential have been marked on the map in orange. These areas partially consist of the old typology buildings that have not been maintained in a representative state and perceived as aged and ugly, therefore having potential for redesign.

- Potential
- Conserve
- High rise area
- Opportunity for street art

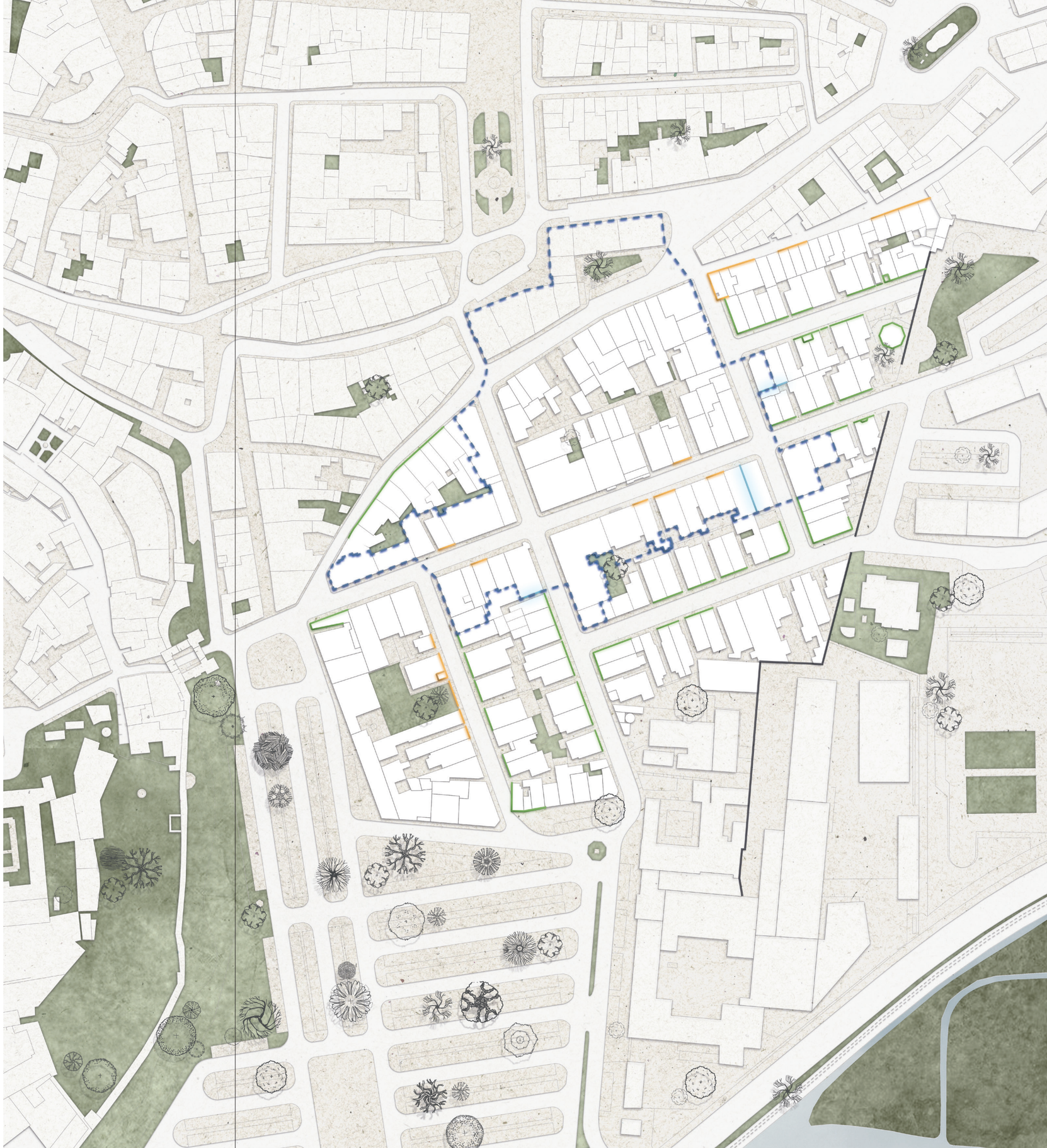


Figure 2. the masterplan

2.3 SITE SELECTION

2.3.3 The Plot

Each group member has selected their potential area for redesign on the basis of this masterplan.

One of these plots where Rua do Bocage 104 & 106 (purple area, in figure 3). In the site survey the term aged was used a lot in combination with ugly and cheap. This is how it was concluded that the aging process was not pleasing.

The plots where also a nice example because the facade had two of the tree old typologies of Faro's Heritage. So, the intervention could be an example for other similar redesign in the area.

Roy

Krist

Emisgul

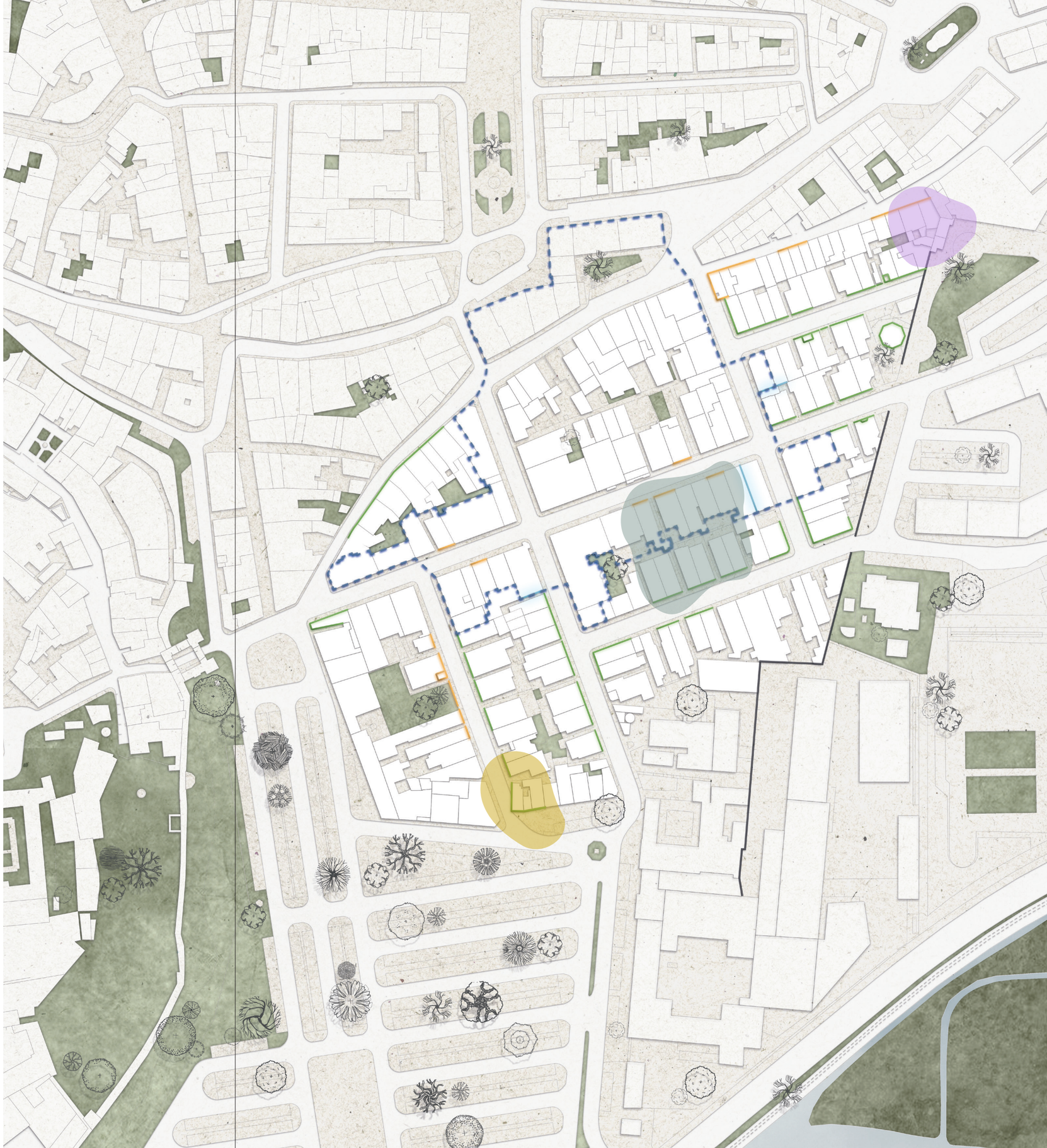


Figure 3. site selection

2.3 SITE SELECTION

2.3.4 Rua do Bocage

In figure 4, the total length of the street Rua do Bocage can be seen. This is a very long street that starts by the historic city walls, on the east side of the historic city. This wide street then turns slowly into a narrow street. In the middle of this street, on the corner of the neighborhood of São Francisco, is the plot chosen for the redesign of this graduation studio Rua do Bocage 104 and 106.

Pictures of the facade can be seen in figure 5, on the next page.



Figure 4. Rua do Bocage
retrieved from https://www.google.com/maps/











Figure 5. Pictures of Rua do Bocage 104 and 106
retrieved from https://www.google.com/maps/

facade

2.4 FACADE

2.4.1 Facade redesign strategy

The redesign strategy for the houses is derived from the research in the first chapter. The research was about how the attributes on the facade of the neighbourhood of São Francisco where valued. This concluded in design guidelines.

Goal
first goal redesign based on values

The goal is **to improve the valuation** of the facade with the redesign.

By analysing the facade it is possible to see how the facade is valued now and which design guidelines to use for the redesign. The facade analysis will be made by comparing the pictures of the site survey: **'O jogo de palavras'** with the façades. The positively valued attributes will be preserved on the facade and the negatively valued attributes will be improved.

There is also a possibility to add positively valued attributes to the facade to increase the value. In figure 6 the front facade of Rua do Bocage 104 and 106 can be Seen. The plot exist of 2 buildings next to each other and one building behind, which is connected to Rua do Bocage 106.



Figure 6. front facade of Rua do Bocage 104 and 106

2.4 FACADE

2.4.1 Facade redesign strategy

Figure 7 shows, the rear facade of Rua do Bocage 106. This part of the building is not located in the neighbourhood of São Francisco and has a total different typology. This can be seen on the site plan in figure 8. To make this building a whole with the front facade and to show that they are all connected, it will have the same facade attributes as Rua do Bocage 106.

It is striking that Rua do Bocage 104 and 106 both have almost the **same facade appearance**, like if they are twins. They have the same windows, almost identical doors, both plastered in white and a light grey accent at the bottom. This similarity will also be preserved in the redesign.

site plan
on the next page,
figure 8

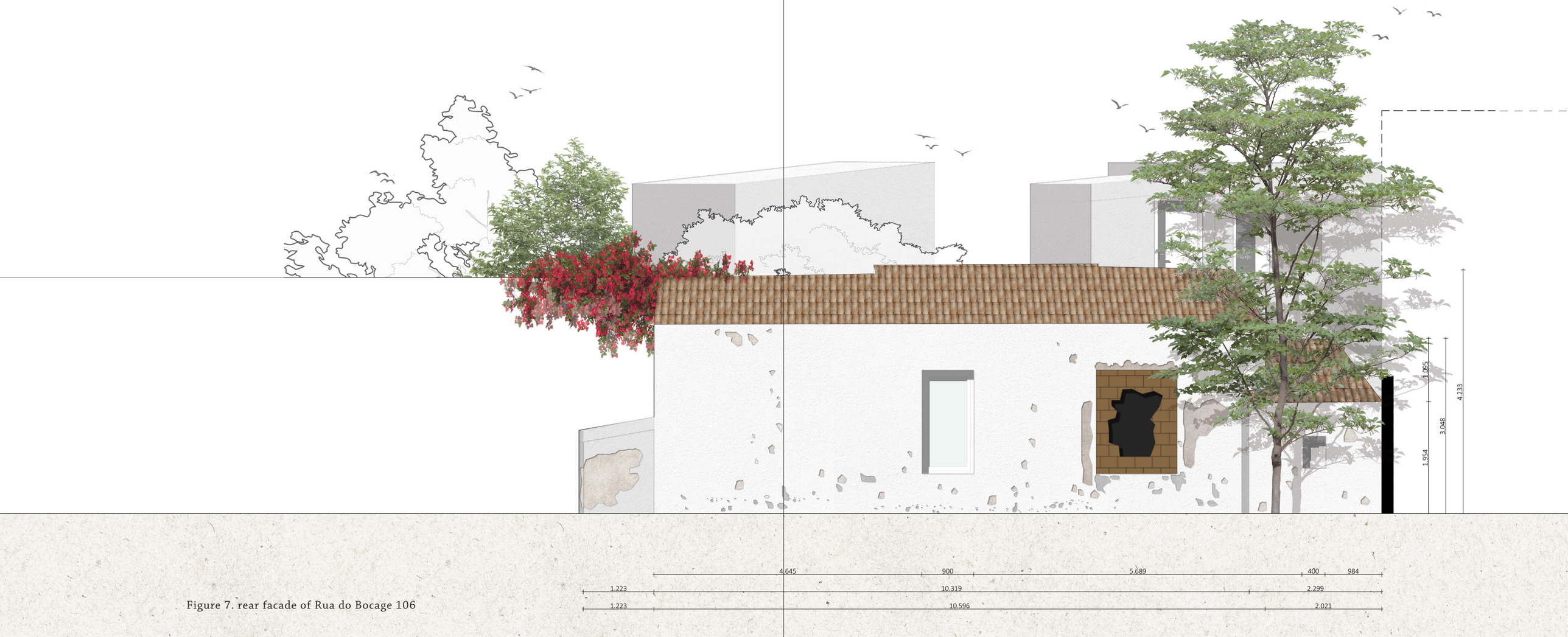


Figure 7. rear facade of Rua do Bocage 106



Figure 8. site plan of Rua do Bocage 104 and 106

SCALE 1 : 2000

2.4 FACADE

2.4.2 Facade analysis

Valuation
each attribute has a positive, neutral or negative influence

In this paragraph the facade of Rua do Bocage 104 and 106 will be analysed, figure 9 The analyse will be based on the words (hastags) that are classified into three categories: **positive, neutral and negative**. This was done during the research and can be found in appendix 3 containing all the results from the site survey: 'O jogo de palavras'.

Positive words have a positive influence on the valuation of the facade. Neutral words are generally seen as no influence at al or as a positive and negative influence on the appreciation of the facade. Negative words are seen as having a negative influence on the appreciation of the facade. Each word has it own score where 0.0 is the least appreciated attribute and 1.0 the most liked, 0.5 is neutral.

The words that have been classified into three categories:

Positive	**Neutral**	**Negative**
Pride	*Memories*	*Expensive*
Affordable	*Typical*	*Cheap*
Legal	*Innovative*	*Illegal*
Authentic	*Sustainable*	*Ugly*
Beautiful		*Aged*
Classic		*Modern*
Healthy		

Pictures matched to Rua do Bocage 104:

1.1 - Rusted metal door	*0,40*
2.2 - Single door & two window facade	*0,57*
1.6 - Dirty window and damages wall	*0,00*
1.9 - Wooden window frame	*0,83*
3.10 - One story building street	*0,20*

Pictures matched to Rua do Bocage 106:

1.1 - Rusted metal door	*0,40*
1.6 - Dirty window and damages wall	*0,00*
1.9 - Wooden window frame	*0,83*
3.10 - One story building street	*0,20*

According to this Facade analysis the following design guidelines (from chapter 01) are recommended to improve the facade appreciation:

- Wooden doors are more appreciated then rusted metal door, therefore wooden doors should be used in this area.
- Wooden windows are the most appreciated, but not if it is damaged. Therefore the wooden window should be preserved, but restored.
- Maintain the neglected original typology buildings in a representative way.

Also according to the Facade analysis the following design guidelines (from chapter 01) are recommended to positively increase the appreciation for both facades:

- Facade greenery is really appreciated and therefore it is an attribute that is highly encouraged.
- Lanterns are seen as a pleasant element and should be added if needed.

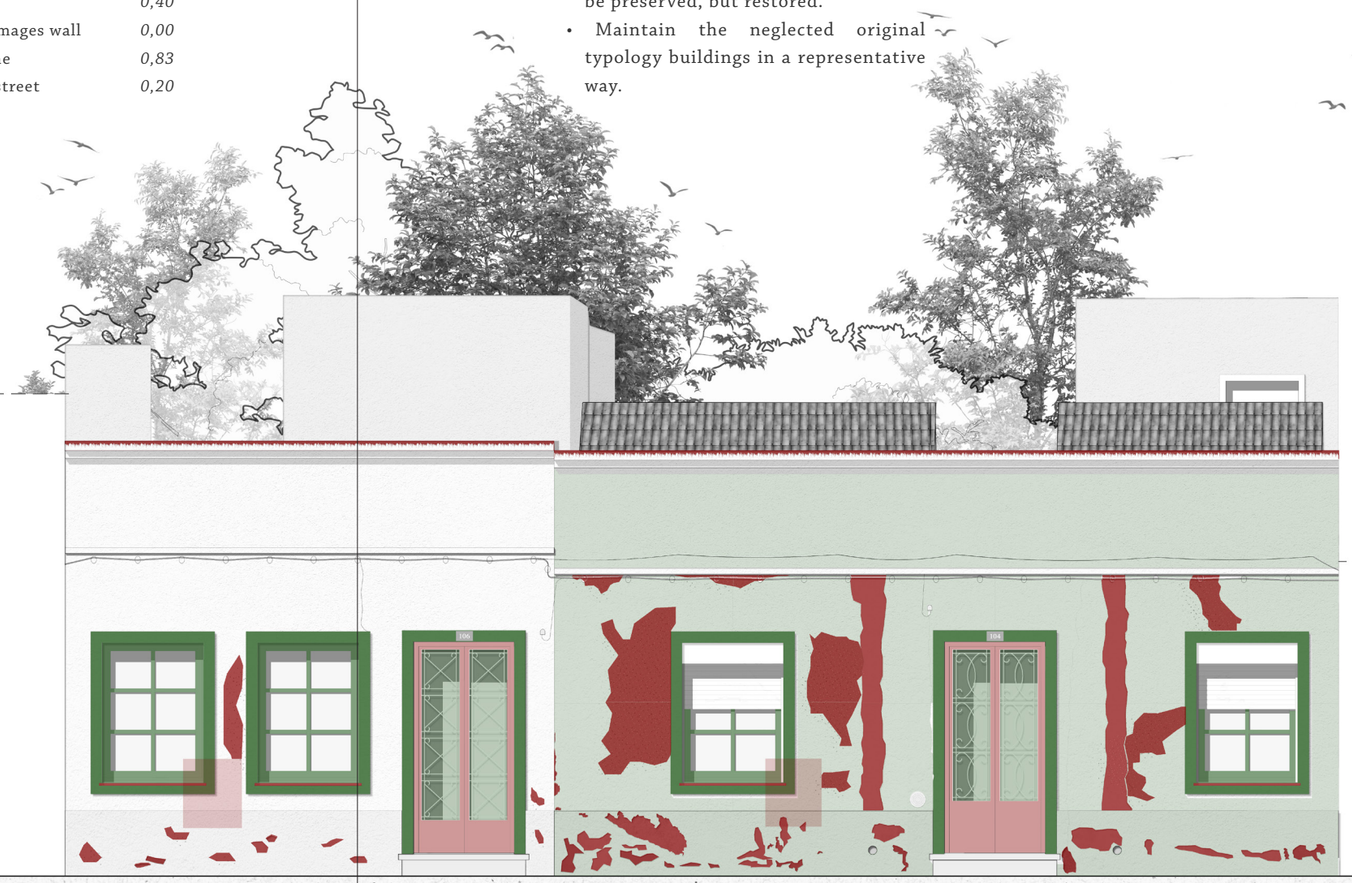


Figure 9. front facade of Rua do Bocage 104 and 106

2.4 FACADE

2.4.2 Facade analysis

Values

Rua do Bocage 104

Images
The images can be found in appendix III. Game-result table

Rua do Bocage 104 matched the images: 1.1, 2.2, 1.6, 1.9 and 3.10. Based on the relevant attributes per facade, it was calculated what percentage of which hash tag occurs in the facade. Figure 10 shows how the locals, tourists and both of them in total describe the façade.

The diagram shows that the opinions between locals and tourists are similar in general. There are a few exceptions where it doesn't quite match, for example with the hash tag cheap or ugly.

In this diagram it can be seen that the words aged, ugly and cheap are very prominent, which shows that the facade is not much appreciated. In contrast, the words typical, authentic and classic say that the facade of origin is a very strong representative for Faro's facade and has potential to enhance a better representation of the historical character.

All the hastags are connected to certain values of the research by Tarrafa and Pereira Roders (2012). Based on the percentage of hastags used on the facade the frequency of each value was calculated, figure 11. It is certain that the highest connected values are historic, age and aesthetical.

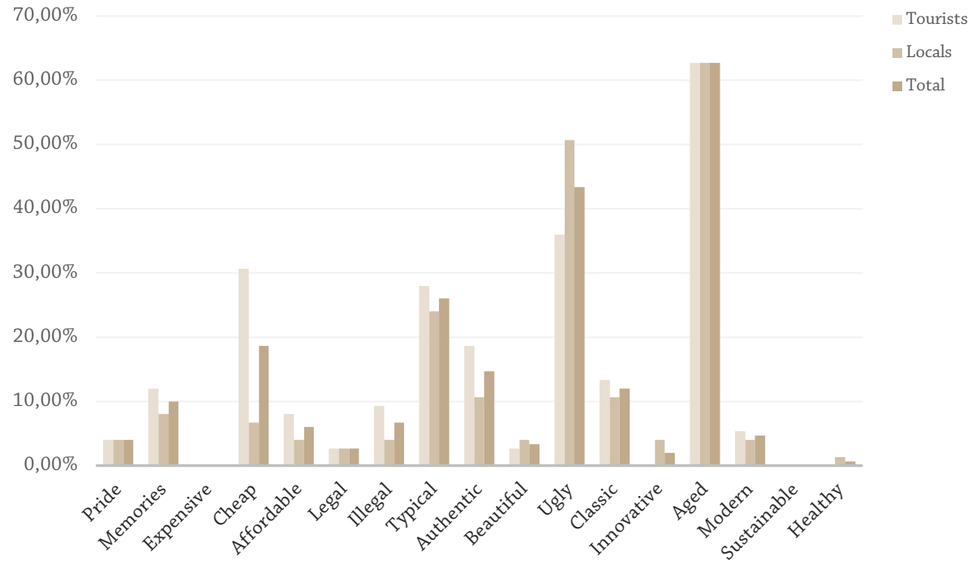


Figure 10. hash tags of Rua do Bocage 104

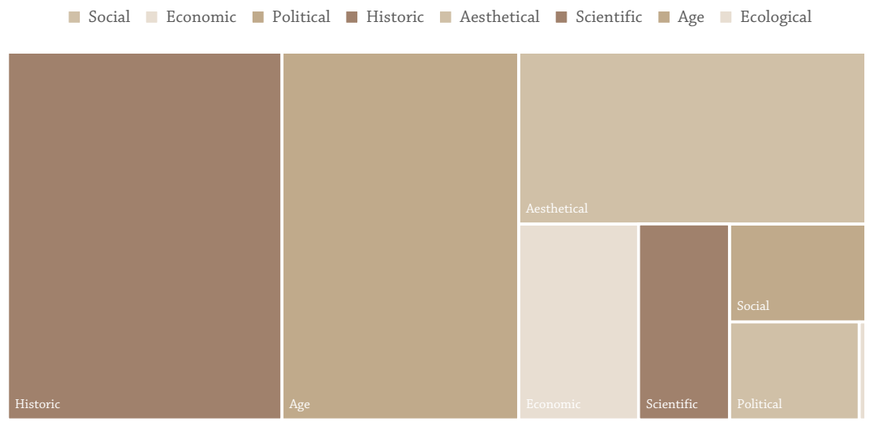


Figure 11. value chart Rua do Bocage 104

2.4 FACADE

2.4.2 Facade analysis

Values

Rua do Bocage 106

Images
The images can be found in appendix III. Game-result table

For Rua do Bocage 106, the images 1.1, 1.6, 1.9, and 3.10 are relevant. Figure 12 shows how the locals, tourists and both of them in total describe the façade.

The diagram shows that the opinions between locals and tourists differ in general. At Rua do Bocage 104 there were more similarities between locals and tourists.
In this diagram it can be seen that the words aged, ugly and cheap are very prominent, which shows that the facade is not much appreciated. Because aged and ugly are combined, it is taken from this that it has not aged pleasant. In contrast, the words typical, authentic and classic say that the facade of origin is a very strong representative for Faro's facade and has potential.

Based on the percentage of hash tags used on the facade the frequency of each value was calculated, figure 13. It can be concluded, that the highest values are historic, age and aesthetical. As mentioned before the façades have similar attributes. As a result, they also have a very similar outcome in the analysis of the hash tags and values.

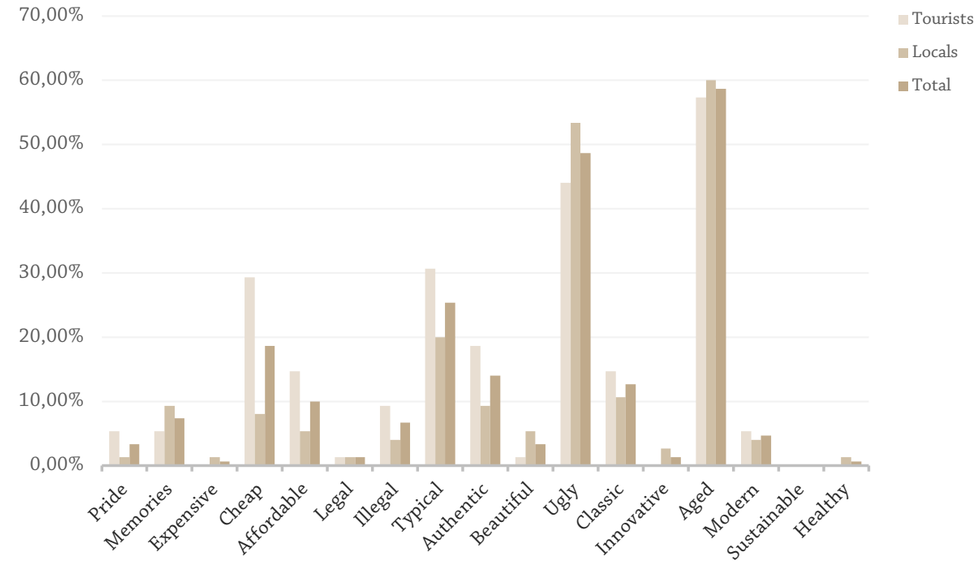


Figure 12. hash tags of Rua do Bocage 106

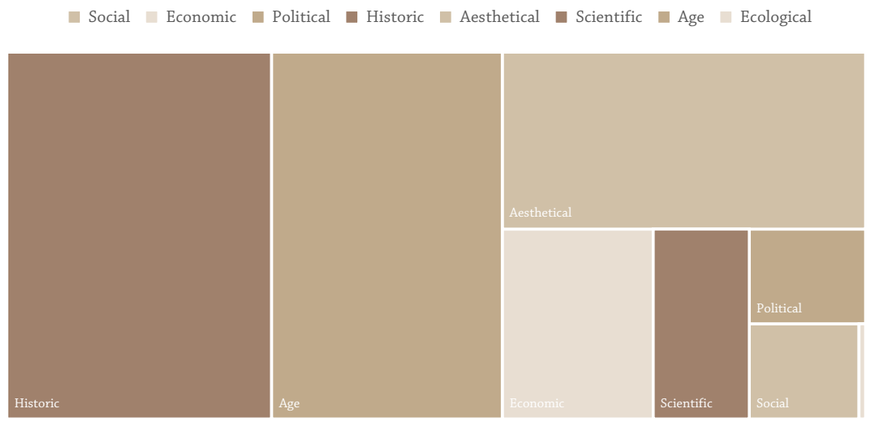


Figure 13. value chart Rua do Bocage 106

2.4 FACADE

The façades of Rua do Bocage 104 and 106 have some damage on the surface, figure 14 and 15.

Dotted Structure
The dotted areas in the are due to the salt in the facade, which causes the stucco to crumble a bit.



Stains of moisture
At the bottom of the plinth, stains can be seen in the facade. These spots come in two different kinds of grey colours that show that the moisture accumulates. The salt in the soil penetrates the walls and shows up on the surface.



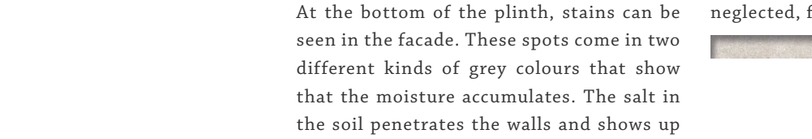
Light orange spots
These are spots on the facade in which the white paint can no longer be seen due to aging. The paint has faded away and needs to be repainted. This is especially visible on the rear facade where it is almost not maintained and the facade is very neglected, figure 14.



Dark orange spots
On the facade there are a few areas where the stucco has completely crumbled and the structure behind the stucco can be seen. These pieces need to be re-plastered and painted to recover the damage.



Cables and wiring
The cables and wiring hanging in front of the facade give it an unpleasant look. The horizontal white accent on the facade will be replaced by a slightly thicker accent. Because behind the accent, a thin line of cables and wiring will be milled into the facade.



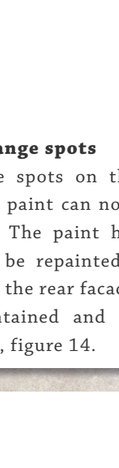


Figure 14. damage analysis | front facade

2.4 FACADE

There are different options to repair the damage through salt on the facade.

1) Sacrificial plaster: using an open material, such as stucco, will absorb the salt in the facade. As a result, salt is sucked out of the facade and the damage is only in the plaster. This plaster will have to be replaced every 5/6 years, to keep the salt out the structure, and is therefore used as a sacrificial plaster. For example, this material can be hydrologic lime plaster, this is a strong and open material that breathes and has a whiter in colour.

2) Removing salt: By removing the salt from the wall it prevents forming stains on the facade, but this is a very invasive and expensive intervention. In addition, it is also not as effective as it will only remove the first five centimetres of salt in the wall.

After consultation with Barbara Lubelli (a scientist on buildings materials), it emerged that the damages were not severe enough to use solutions such as a sacrificial plaster or removing salt from wall.

Instead, she recommended that it needed more maintenance and some architectural changes that could prevent more moister.

3) Maintenance: The facade needs to be maintained every few years. The facade is plastered with lime plaster. By doing the plaster once again with a hydroligic lime plaster which is absorbent and not water repellent. This plaster will absorb the salt over time and bring it to the surface. According to the Portuguese regulations this needs to be replaced every 8 years. Also, painting the facade every few years can resolve some of the damages. A paint without colour and latex is recommended.



Figure 15. damage analysis | rear facade

2.4 FACADE

4) Prevent: By applying simple architectural adjustments the moister from outside can be prevented. The plinth has to much stains. By making the sidewalk on a angle, the rainwater has fewer contact with the plinth (figure 16). Also the plinth is not made of limestone plaster but from concrete, this will damage rapidly. By replacing the concrete plinth a with hydroligic lime plaster it should take longer for the salt to effect the facade.

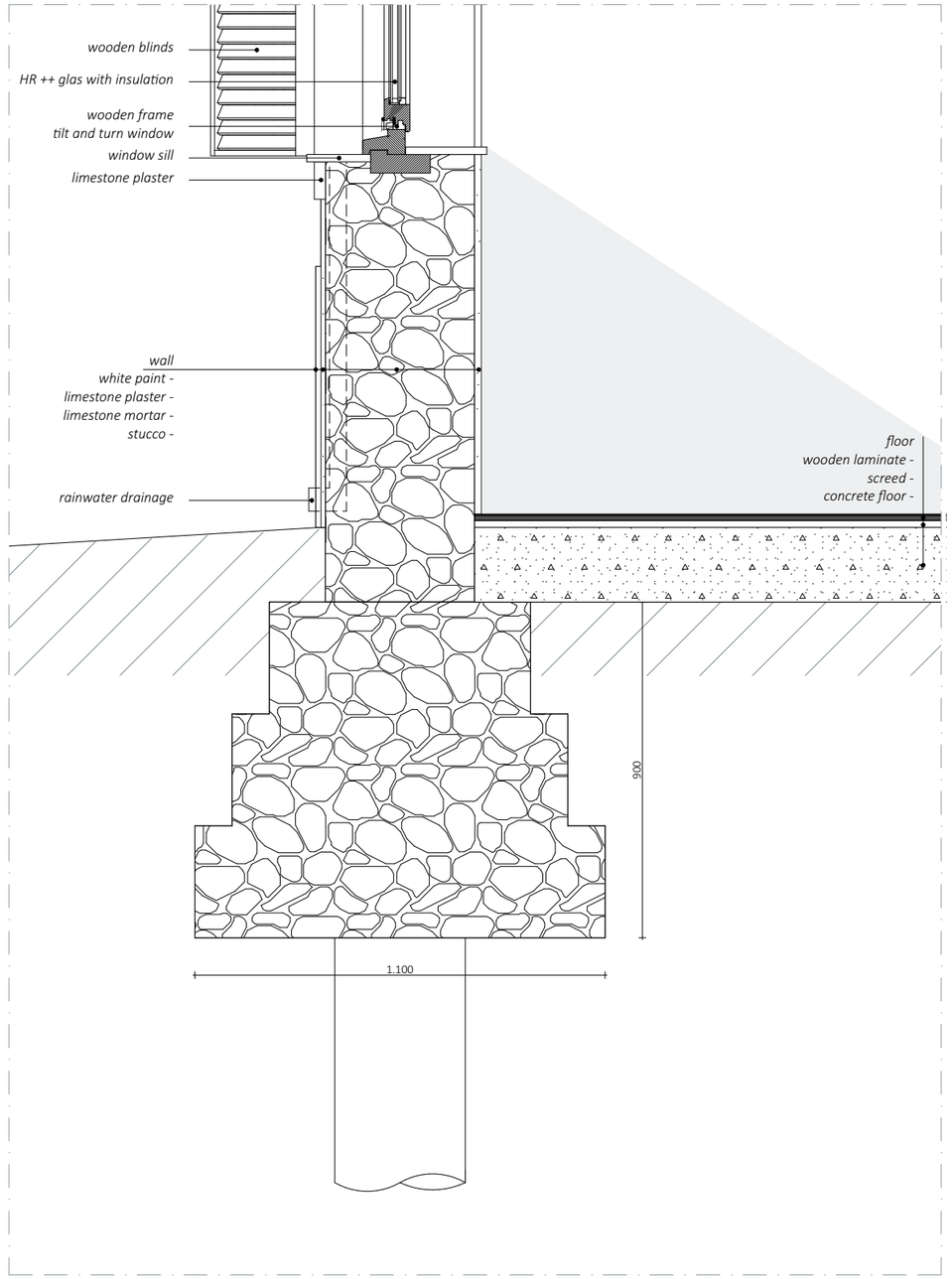


Figure 16. detail of the foundation

2.4 FACADE

2.4.3 Facade redesign

The door

Rua do bocage 104 and 106 have a similar looking rusted metal door. The rusted metal door was not very appreciated, instead a wooden door is much more appreciated. Therefore, in the facade analysis the design guidelines recommended a wooden door. The original rusted metal door is also a dirty and damaged door. Therefore, it will be replaced by an wooden door, but within the original Portuguese character. The old traditional Portuguese doors were then analysed, see figure 17. The door in the example was a door used a lot in São Francisco, Faro.

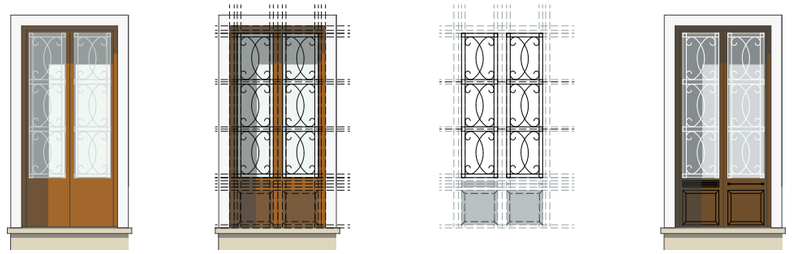
The wooden doors are redesigned in the same grid as the original doors. This way it could retain its character and does have a link with the past design. Also by using the same measurements, the metal frame on the doors can also be reused on the new doors and there is also less waste of material, figure 18.

Figure 17. Portuguese wooden door analysis

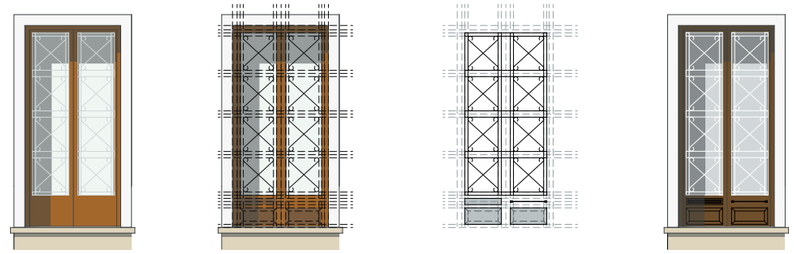


Figure 18. The redesign of the doors

Rua do Bocage 104



Rua do Bocage 106



2.4 FACADE

Design guideline
Chance rusted metal door into wooden door

The redesign of the doors in the facade can be seen in figure 19. A glass top-light and wooden accent above the glass window is normally usual in the Portuguese doors, but it would not fit the design nor the hight of the original doors. Therefore this detail is left out of the redesign.



Figure 19. The new doors in Rua do Bocage 104 and 106

2.4 FACADE

The window

In the facade analysis it was concluded that the wooden windows are appreciated, but the current wooden windows in Rua do Bocage 104 and 106 are very damaged and old. Therefore will be restored with a newer wooden window, with the same measurements. Adding a more durable window also makes the building more sustainable.

Design guideline
restore wooden window

The old wooden frame will be recycled into a new frame. In the new frame, wood is used from sustainably managed forests with the FSC or PEFC quality mark. The glass becomes heat-resistant glass to block the heat from the sun. The HR++ glazing already has good heat insulation in itself. Heat-resistant glass, has an extra coating on one side in the cavity, so that a lot of heat is blocked (figure 20). This also prevents that furniture and curtains fade in colour. In addition, the cavity of the double insulating glass is filled with insulating argon gas filling (warmtewerend glas, z.d.) The same old grid will be used in the new windows. But the new windows can be turned and tilt for night ventilation.

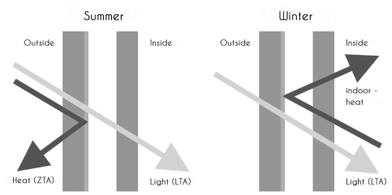


Figure 20. Heat-resistant glass: cool in summer, warm in winter

Wooden shutters are used as blinds. This is an traditional element which is used a lot in the neighbourhood. The blinds can be folded in the middle because the spacing between the windows is to narrow. The colour of the blinds is a natural wooden colour, like the natural materials inside the house.

The redesign of the windows in the facade can be seen in figure 21.



Figure 21. The new windows in Rua do Bocage 104 and 106

2.4 FACADE

Lantern

Design guideline
adding lanterns

The lantern that is hanging from façades throughout the entire neighbourhood is an element that provides a pleasant and attractive look to its surroundings. Therefore, the design guidelines recommended a lantern if it is needed.

The façades of Rua do Bocage 104 and 106 both have no lanterns. There are only four lanterns in the whole street. Three of the four lanterns are too far from the building to illuminate. Then one lantern needs to light up a length of 43 meters. Also, the problem is that this lantern is just a bit too far and because of this the shadow of the building next to it falls on the facade of Rua do Bocage 106. Thus can be seen in the street analysis on the next page, figure 22.

To illuminate better the street, especially for the dark corner in front of Rua do Bocage 106, lanterns are added to the facade.This characteristic Portuguese lantern (figure 23) is added to Rua do Bocage 104 on both sides of the door to maintain symmetry on the facade. Rua do Bocage 106 does not have space for a lantern, but the two lanterns of Rua do bocage 104 will be enough (see figure 24).



Figure 23. Portuguese lantern, picture taken in São Francisco, Faro



Figure 24. lanterns in Rua do Bocage 104 and 106



Figure 22. street analysis Rua do Bocage

2.4 FACADE

Greenery

Design guideline
adding greenery

The facade of Rua do Bocage 104 and 106 have no greenery on the facade. Greenery is an positively valued attribute. It is seen as beautiful, authentic, and healthy. Therefore, this is an attribute that is encouraged in the redesign guidelines from chapter 01.

There are different types of greenery that can be added to the facade. In the neighbourhood of São Francisco there are green bushes, flowers, flower pots and hanging ivy's. The sidewalk in front of the houses is a car way and sometimes cars park here. Therefore, it is not wise to plant bushes or flowers in the ground. They will be damaged by the cars and are hard to maintain. Flowerpots next to windows are really appreciated, but because Rua do Bocage 104 has the lanterns and Rua do Bocage 106 is to small there is no more space between the windows.

The top of the facade has almost no detail and consists of a long white strip. Normally, this part is decorated in São Francisco, but not for Rua do bocage 104 and 106.

This creates an opportunity to decorate this with greenery. For instance, ivy's which are seen a lot in the neighbourhood, picture 25. By placing planters on the inside of the eaves, the ivy's can grow here and hang over the eaves as decoration, see figure 26.



Figure 25. Portuguese ivy's, picture taken in São Francisco, Faro

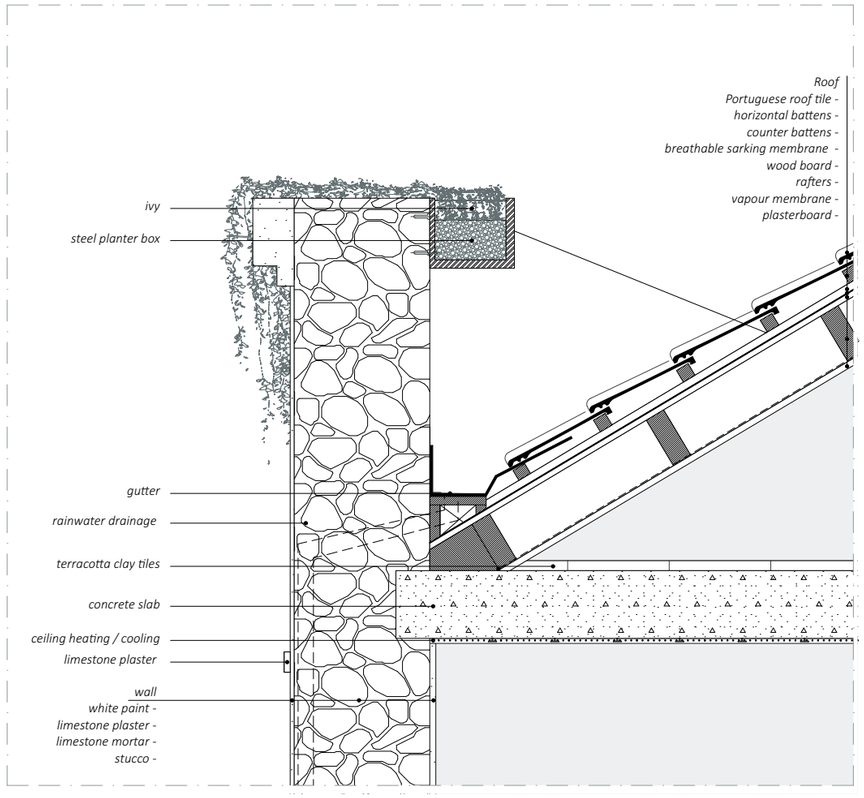


Figure 26. detail of the eaves with the planter and the ivy's

2.4 FACADE

The ivy's do not require a lot of maintenance.They are plants that naturally grow well in the area (Ivy, z.d.). The rain will occasionally water the plants, for dry periods this must be done manually. For this, a rainwater barrel is placed on the roof. This collects the rain and can be used in dry periods to water the plants. This sustainable way ensures that rainwater can be reused and prevents extra use of water. The greenery on the facade can be seen in figure 27.



Figure 27. The greenery on Rua do Bocage 104 and 106

2.4 FACADE

2.4.4 New Facade

Red and Yellows

In this drawing the “red and yellows” it is easily to see what will be demolished and built after the redesign. The drawing of the front facade can be seen, in figure 28. This drawing will be made for every plan, section and elevation and can be found in appendix IV. technical drawings.

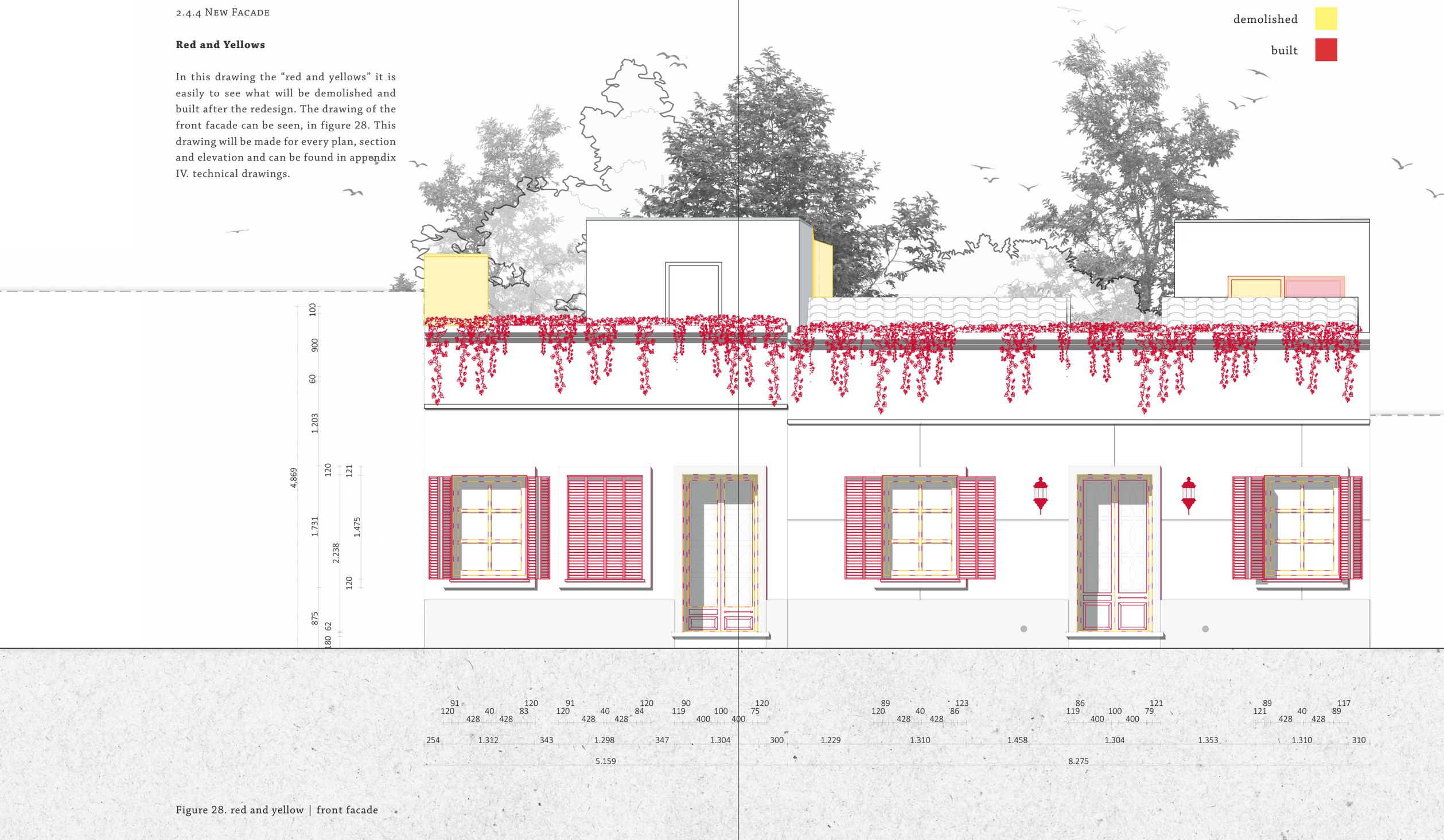


Figure 28. red and yellow | front facade

2.4 FACADE

2.4.4 New Facade

Front Facade

The front facade after the redesign can be seen in figure 29. The redesign was completely based on values from the research. The changes should have a more positive influence on the facade appreciation by locals and tourists. In the next chapter the impact of this redesign will be assessed.



Figure 29. front facade | after the redesign

2.4 FACADE

2.4.4 New Facade

Red and Yellows

In the red and yellow drawing of the rear facade (figure 30) it is remarkeble that a lot of the facade attributes need to be built.

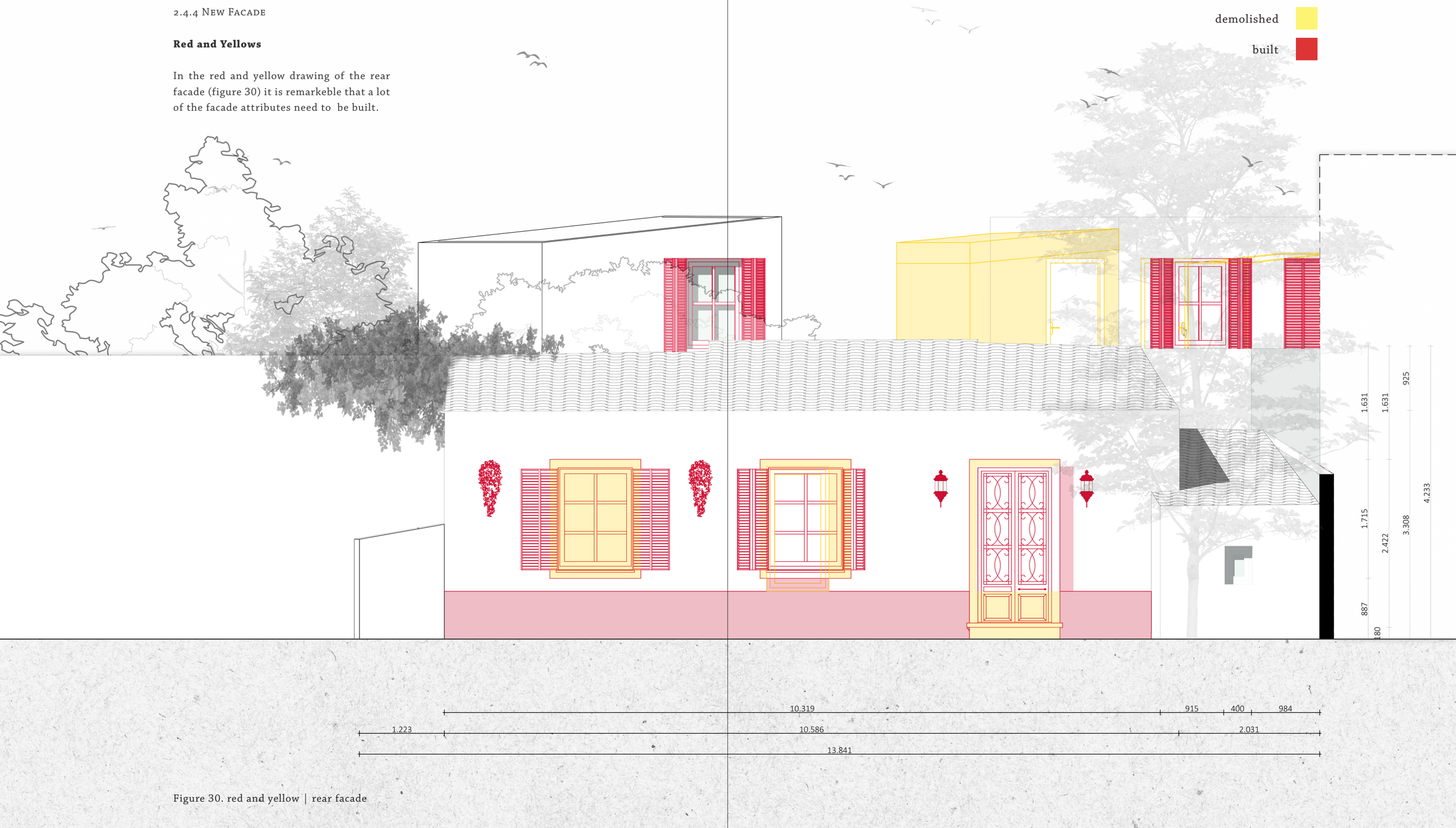


Figure 30. red and yellow | rear facade

2.4 FACADE

The new rear facade can be seen in figure 31. To make the rear facade of Rua do Bocage 106 a matching with front facade the same attributes are used here. Also, the one door two window typology is apllied on the facade.



Figure 31. rear facade | after the redesign





Figure 32. original site plan

SCALE 1 : 2000

2.5 PLAN

2.5.1. Plan Analysis

Original plan of the houses

To understand the existing building and the environment better some analyses have been made.

The houses of Rua do Bocage 104 and 106 are located in a small street with the width of approximately five meters, figure 33. The houses are located in the middle of the street. The back of Rua do Bocage 106 is adjacent to small square with a parking lot.



Figure 33. Original plan of the houses

2.5 PLAN

2.5.1. Plan Analysis

Greenery and old city wall

There is not so much greenery in this area. The only green that is visible in the area is in the square behind the houses. In addition, the restaurant of the building opposite to the houses has an inner garden, but this is a private area that cannot be seen from the street. The green area on the east of the building is now transformed in to appartments and will be gone in the future.

There is also an old city wall that separates the residential area and the square, the grey line in figure 34. This wall stops by the plot.

city wall



Figure 34. Greenery and old city wall

2.5 PLAN

2.5.1. Plan Analysis

Morphological analysis

In the morphological analysis it emerged that the houses are located in a densely built-up street between other buildings.

As a result, the houses can only receive daylight from the front and rear facade, figure 35.

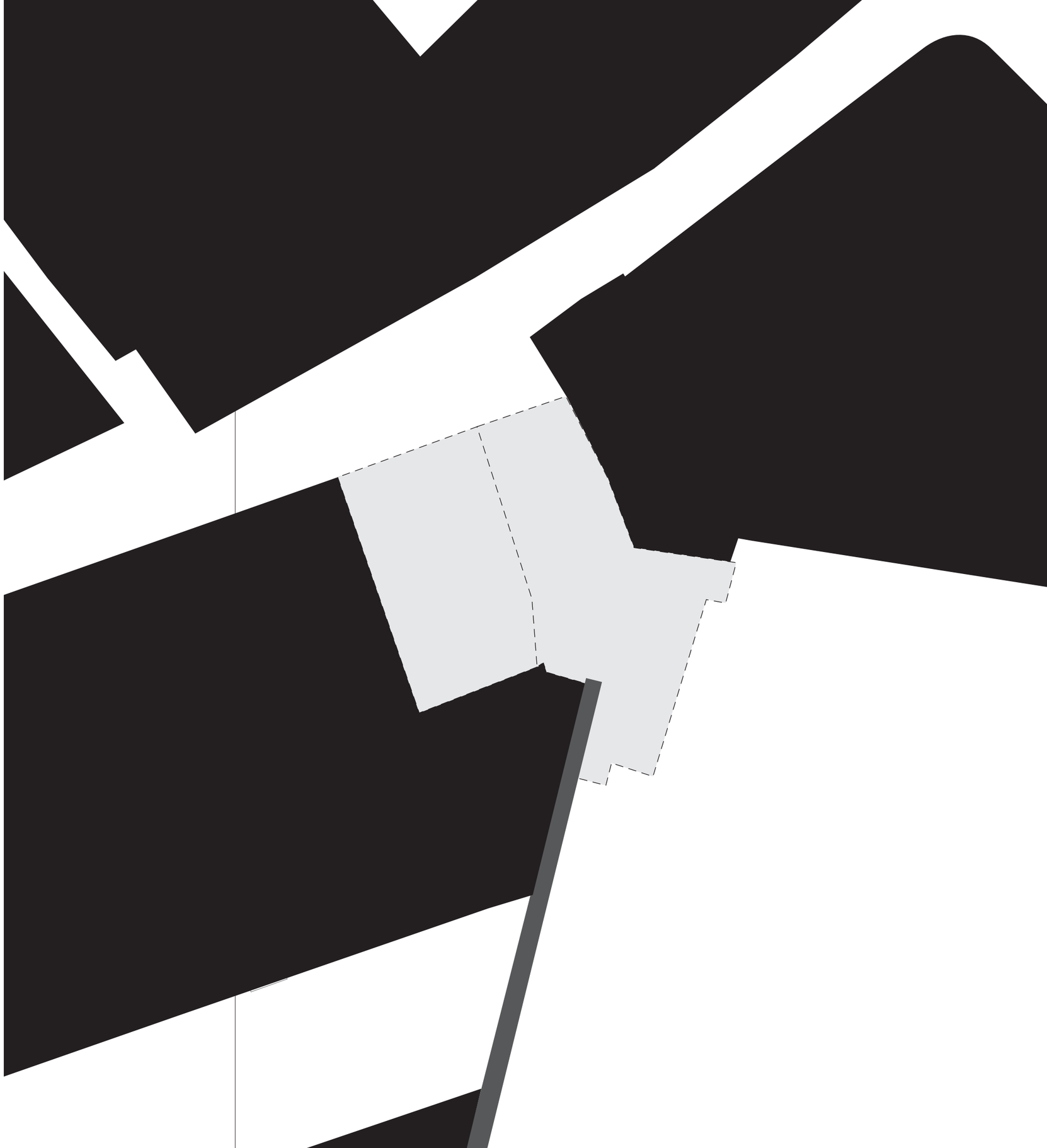


Figure 35. Morphological analysis

2.5 PLAN

2.5.1. Plan Analysis

Structure plan of the houses

By analysing the openings in the walls, it can be concluded that there are actually not that many openings in the front and rear façade, figure 36. Besides that there are not many openings, it is also noticeable that the openings are very small.

This raises the question:

how do all rooms in the house receive a sufficient amount of daylight if there are this few openings in the facade ?

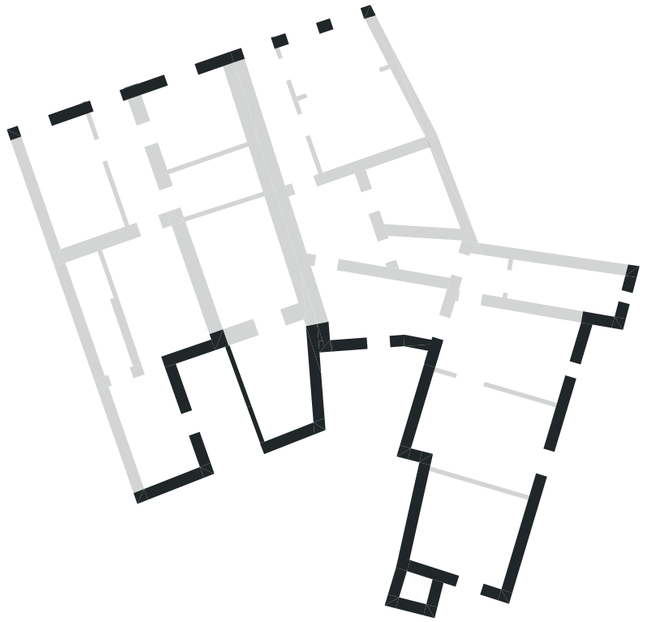


Figure 36. Structure plan of the houses

2.5 PLAN

2.5.1. Plan Analysis

Daylight analysis

This analysis shows which areas have a window, were daylight can enter the room, figure 37. The black areas have no window and because of this also no daylight. The grey areas have a window/ opening and daylight.

It is notable that a lot of rooms in the houses have no daylight at all.

does not have a window and daylight

does have a window and daylight



Figure 37. Daylight analysis

2.5 PLAN

2.5.1. Plan Analysis

Direct sunlight analysis

The sun shines the most on the rear facade, but this area has only a few tiny windows (figure 38). This is probably done to reduce the house from warming up. But this means that there is even less daylight inside the house. Especially, with most of the windows in front of the house on the north facade.

In conclusion, the areas in the front part of the house get much more daylight and not that much direct sunlight. The areas in the back of the house get a lot of direct sunlight, but that is probably why it has very small windows.

Building smaller windows in the facade which is exposed to direct sunlight was probably a building solution in 1920. Because they wanted to keep the house as cool as possible and there were not so many other solutions to prevent direct sunlight from coming into the house then. Also, their was no research or knowledge on environmental influences on health and why daylight is so important.

does not have a window and daylight

does have a window and daylight



Figure 38. Direct sunlight analysis

2.5 PLAN

2.5.1. Plan Analysis

Daylight calculation

After the analysis of the plans, it was clear that a sufficient amount of daylight could be a problem inside the houses. Therefore, for each room in the house daylight calculations are made. To check if it will receive the minimum amount of daylight that is required.

Even though this is the minimum amount of daylight and not enough for a healthy living. Daylight is a very important aspect for the quality of life. The lack of sufficient daylight be directly linked to impaired daytime functioning, sleep problems and chronic diseases such as: diabetes, obesity, depression, cancer and cardiovascular diseases (Rautio,N et al., 2018).

According to de daylight regulations, the rooms have enough daylight if they meet the following 2 rules:

1. Equivalent daylight surface not less than 10% of the area.
2. Minimal daylight of 0.5 m^2.

The calculations (on the next page) show that only one room of both houses meet the minimum daylight requirements. Also, most of the rooms have no daylight at all. Figure 39 shows for each room if they meet the minimum daylight requirements.

not enough daylight

complies with only one rule

enough daylight



Figure 39. Daylight calculation

2.5 PLAN

2.5.1. Plan Analysis

Daylight calculation | Rua do Bocage 104

Total living space 102,2 m²
Sufficient daylight 8,31 m²
12,3 % only meets the daylight requirements

a) Living space 9,94m² surface

A_d =	(1130 - (2x-120)) x (1500 - (2x-120)) = 890 x 1260 = 1,12 m²	
C_b =	α and β is 0%	= 1
	At least 25%:	= 0,86
C_u =	reduction factor	= 1
A_e =	A_d x C_b x C_u 1,12 m² x 0,86 x 1	= 0,963 m²
Area:	A_e < 10%	= 0,994 m² *x*
Living space:	minimal 0,5 m²	= 0,963 m² ✓

b) not a living space

c) Living space 8,31m² surface.

A_d =	(1130 - (2x-120)) x (1500 - (2x-120)) = 890 x 1260 = 1,12 m²	
C_b =	α and β is 0%	= 1
	At least 25%:	= 0,86
C_u =	reduction factor	= 1
A_e =	A_d x C_b x C_u 1,12 m² x 0,86 x 1	= 0,963 m²
Area:	A_e < 10%	= 0,831 m² ✓
Living space:	minimal 0,5 m²	= 0,963 m² ✓

d) Living space 4,77m² surface *no daylight*

e) Living space 4,65m² surface *no daylight*

f) Living space 10,89m² surface *no daylight*

g) Living space 11,28m² surface *no daylight*

h) Living space 7,80m² surface.

A_d =	(800 - (2x-120)) x (1500 - (2x-120)) = 560 x 1260 = 0,71m²	
C_b =	α and β is 0%	= 1
	At least 25%:	= 0,86
C_u =	Reduction factor	= 1
A_e =	A_d x C_b x C_u 0,71 m² x 0,86 x 1	= 0,611 m²
Area:	A_e < 10%	= 0,78 m² *x*
Living space:	minimal 0,5 m²	= 0,611 m² ✓

i) Living space 8,23m² surface *no daylight*



Figure 39. Daylight calculation

2.5 PLAN

2.5.1. Plan Analysis

Daylight calculation | Rua do Bocage 106

Total living space 128,44 m²
Sufficient daylight 16,01 m²
12,5 % only meets the daylight requirements

a) Living space 15,89m² surface.

A_d =	2x ((1130 - (2x-120)) x (1500 - (2x-120))) =	
	2x (890 x 1260) =	
	2x 1,12 m² = 2,24 m²	
C_b =	α and β is 0%	= 1
	At least 25%:	= 0,86
C_u =	reduction factor	= 1
A_e =	A_d x C_b x C_u	
	2,24 m² x 0,86 x 1	= 1,926 m²
Area:	A_e < 10%	= 1,589 m² ✓
Living space:	minimal 0,5 m²	= 1,926 m² ✓

b) not a living space

c) Living space 4,77m² surface *no daylight*

d) Living space 4,65m² surface *no daylight*

e) Living space 4,77m² surface *no daylight*

f) Living space 8,61m² surface.

A_d =	(800 - (2x-120)) x (1500 - (2x-120)) =	
	560 x 1260 =	
	0,71m²	
C_b =	α and β is 0%	= 1
	At least 25%:	= 0,86
C_u =	Reduction factor	= 1
A_e =	A_d x C_b x C_u	
	0,71 m² x 0,86 x 1	= 0,611 m²
Area:	A_e < 10%	= 0,861 m² *x*
Living space:	minimal 0,5 m²	= 0,611 m² ✓

g) Living space 11,89m² surface *no daylight*

h) not a living space

i) not a living space

j) Living space 13,94m² surface.

A_d =	(900 - (2x-120)) x (1800 - (2x-120)) =	
	660 x 1560 =	
	1,03 m²	
C_b =	α and β is 0%	= 1
	At least 25%: = 0,86	
C_u =	Reduction factor	= 1
A_e =	A_d x C_b x C_u	
	1,03 m² x 0,86 x 1	= 0,886 m²
Area:	A_e < 10%	= 1,394 m² *x*
Living space:	minimal 0,5 m²	= 0,886 m² ✓



Figure 39. Daylight calculation

2.5 PLAN

2.5.2 Daylight

In the analysis and calculations made for Rua do Bocage 104 and 106 it can be concluded that there is **no sufficient amount of daylight inside the building**. The lack of daylight has an huge effect on the quality of residents life's.

In the research of Bryan H. Massam (2002) it concludes that a number of researchers McCall(1975), Myers(1987), Davidsonand Cotter (1991), O'Brien and Ayidya (1991), Grayson and Young (1994), Diener and Suh (1997), Turksever and Atalik (2001) have researched the subject of quality of life. They have one general agreement that the quality of life consists of two dimensions:

QOL
quality of life

- Internal conditions: which is psychological
- External conditions: which is the environment they live in

If one of the two conditions is a negative factor, this can lead to a depressed mood (H. Massam, 2002).

For example, adverse house or built environment, including poor housing quality and non-functioning, lack of green spaces, lack of daylight, noise and air pollution are related to a depressive mood (Rautio,N et al., 2018). Depression is a common mental disorder estimated to affect over 300 million people worldwide (World Health Organi-zation, 2017).

It can be concluded that the living environment is a significant predictor of resident's quality of life (Ng, S.L., 2017). The living or built environment is often described in terms of a **"man-made environment"**. Which is an environment where architects have a major influence on (Berg, M. van den et al., 2015).

Daylight is an important factor for the quality of life and human health. It supports human health, activities, productivity and also reduces energy demand. The impact of daylight on human health is significant (Boyce et al., 2003)

In physics daylight is a source of electromagnetic radiation in the visible range, but it does much more than this for the human being. **Physiologically, daylight is an very effective stimulant for the human circadian system and the human visual system**. A circadian system is the biological rhythm whose cycle lasts about one day (also known as 24-hour rhythm). Besides being an effective stimulant, daylight is also a much desired factor in the daily life (Boyce et al., 2003).

The circadian system is important for the health and well-being of the human. A disrupted circadian system will also create long-term health problems. Also, the performance of tasks will be affected by disruption of the human circadian system (Boyce et al., 2003). Exposure to bright light during the day and little or no light at night will accurately effect the circadian system.

Daylighting is an attractive way to deliver bright light during the day. It is not always better than electrical light. However, daylight does have a greater probability of maximizing visual performance than most forms of electric Lighting. That is because, daylight is delivered in large amounts with a spectrum that ensures excellent colour rendering (Boyce et al., 2003).

The research of "Daylight and health: A review of the evidence and consequences for the built environment" summarizes the **positive, negative and neutral effects** of daylight on the human health. Daylight *influences* factors, such as: body height, birth weight, sleep problems, modified changes in human gonadal function and breast cancer tumours. It has a *negative effects* on triggering migraines, epilepsy and autism (Boyce et al., 2003). On the other hand, it has *positive effect* on:

- improvement of vision
- reduction of depression
- reduction of myopia
- reduction of eyestrain
- improvement of relaxation
- reduction of headaches
- stimulation of circadian physiology and cognitive performance
- improving sleep quality
- reduction of ADHD prevalence
- reduction of SAD depressions
- prevention of obesity

The next page (figure 40) illustrates all the diseases that are connected with daylight.

This research also had design guidelines to improve daylight in buildings (Boyce et al., 2003):

- Create daylight openings that can be opened to allow occasional exposure to the full radiation spectrum.
- Design buildings with floor plans that stimulate people to go outdoors.
- Aim for rooms with relatively high daylight levels and provide controllable sunlight and luminance protection with blinds or screens on all daylight openings. The shading/protection gives people the opportunity to control and dose the entering light for the prevention and reduction of migraines, headaches, eyestrain, discomfort or photosensitive epilepsy, but maintains the option to have enough daylight quality and quantity.
- Apply glazing that allows the transmittance of full-spectrum light in order to provide indoor lighting with all parts of the visual spectrum.

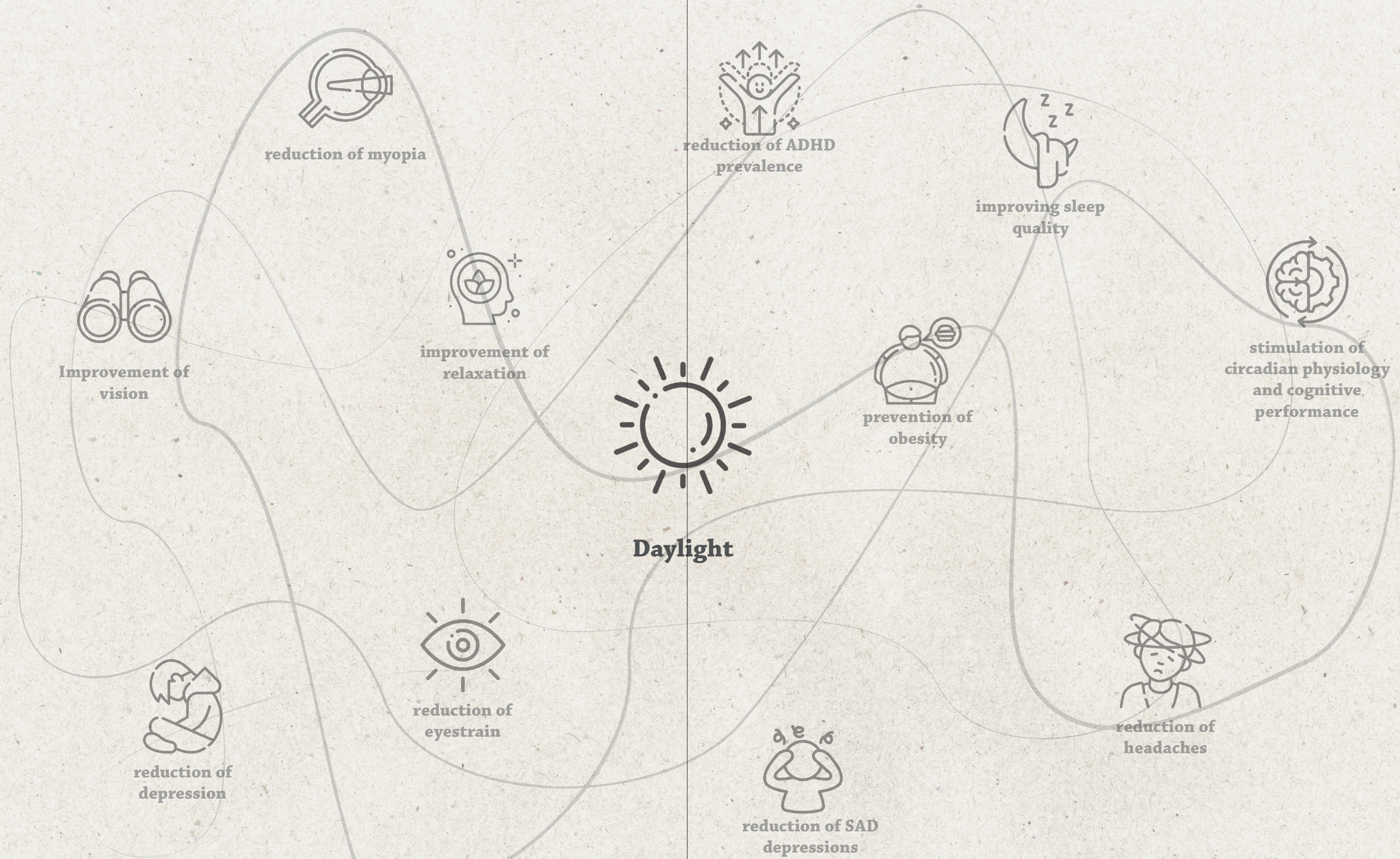


Figure 40. the connection of daylight and health

2.5 PLAN

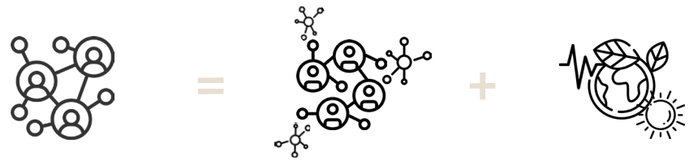
2.5.2 Daylight

Instrumental Value

Based on the research on daylight, it can be concluded that daylight is very important for the health of an human. Daylight is an environmental factor that significantly influences the quality of life.

Therefore, this needs to be taken into account during the design process. This is were actually another value comes in to place, **the instrumental value**.

After the values from the community, the analysis showed that the house missed needs for an healthy living. Indeed, this came also forward in the research where it scored very low on health. In research by Arias-Arévalo et al. the instrumental value, is a value which can be used to as a mean to an end (2017). In this case it is to receive more daylight in to the building to avoid health problems and improve the quality of life.



Design Based on Values

"In the sphere of cultural heritage, the preservation values are critical deciding what to preserve and how"

Values of Community

Different groups and individuals attach different weight to the values, and different levels of relevance to the same cultural heritage asset.

The range of values ascribed to a cultural heritage asset and justifying its designated status.

Instrumental values

Instrumental value: the value of an entity as merely a means to an end.

Respondents' references to economic development and monetary benefits are coded as instrumental values.

2.5 PLAN

2.5.3. Plan Redesign

Daylight calculation

After the calculations where made this is the final result of the daylight analysis. By Rua do Bocage 104 only 12,3 % meets the minimum amount of daylight requirements. By Rua do Bocage 106 only 12,5 % meets the minimum amount of daylight requirements, figure 41. This can be seen as an huge problem that will have an negative effect on the human body and the quality of life.



Figure 41. daylight calculation

2.5 PLAN

2.5.3. Plan Redesign

Problem area

To find a solution the problematic area is marked in yellow, see figure 42. It is mainly located in the middle of the houses. This area has no sufficient daylight in the rooms.

problem area



Figure 42. problem area

2.5 PLAN

2.5.3. Plan Redesign

Design solution

Adding roof light to the building can help with daylight, but will not be as effective as openings in the wall. Also, the roof light will ensure that the rooms heat up faster because a lot of sunlight falls on the roof and works against the thermal mass.

By removing storage area, there can be received much more daylight Inside, figure 43. This open area can also be used to add some of the greenery which is highly valued in the research. This way they have more daylight living in the house which will have positive effect on the quality of life. But they will also have a view over greenery, which they very value and is also a improvement to the quality of life. Also this shared patio will give them a green area where they can socialize and enjoy the greenery together.

does not have a window and daylight

does have a window and daylight



Figure 43. design solution

2.5.3. Plan Redesign

Structure

The storage area is an addition to the building, by removing this it will not affect the main structure a lot. This can be seen in figure 44, where the load-bearing walls are shown.

load-bearing walls

normal wall

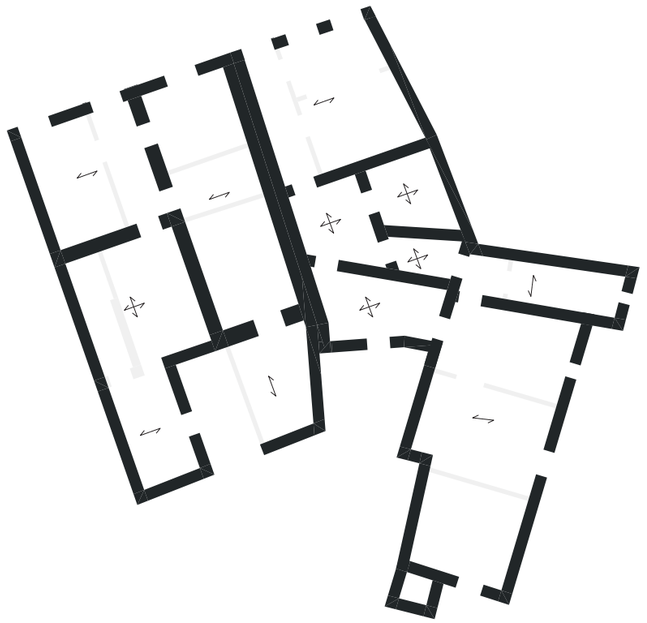


Figure 44. Structure

2.5 PLAN

2.5.4 Patio

Opening up the area were the storage is located now will create an open area between the houses. Before there were two smaller open areas, see figure 45. The open space can be combined into one shared patio for the houses. The patio can be used to receive more daylight in the house and it can be used to extend the living area outdoors. The residents can benefit from more daylight instead of dark rooms in the house, but also have a place outside.

QOL
The effect of greenery on the quality of life

Greenery and Qualit of Life

The patio can be made more valuable and appreciated by adding greenery in to it.

This has two main reasons:
First of all, greenery was an very positively valued attribute in the research from chapter 01. All the different elements of greenery, such as: green bushes, flowers, flower pots and hanging ivy's, were seen as beautiful, authentic, and healthy. Although, this research was on attributes on the facade it can be assumed that greenery also could be appreciated in the patio. This attribute was also very encouraged in the design guidelines.

Second, the patio will also add more to the quality of life if it is combined with greenery. According to the study of Magdalena van den Berg on "Health benefits of green spaces in the living environment", the researcher concludes that living in greener environments is associated with better mental health and lower all-cause mortality. Adding greenery to the living environment is a promising tool to enhance the residents quality of life. It is important that in green environments the focus should shift from quantity to quality of green spaces (Berg, M. van den et al., 2015).

Greenery and a outside living environment statistically significantly influence to reduce a depressive mood (Rautio,N et al., 2018).

Another study also elaborates on that the visibility and accessibility of green elements and spaces are also important for the well- being and health (D'Alessandro et al., 2022). By making this patio greener and in the centre of the four houses it will be more visible and also accessible for al the residents. Also by making the living area adjacent to the patio, it ensures that they always have a visual connection with this greenery.

Cities are made up of buildings, "grey spaces" and "green spaces". "Grey spaces" are open space between buildings, such as hard infrastructure. "Green spaces" are open spaces with natural elements such as parks, playgrounds and recreation areas. The availability of green spaces provides opportunity for physical activities outdoor, relaxation and social contacts which will benefit the mental health of the human being (Berg, M. van den et al., 2015). This patio will be a shared patio of the houses and will be also a source for physical activities outdoor, relaxation and social contacts with the neighbours.

To summarize, the patio is a solution to receive more daylight in to the houses, but because of this the residents also have an physical area outside, a communal place to socialize and by adding greenery it will benefit their health and quality of life. Besides the benefits, a patio is also an already used element in Portuguese houses, like a backyard. It doesn't always have greenery but most houses have an open area in their houses. Patio's are also common used in the neighbourhood of Sao Francisco and Faro, see figure 46 and 47.



Figure 45. original plan ground floor of Rua do Bocage 104 and 106



46. original site plan with other patio's in Faro

SCALE 1 : 2000



Figure 47. new site plan with the patio of Rua do Bocage 104 an 106

SCALE 1 : 2000

2.5.4 Patio

Moodboard

The redesign will be made with the natural elements that are available in the area. For instance, reed is a well known material used a lot in Faro for different kinds of purposes. Besides reed wood is also a natural material that will be used for furniture.

A monochromatic colour palette will be used consisting of whites, beiges and greys coming from the natural colour of the materials. This is because of the aesthetical perspective, but also to reduce the urban heat isle in the area. Because the patio is on the south facade it will probably heat up quickly. Therefore, light colours and especially white is used a lot. Other elements that will reduce the urban heat isle is greenery. The tree in the backyard and the greenery that will be added will help with prevent the urban heat.

The tree also provides some shading in the patio and blocks direct sunlight from coming into the houses. For the parts that do not have any shading, a thatched overhang will be built. This can be seen in figure 48.

The only colour comes from the greenery of the plants and Portuguese tiles that will be used to enhance the Portuguese character. From the research in chapter 01, the patterned tiles were really appreciated by both locals and tourists and this will be used in the redesign of the patio.

The references of the moodboard can be found in appendix VI.



Figure 48. Moodboard for the patio

2.5.4 Patio

Greenery

There is already an existing tree in the patio. More greenery will be added in the patio, because it is very positively valued by the locals and benefits their health and quality of life, figure 49.

There are several types of plants that can be planted in the patio. The greenery that will be planted will come from plants that grow in the natural environment of Faro. There is a website that shows which different types of trees, plants and flowers that grow in Faro, Portugal (Faro, n.d.). These different plants have been studied and a selection of greenery has been made that are suitable for the patio.

The greenery will be planted in planters against the wall of the patio, see figure 50. This creates a green line along the entire patio and there is always a visual connection from the living rooms to the greenery. Because the patio is very narrow, a bench is made against the planters to make double use of this space (figure 1). The planters are approximately 10 meters long and 30 cm wide, which means that approximately 3 square meters of greenery can be planted.

Figure 50. Planters against the wall

https://i.pinimg.com/originals/eb/ed/f1/ebedf1292c71c7c650da9d5728e5aa9b.jpg



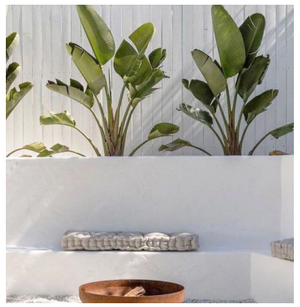


Figure 51. Benches

https://www.cotemaison.fr/jardin/comment-proteger-son-jardin-de-la-chaleur_33595.html

There are two types of greenery that can be planted in the patio. One is more for greenery and aesthetic values, such as: plants and flowers. The other one, is to also be able to benefit from, such as: vegetables, fruits and herbs. After researching the possibilities, the following greenery will be planted (Faro, n.d.).

Figure 49. the patio

2.5.4 Patio

Vegetables, Fruits and herbs

Lemon tree

A lemon tree (figure 52) is being planned in planter in the patio of the houses. The special thing about a citrus fruit is that it is a summer and winter fruit and the fruit grow almost all year round, they do not have a seasonal stop. Also the blossoms bloom all year round. These lemon blossoms also have a very nice scent and will be a natural source of fragrance in the patio (Lemon, n.d.).



Figure 52. Lemon tree

https://www.picturethisai.com/wiki/Citrus_limon.html

Herbs

For the planted herbs, research was first carried out into the most commonly used Portuguese herbs (Koopmans, 2022), these were: parsley, thyme, mint, rosemary and coriander. All of these can grow in the patio in a Portuguese environment, figure 53-56. Mint is hard to maintain and not suitable for long planters, it will grow to quickly and can not be easily controlled. The other plants can be planted in the patio: parsley, thyme, rosemary and coriander.



Figure 53. parsley

https://nurserylive.com/products/parsley-plant



Figure 54. thyme

https://www.gardeningknowhow.com/edible/herbs/thyme/pruning-thyme-plants.htm



Figure 55. rosemary

https://hotcore.info/babki/rosemary-plant-in-pot.htm



Figure 56. coriander

https://www.pngegg.com/en/png-cfvzg/download

2.5.4 Patio

Vegetables, Fruits and herbs

Flowers

The yellow flowers that have been chosen match the lemon tree and grow naturally in the region. This way the monochrome colour palette will not be disturbed that much. Green and yellow are two natural colours that go well together and with the mood board. Also these plants are very special that grow in Faro. Flowers that are planted are: cretan bird's foot trefoil and villious deadly, figure 57 and 58.

Figure 57. Cretan bird's foot trefoil

https://www.dreamstime.com/stock-photography-cretan-birds-foot-trefoil-full-spring-



Figure 58. Villious deadly

https://www.alamy.com/stock-photo/villous-deadly-carrot.html?sortBy=relevant

That grow really well in the area are: foxtail agave and century plant. The century plant is a special plant that naturally grows in salty soils (figure 59). Foxtail agave are small plants perfect for the planters (figure 60).

Figure 59. Century plant

https://www.starnursery.com/product/century-plant



Figure 60. Foxtail agave

https://www.picturethisai.com/wiki/Agave_attenuata.html



Figure 61. Plan of the ground floor with section B - B

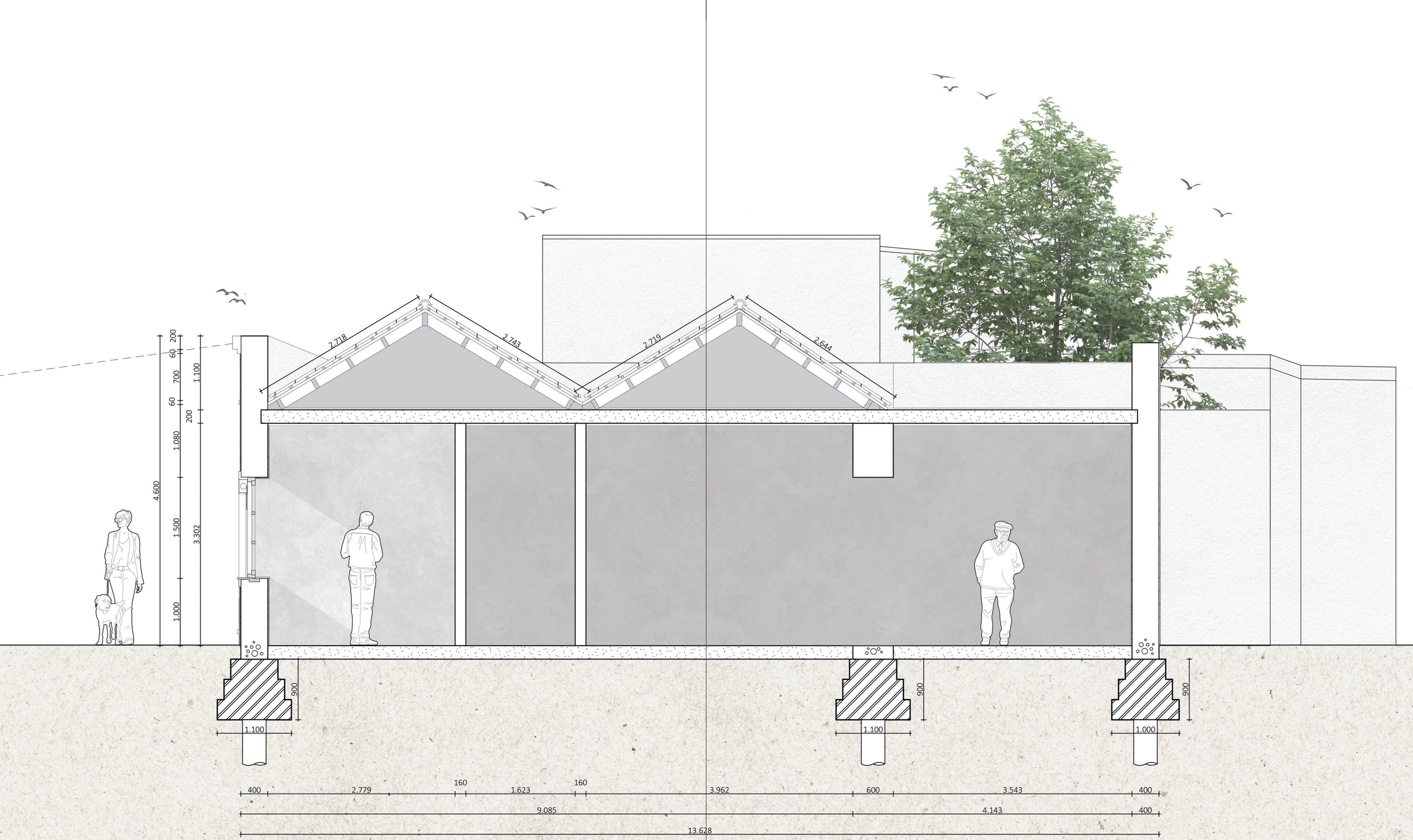


Figure 62. section B-B | before the redesign

SCALE 1 : 50

demolished

built



Figure 63. section B-B | red and yellows | with with the demolishment for the patio's

SCALE 1 : 50



Figure 64. section B-B | after the redesign

SCALE 1 : 50

“ **a** Luz **na Casa** ”

“ **The** Light **in the House** ”

2.5 PLAN

2.5.5 Affordability

Many locals moved out of the old town and the neighbourhood of São Francisco. Due to two reasons. First, because of the very high prices of the housing market. Secondly, because there are currently only a few houses available on the market.

This is an increasing problem and needs a solution. This was discussed during a conversation Patricia Malobbia from the municipality of Faro. Therefore, this is seen as **the second goal** for the redesign.

In figures 65 - 68 the different options to split the houses in to apartments can be seen. After seeing all the different designs, option D (figure 68) is the most suitable for the redesign. This way the houses all have a front facade and entrance, all houses are connected to the patio and there are the most number of houses.

Also in this option the square meters of each house is similar to each other. One house is that much not bigger than the other house. These small houses can be designed with the concept of tiny housing vision of “less is more”.

- house 01
- house 02
- house 03
- house 04



Figure 65. Splitting houses - option A



Figure 66. Splitting houses - option B

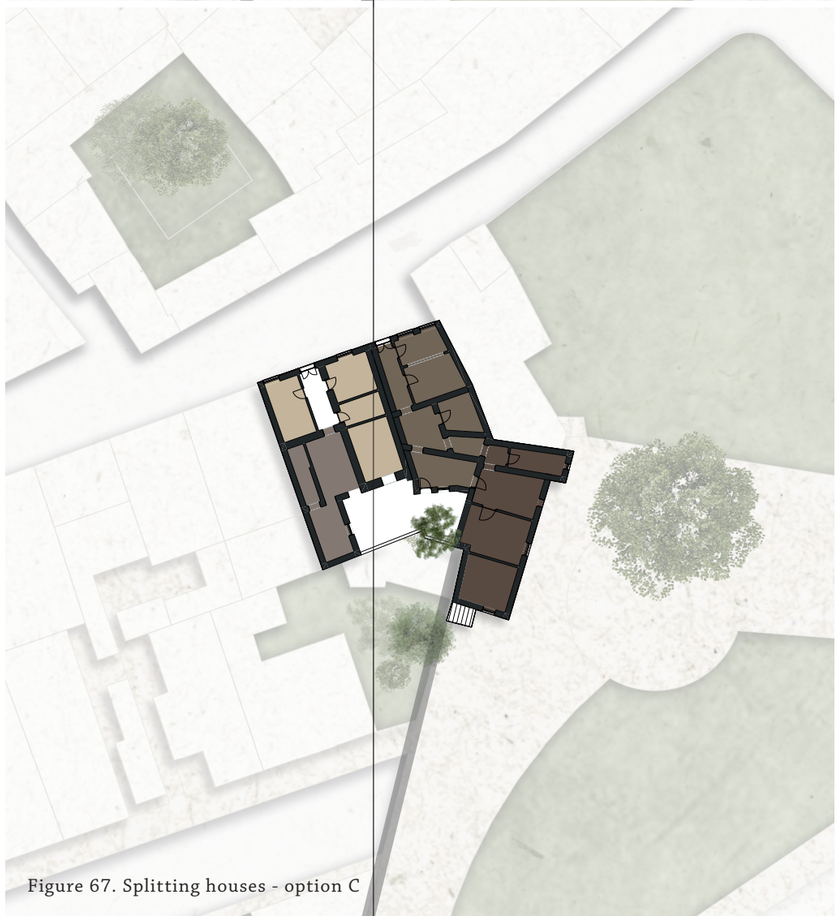


Figure 67. Splitting houses - option C



Figure 68. Splitting houses - option D

2.5 PLAN

2.5.6 Cross ventilation

There is one more reason why this redesign option D is the most suitable. That is because this option is optimal for **cross ventilation**. Cross ventilation is a natural ventilation, where fresh air, wind or a breeze enters the house through an opening, such as a door or window, and flows through the space and exits through another opening on the opposite side of the building.

Ventilation
passive cooling

This is possible due to high and low air pressure (Cross ventilation, n.d.). Cross ventilation naturally ventilates the room. This works best if the windows or opening are positioned on opposite sides of the room. This will provide a passive cooling during the warmer periods in Faro and is also a very energy efficient method. Cross ventilation also improves indoor air quality (Cross ventilation, n.d.).

Rua do Bocage 104 and 106 are very suitable for cross ventilation for the following reasons:

- The houses have a length of less than 12 meters

- The houses have are narrow (maximum 5 meters)

- The house (hallways, windows and doors) are positioned perpendicular to the wind. Wind mainly comes from the south, and can sometimes turn slightly from the south-east or south-west. This can be ssen in figure 67.

- There is no noise pollution, because there is no busy road nearby.

- The houses are provided with a regular distribution of opening, especially the patio allows a lot of air to enter the house, see figure 69.



Figure 69. Cross ventilation

2.5 PLAN

2.5.7 Redesign of the plan

Design option A - ground floor

In figure 70 and 71 is the plan for design option A. In this option the plans are almost not changed at al. The intervention is minimal.

This is an option that shows how the redesign could be if the storage is not removed. The functions are described in the rooms. This design is actually not possible, because a lot of the rooms do not have daylight. And for livingsspaces daylight is needed. In this design option, almost half of the living areas have no daylight.

Also, some areas are very small.



Figure 70. Design option A - ground floor

2.5 PLAN

2.5.7 Redesign of the plan

Design option A - first floor

On the first floor there are two bedrooms and a storage.
The rest of the roof can be used as a roof terrace.



Figure 71. Design option A - first floor

2.5 PLAN

2.5.7 Redesign of the plan

Design option B - ground floor

In figure 72 and 73 the second design option can be seen.

In this option, the storage room is removed and a large open space is created as a patio. Large glass doors will be installed in the adjacent facade and the spaces will receive daylight through this patio, see figure 74.

A disadvantage is that Rua do Bocage 106 still has unfavourable rooms because they do not have sufficient daylight and no living space can be created here.



Figure 72. Design option B - ground floor

2.5 PLAN

2.5.7 Redesign of the plan

Design option B - ground floor

A solution is to place a skylight above these rooms so that a living space, like a bedroom can be made here, figure 73.

But in conversation with the climate consultant this was not recommended, because it works against the thermal mass. The room will also heat up very quickly and it will not be possible to ventilate through a window.

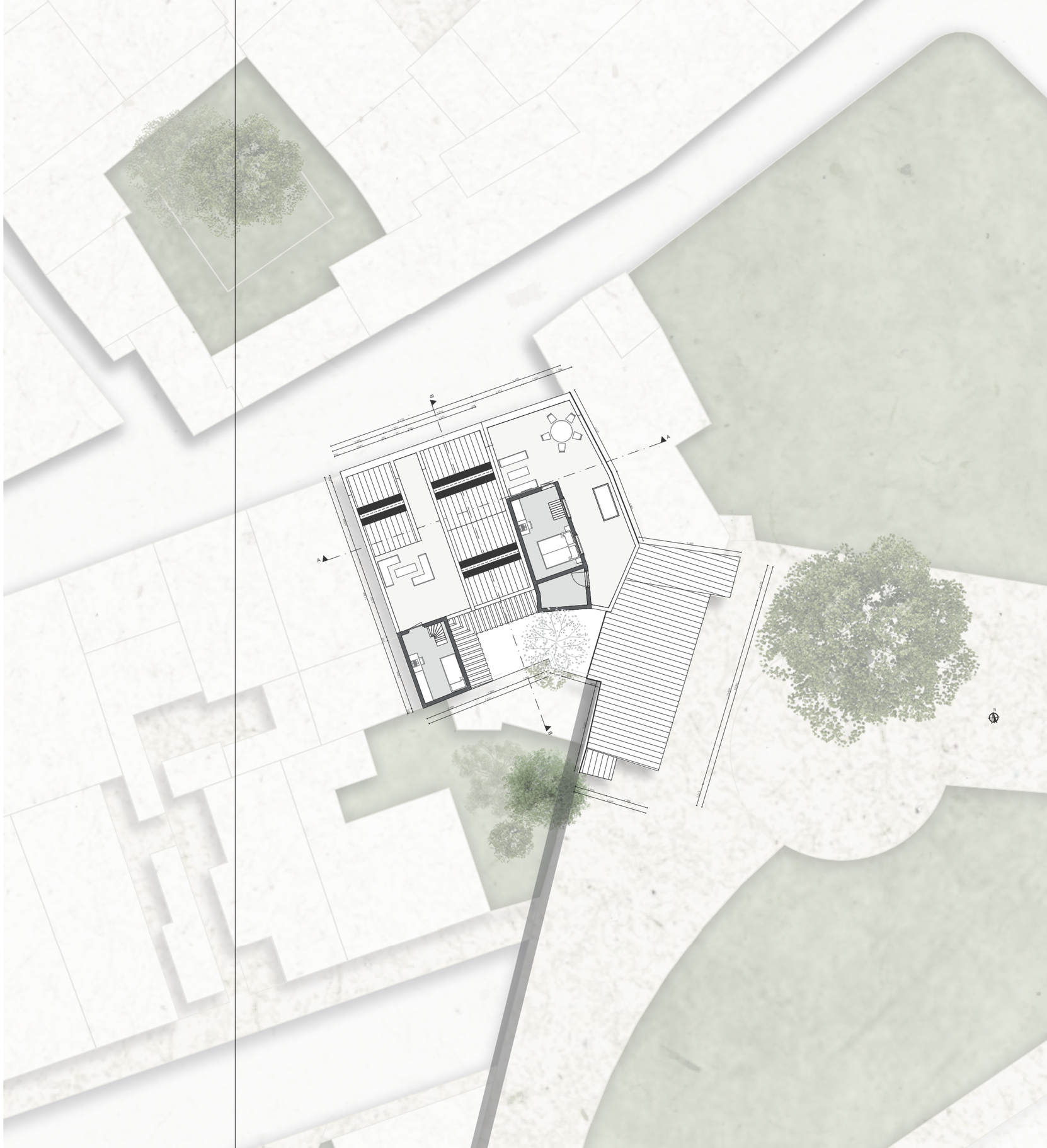


Figure 73. Design option B - first floor



Figure 74. More daylight in the living room through patio

2.5 PLAN

2.5.7 Redesign of the plan

Design option C - ground floor

In this design option, a solution has been made for the unusable rooms without daylight, figure 75.

In this case, the inner walls of the room have been removed to make it a larger room, figures 76 and 77. This way it receives enough daylight through the patio, figure 78. This larger space has the kitchen, living room and the stairs to the first floor.

The existing walls are replaced by a steel portal. But in order not to get rid of the traces of the old design, they are removed not to the ceiling, but to a height of 2.4 meters. The total height is approximately 3 meter. As a result, the residents will always feel how small the rooms were before and they will not lose the connection with the past design.

Another advantage of this design option is that all living rooms are adjacent to the patio and therefore always have a visual connection with the greenery.

Also important is that this design solution provides more privacy. The patio is shared among the four neighbours. For more privacy, the bedrooms are placed in the front of the house.



Figure 75. Design option C - ground floor

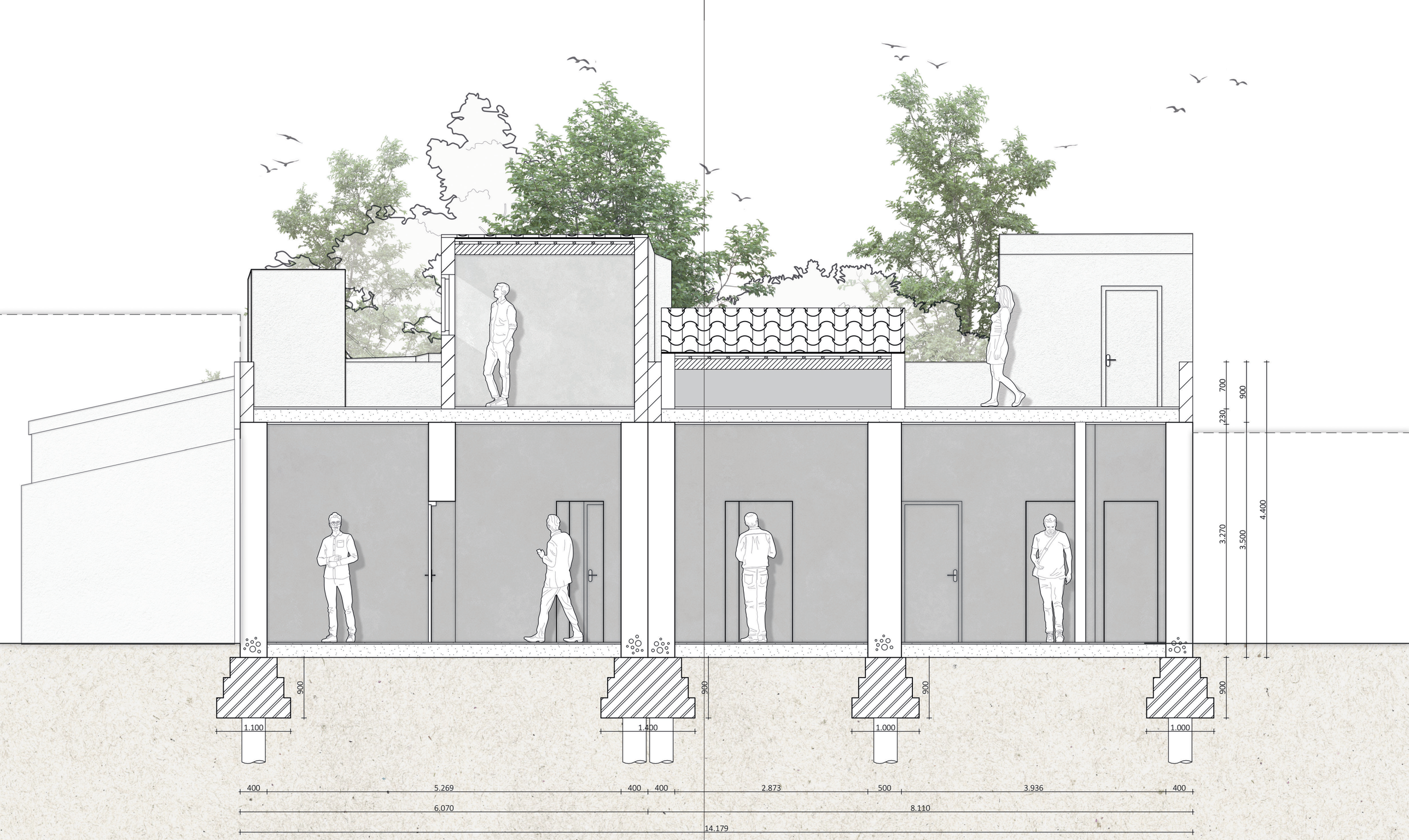


Figure 76. section C - C | before the redesign

SCALE 1 : 50



Figure 77. section C - C | red and yellows | bringing more light into the rooms

SCALE 1 : 50

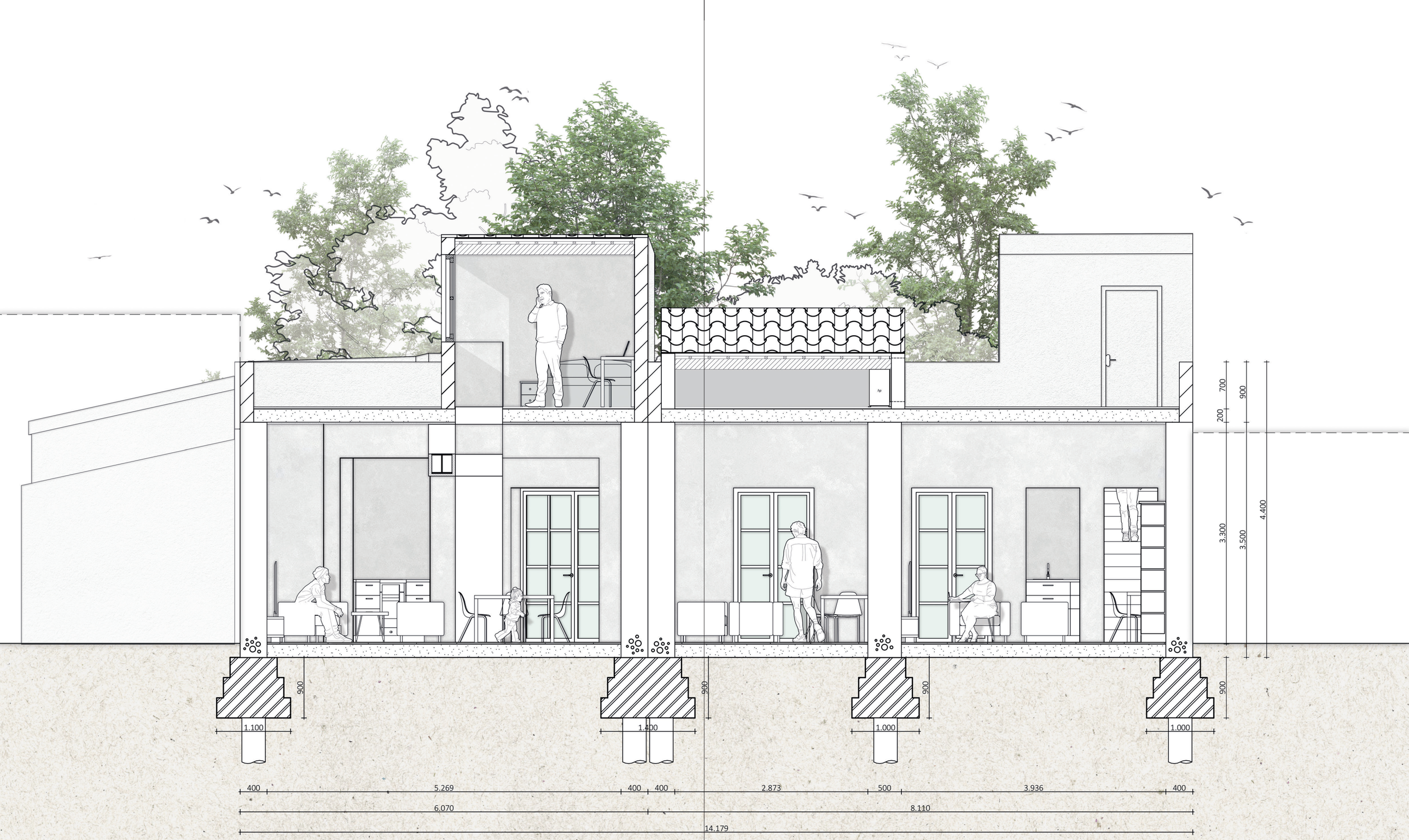


Figure 78. section C - C | after the redesign

SCALE 1 : 50

2.5 PLAN

2.5.7 Redesign of the plan

Design option D - ground floor

In the redesign of the patio it became apparent that the corner is very unfavourable for designing this space. It is already a narrow area, but this makes is even smaller.

By straightening this, more can be done in the patio and it also looks more like a whole place, see figure 78 on the next page.

This corner also causes shadow to fall on the facade of the house next door. The space behind this wall is a large kitchen with living room and can do without these few centimetres, figure 79.



Figure 79. Design option D - ground floor



Figure 78. the patio

2.5 PLAN

2.5.7 Redesign of the plan

Design option D - first floor

The entire facade is moved about half a meter. This intervention also removes the extra storage space on the first floor, see figure 80. But the space of the patio is much more favourable.

In figure 81 a fragment of the patio on scale 1:20 can be seen.

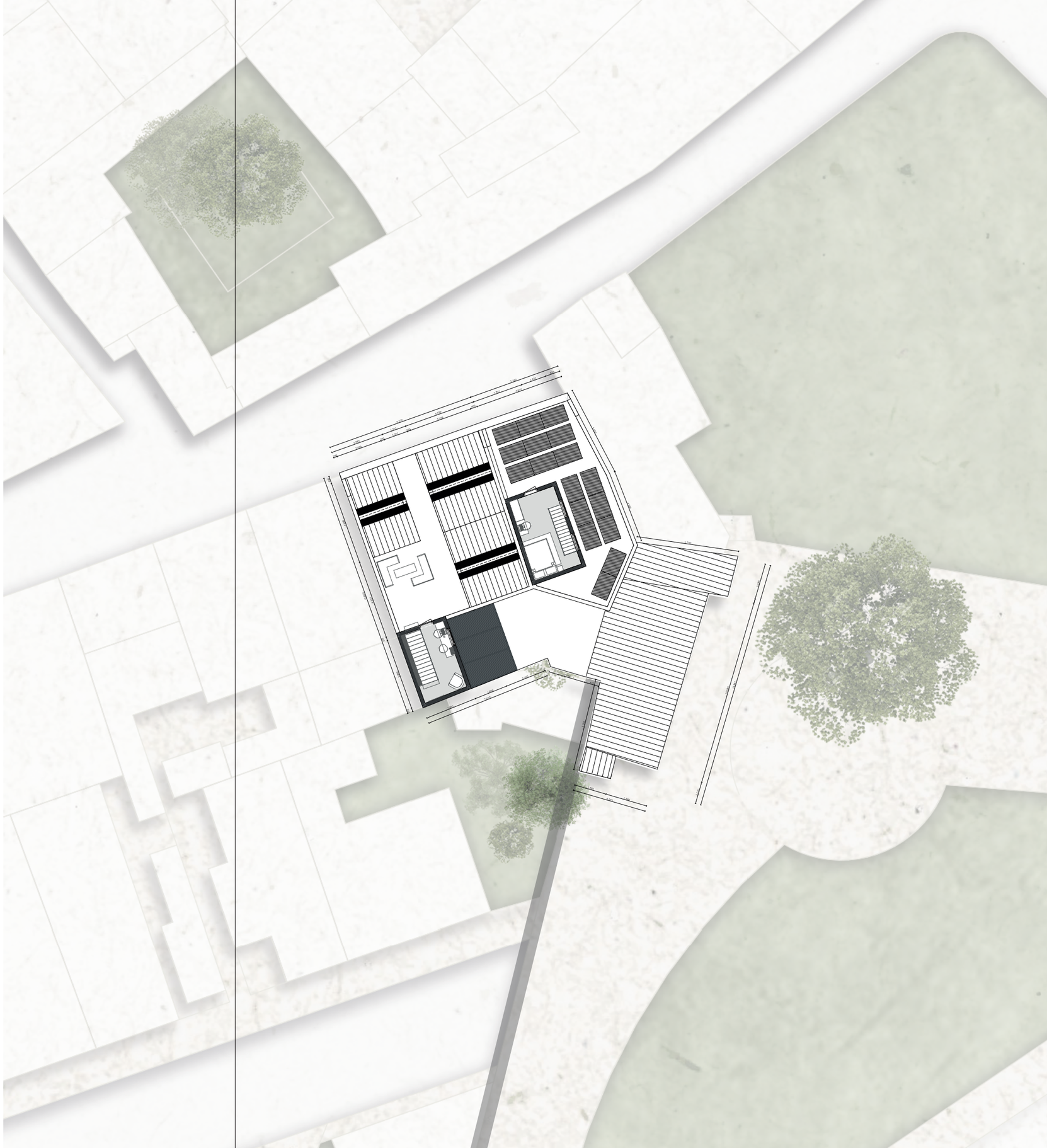
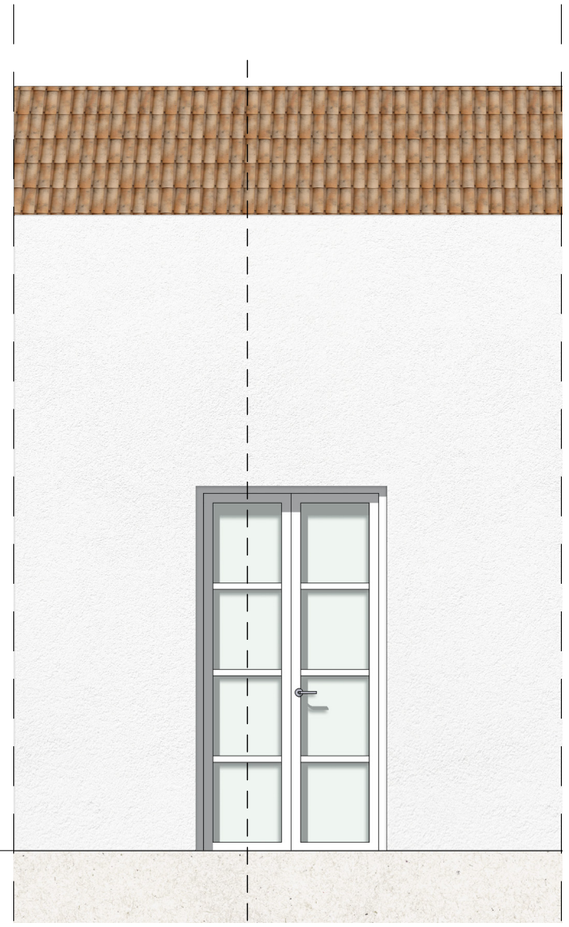


Figure 80. Design option D - first floor





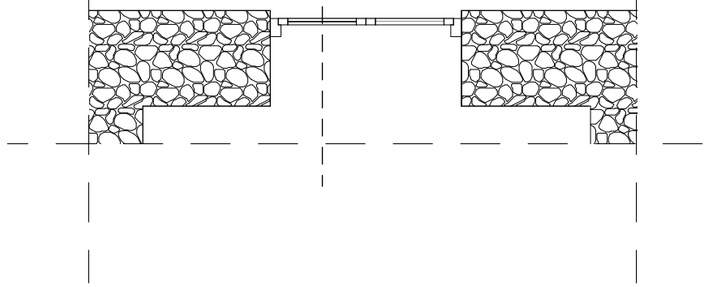


Figure 81. fragment 01

SCALE 1 : 40

2.5.7.1 Interior Mood board

The interior of the houses is designed in a minimalistic way. Minimalism is a design aesthetic that embodies the phrase “less is more.” The small houses go back to minimalist life, or can be compared, for example, to tiny houses (Tarkett, n.d.). The minimalistic interior design fits the redesign Concept. The moodboard can be seen in figure 82.

By a minimalist design the idea is to stripping down to essential elements in the house and using clean, modern, and minimal aesthetic, details and colour choices. A minimal design has the following points of attention:

- Essentials
- Cleanliness
- Monochromatic colour palette
- Combine different shades and textures

On the next page (figure 83) is an interior visualisation of the living room inspired on this moodboard.

The references of the moodboard can be found in appendix VI.



Figure 82. Moodboard for interior



Figure 83. More daylight in the living room through patio



Figure 84. original plan | ground floor of Rua do Bocage 104 and 106

SCALE 1 : 100

demolished

built



Figure 85. red and yellow | ground floor of Rua do Bocage 104 and 106

SCALE 1 : 100



Figure 86. after the redesign | ground floor of Rua do Bocage 104 and 106

SCALE 1 : 100



Figure 87. original plan | first floor of Rua do Bocage 104 and 106

SCALE 1 : 100

demolished

built

Figure 88. red and yellow | first floor of Rua do Bocage 104 and 106

SCALE 1 : 100



Figure 89. after the redesign | first floor of Rua do Bocage 104 and 106

SCALE 1 : 100

2.5 PLAN

2.5.8 Climate

To make the house more sustainable and future proof a few interventions are made for the house.

Energy

Reducing energy use

It is important to understand what requires a lot of energy and how it can be reduced. Electricity requires a lot of energy in the house. In the old design, many rooms had no or insufficient daylight, which means that a lamp must constantly illuminate the room. In the new design, almost all rooms have **daylight** and don't need to be lighten up. This ensures that less energy is used for lightning in the house.

daylight
less energy use

Rua do Bocage 104 and 106 are located in a warm country, in the south of Portugal. This means that the house has to be cooled mainly throughout the year. The houses are therefore split in such a way that optimal use can be made of **cross ventilation**. This allows passive cooling and saves electricity. Also the doors in the patio can be tilt in the night for night cooling. This is a strategy that uses the cooler temperature of the night for the building's ventilation and cooling for the next day. In the paragraph cross ventilation, on page 170 this passive cooling system is further explained.

cooling
passive cooling

Urban heat isles occur when cities are full of pavement, buildings, and other surfaces that absorb and retain heat. This effect increases energy costs (for cooling), the air pollution levels and mortality. To **reduce the urban heat isle a** lot of greenery (plants and vegetation) is added to the redesign of the building. Also using a lot of white and lighter colours on the building helps reducing the urban heat isle (epa.gov, n.d.).

urban heat isle
prevent urban heat isle

Rainwater water is collected in **rain barrels** on the roof. This water can then be reused for watering the plants and vegetation on the roof and in the patio.

rain barrels
reuse of water

Reducing the energy use can be seen in the diagram, figure 90.



Figure 90. section A-A, reducing energy use

2.5 PLAN

2.5.8 Climate

Energy

Renewable energy

After reducing the energy it is important to have a source for sustainably energy. This will be done by **solar panels** on the roof. The total area of the roof is quite big and according to the energy use calculation, 33 panels are required to provide enough energy to be energy neutral. For example, by using the excellent power panel from Vattenval is used (Vattenfall, n.d.). This will fit on the roof of the first floor and on the roofs of the two rooms on the second floor.

A disadvantage of so many solar panels is that there is no room left for a roof terrace and it obscures the architectural view of the rooms on the first floor. Also the solar panels will not be placed on the Portuguese roof tiles, because it will cover an important part of Faro's identity and heritage.

Energy
58% energy
is sustainable

To keep a part of the roof terrace 19 solar panels are placed on the roof of the house and provide 58% of the energy requirement. The solar panels can be seen in the diagram, figure 91.

Solar panel calculation

Apartment	A	B	C	D
	2 people	2 people	3 people	2 people
	2700 kWh	2700 kWh	3500 kWh	2700 kWh
	Total energy use		= 11.600kWh	
			= 13.647 Wp	
	Vattenval: excellent power panel		= 405 Wp	
	13.647 / 405 Wp		= 32,69 panels	

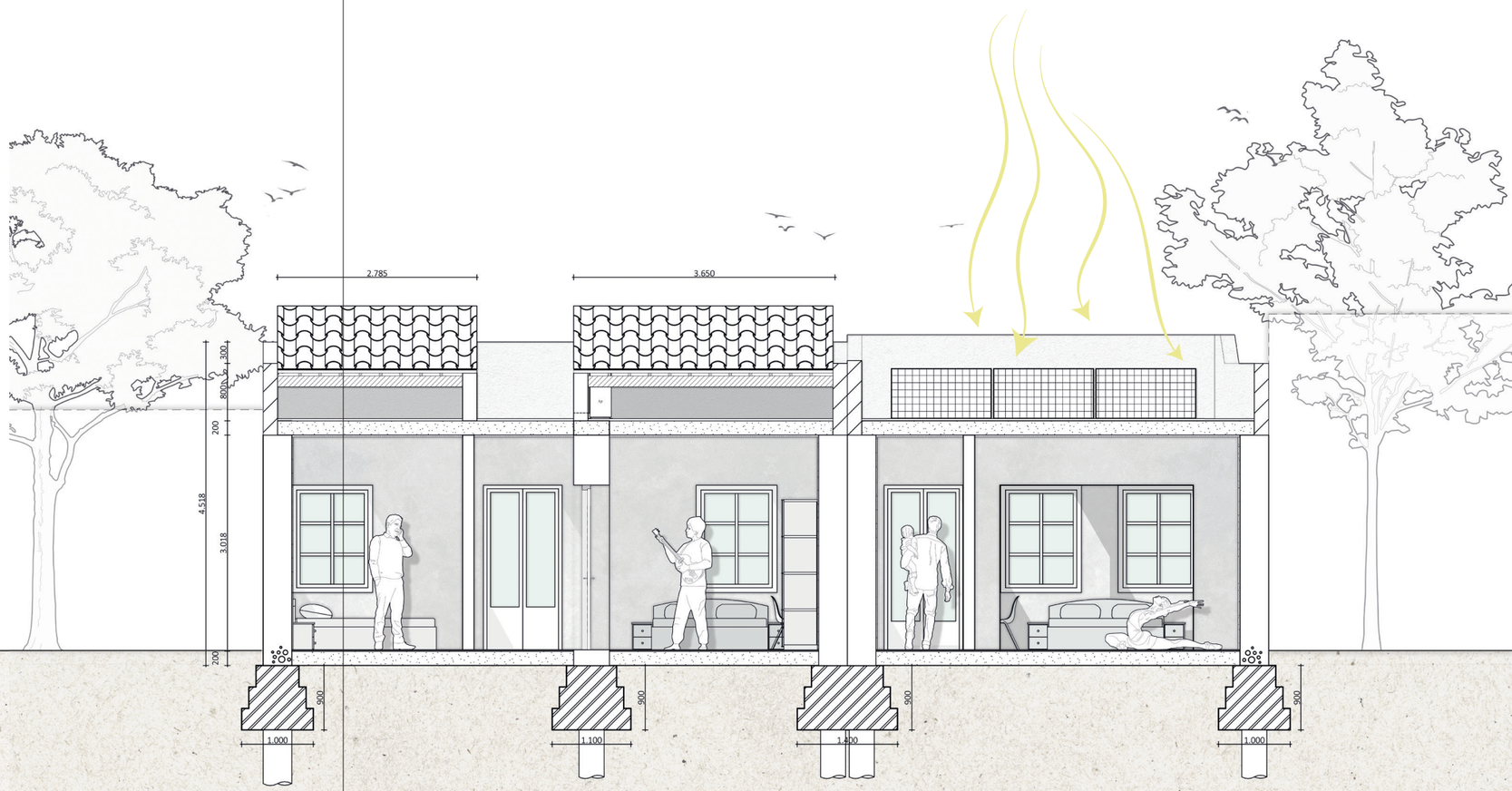


Figure 91. section A-A, solar panels

2.5.8 Climate

Air water heat pump

The solar panels are connected to the **air water heat pump**. There are 3 air water-pumps needed for the houses these are placed on the roof of Rua do Bocage 104 and 106, they can get air through a opening on the side.

This heat pump will work on the electricity from the solar panels and heat or cool the (tap) water that is used for the house on in a sustainable way. This heat pump will also be the source for the cooling and heating ceiling in the house.

The heat pump that is going to be used is the **Daikin Altherma R - Hybride heatpump**. This heatpump has an unit outside (hxbxl 735x300x830) and an indoor unit (hxbxl 890x 450x400). The indoor unit is connected to the existing boiler and uses electricity instead of gas to heat up the (tap) water, figure 92. This electricity comes from the solar panels on the roof (Daikin, 2020).



Figure 92. section A-A, air water heat pump

2.5.8 Climate

Cooling and heating

Cooling
cooling the building will be the main priority

The **heating and cooling ceilings** are a mechanism that can provide heating and cooling with one single system. Because the project is located in a warmer climate, the first focus will be on cooling the air. These ceilings provide a pleasant indoor climate. For instance, in the summer the ceiling cooling radiates a uniform temperature without cold air circulation or noise, figure 93. This system has also a low energy consumption. Also the cool air naturally goes down and has more effect on cooling (Radiant Cooling Ceilings, n.d.).

In the winter, it will do the same but for heating, because the whole ceiling is covered it achieves optimal heat distribution in the entire room. The ceiling heating radiates from above. So, in cold days it feels like how the warmth of the sun feels from above. Objects in the room and all areas surrounding the room are heated evenly by the heat radiation from the ceiling heating (Radiant Cooling Ceilings, n.d.).

The following **benefits** are essential for the cooling and heating ceiling:

- Heating and cooling with one system
- Directly perceptible radiant heat
- Even heat distribution
- Low air circulation, healthy indoor climate
- No annoying radiators
- Low energy costs
- Warm feet

On the next page (figure 94) is an fragment of the front facade were the heating and cooling ceiling can be seen on scale 1:20.

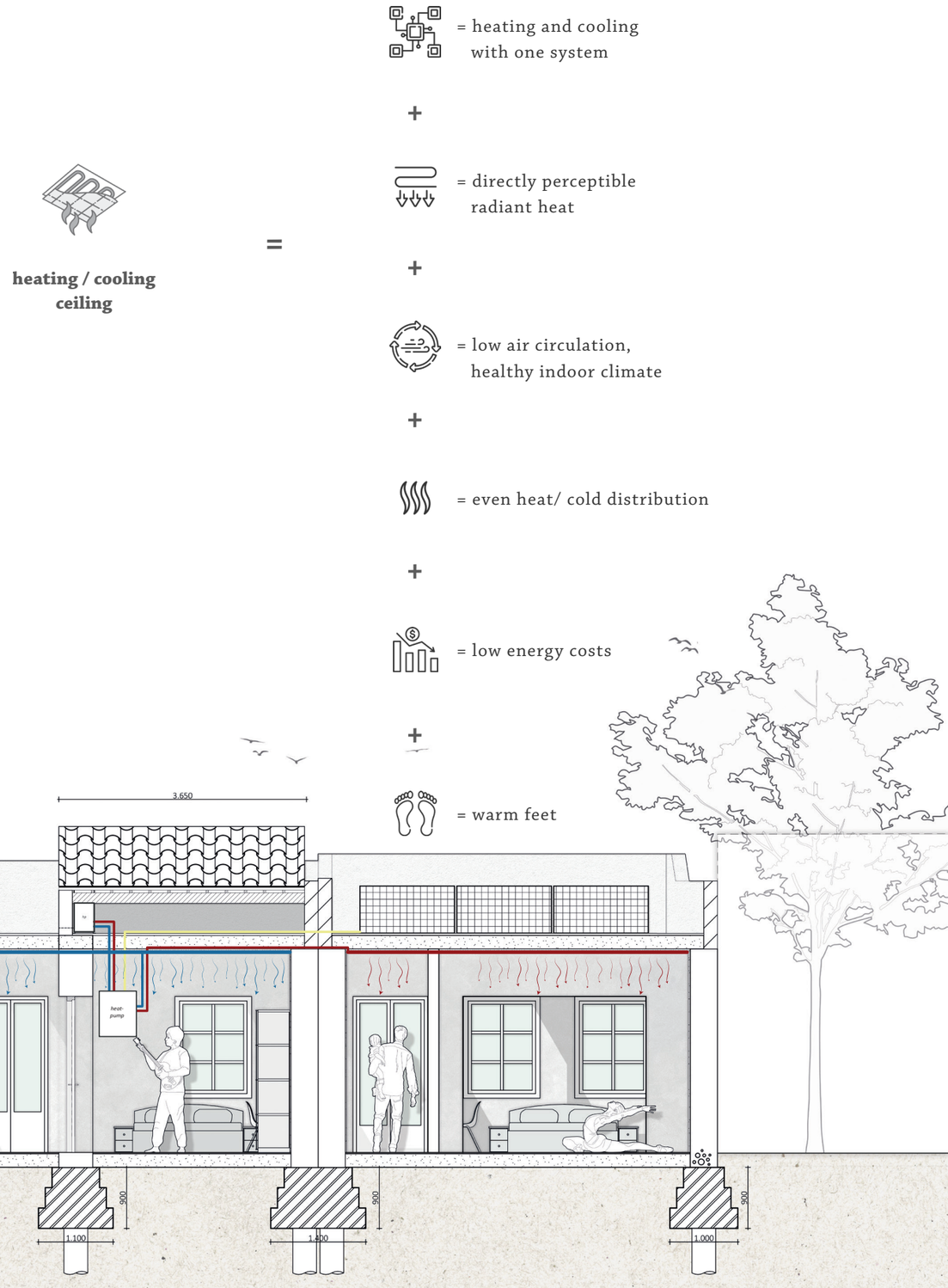
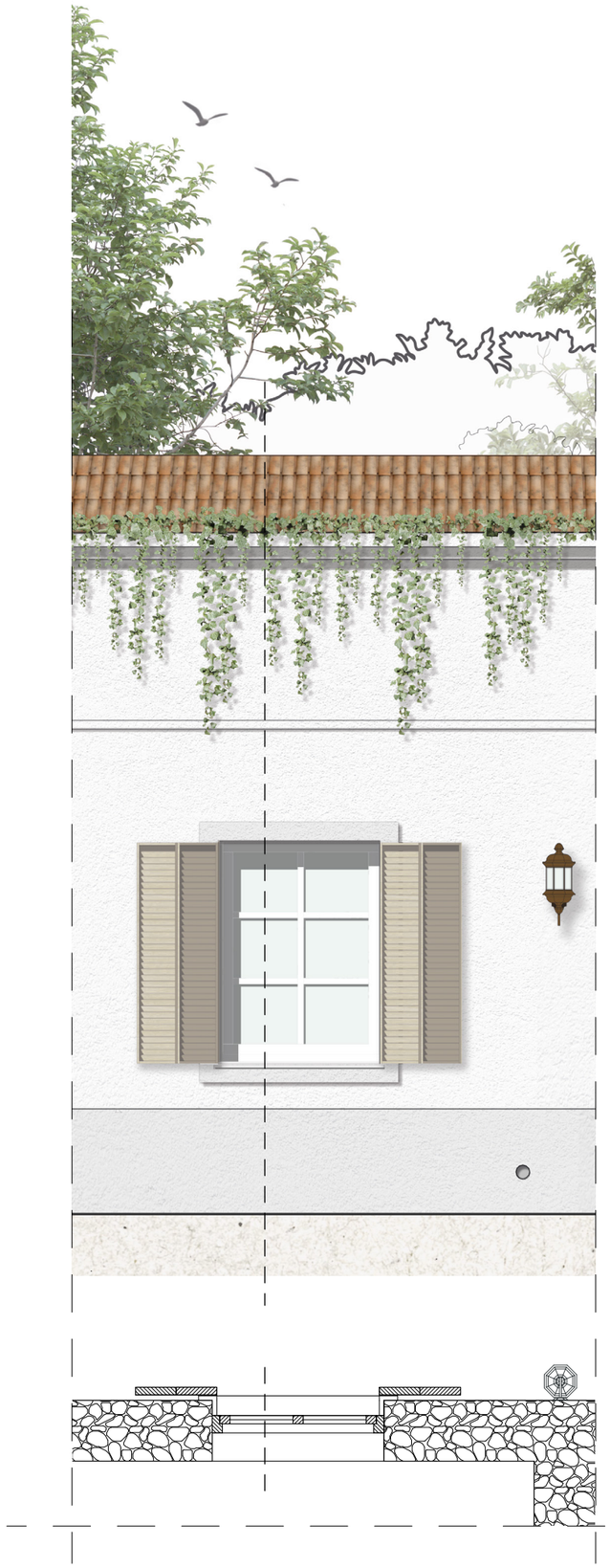


Figure 93. section A-A, heating and cooling ceiling



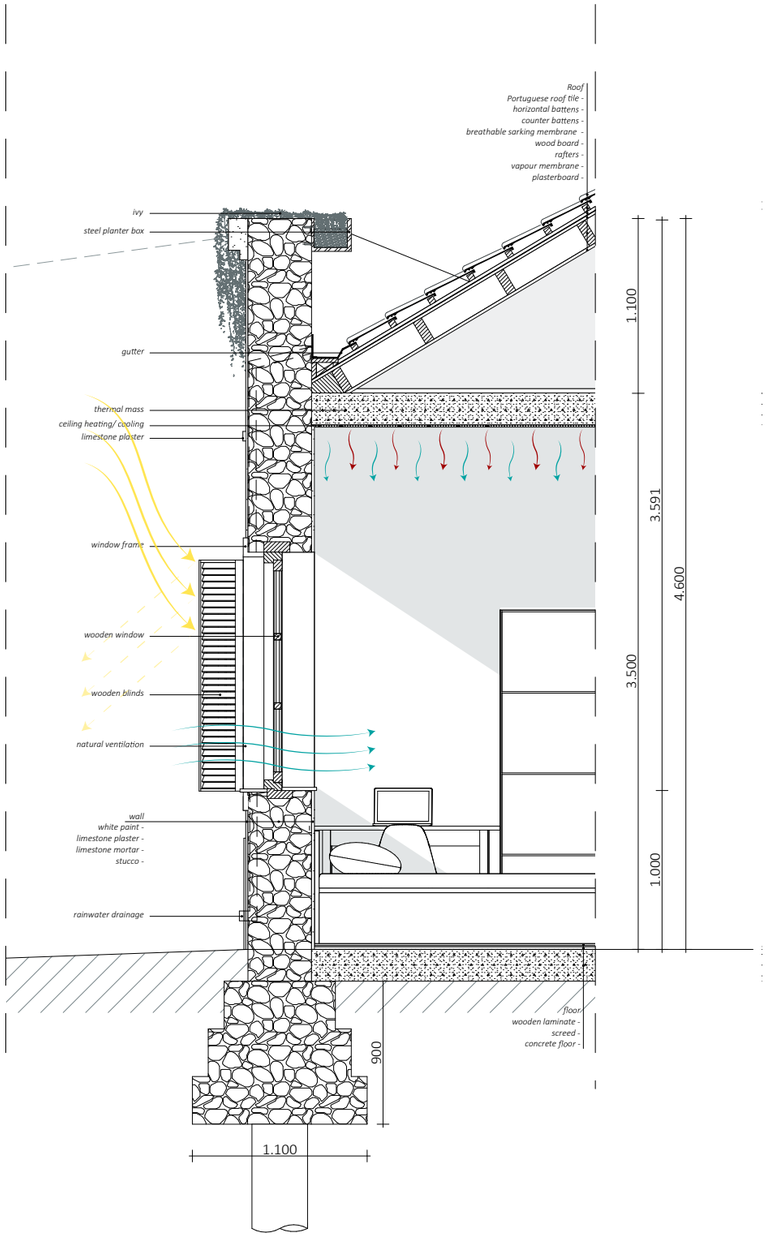


Figure 94. fragment 02

SCALE 1 : 40

2.5.8 Climate

Cooling and heating

The installation of a ceiling heating system with capillary tube mats, see figure 95. These are mounted on the ceiling and then plastered. The tubes are approximately 3 mm and the maximum thickness of the plaster may be 15 mm. This also makes it a very thin system on the inside of the ceiling (Plaster Ceiling, n.d.).

ceiling
15 mm plaster +
3 mm tube mats

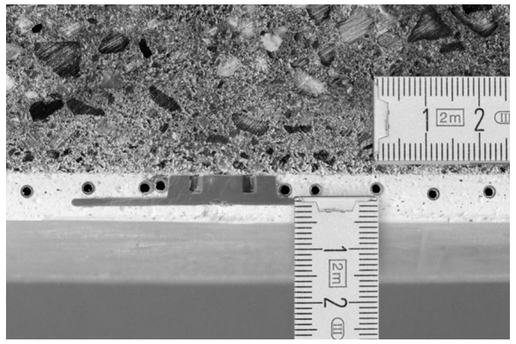




Figure 95. Cooling and heating ceiling
https://www.beka-klima.de/en/plaster-ceilings/

During autumn and spring the cooling can be with natural (cross) ventilation. During summer using cooling- and heating ceiling for cooling. During winter using cooling- and heating ceiling for heating. The total climate diagram can be seen in figure 96.

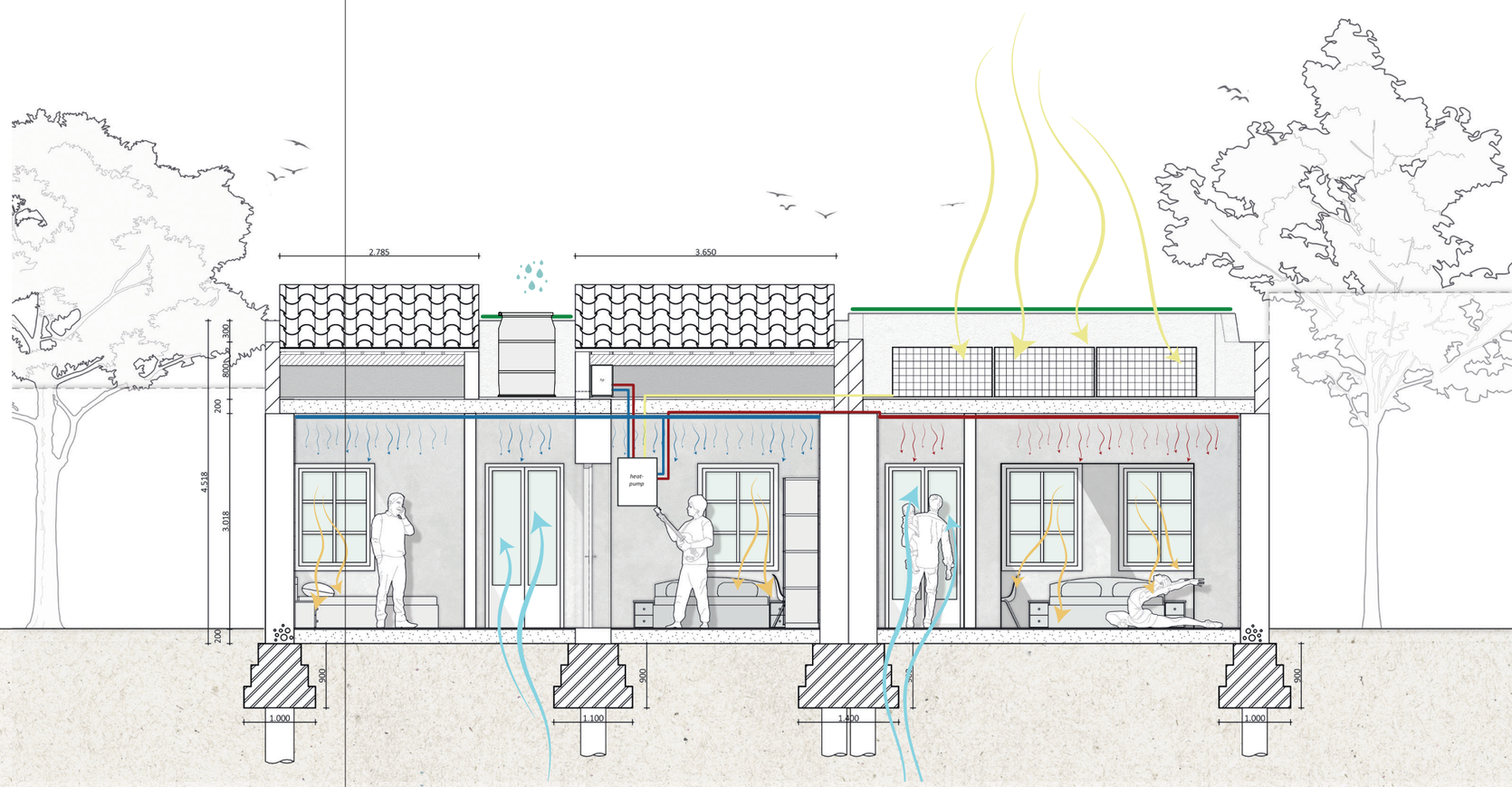


Figure 96. section A-A | climate

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Chapter 03

IMPACT ASSESSMENT

Impact of the redesign for Faro's heritage

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The impact assessment

3.1 INTRODUCTION

Redesign
the redesign (semester 2) based on values from the research (semester 1)

The redesign was based on the values that were researched during the first semester of the of the **graduation studio: Revitalizing Heritage.** The second semester is now about designing based on values. The redesign was be based on the values of locals and tourists. This redesign was for the plots of Rua do Bocage 104 & 106.

This research applied a method divided into three stages, integrating social media analysis, fieldwork in the neighbourhood of São Francisco and a site survey. The first set of data was collected through the manual analysis of social media posts on Instagram regarding the city of Faro. The second set of data was collected through the analysis of pictures taken of specific attributes from the façades in the neighbourhood of São Francisco. The result of the analysis from social media along with the collection of attribute information created the site survey **"O jogo de palavras"** (The word game). In this game locals and tourists could value specific attributes through the selection of predefined words, which show their personal opinions connected to values. The predefined words were derived from Tarrafa and Pereira Roders (2012).

Through this research it is possible to find out how the different attributes on the façades were valued. By extracting this data some design guidelines are set. The values and design guidelines could then be used for the redesign of the plots Rua do Bocage 104 and 106. The redesign process is explained in the previous chapter. This chapter elaborates on **the impact of the redesign.** Because this research was about the attributes and values of the façades this impact assesment is also going to be about the facade of Rua do Bocage 104 and 106.

3.2 METHODOLOGY

The impact assessment will be done by analysing the original facade and the facade after the redesign. Each attribute has their own score, classified in to neutral, positive or negative influence on the facade. This score and evaluation of the words comes the from excel table containing all results from the site survey "O Jogo De Palavras" (Appendix 3).

The attributes are categorized into positive, negative or neutral appreciation by the words they are paired with. Every word is also positive, negative or neutral. The more often different words are compared with an attribute, the more it counts. The words that have been classified into three categories:
Positive: pride, affordable, legal, authentic, beautiful, classic and healthy. Neutral: memories, typical , innovative and sustainable. Negative: expensive, cheap, illegal, ugly, aged and modern.

This means that it also counts the most in the facade appreciation table, figure 03. For the facade appreciation table, 0.00 is negative, 0.50 is neutral and 1.00 is positive. The attribute has a score of 0.40. This means that it has a negative influence on the facade.

	1.1	
Hashtag	Tourist	Locals
Pride		
Memories	6,67%	6,67%
Expensive		
Cheap	6,67%	6,67%
Affordable		
Legal		
Illegal		
Typical	33,33%	40,00%
Authentic	33,33%	6,67%
Beautiful	6,67%	6,67%
Ugly		33,33%
Classic	46,67%	20,00%
Innovative		
Aged	86,67%	86,67%
Modern		
Sustainable		
Healthy		

Figure 2. Game result table, picture 1.1

Pride	0,00
Memories	0,07
Expensive	0,00
Cheap	0,07
Affordable	0,00
Legal	0,00
Illegal	0,00
Typical	0,37
Authentic	0,20
Beautiful	0,07
Ugly	0,17
Classic	0,33
Innovative	0,00
Aged	0,87
Modern	0,00
Sustainable	0,00
Healthy	0,00
Total	10,71%
	0,40%

Figure 3. Facade appreciation Result table, picture 1.1

For example, in the first photo in the site survey (figure 1) the word aged is the most used and is 86.67% (figure 02).



Figure 1. Picture 1.1

This analyse will be done for every relevant attributes on the facade, to find out how the facade is valued in general by locals and tourists. The negative and positive will show in red en green on the facade. If an element has a score of 0,40 this means it is 0,10 % negative en will get red colour shade with this opacity. So, that in the analysis positive and negative can be analysed, but also how very positive or negative it is. The darker the red means that it is less appreciated and the darker the green means that it is more appreciated.

The score of the general facade appreciation will be made with another calculation. The calculation will be made by summing all the matching attributes (pictures) together and dividing by the number of attributes to get the average score of the facade. This will be done for the original and new facade, **to assess the impact on the facade.**

Facade appreciation
to understand how the facade is valued each attribute of the facade will be analysed

3.3 FACADE APPRECIATION

Original facade of Rua do Bocage 104 and 106
In this paragraph the facade of Rua do Bocage 104 and 106 will be analysed. Each attribute has it own score where 0.0 is the least appreciated (red) attribute and 1.0 the most liked, (green) 0.5 is neutral. The facade appreciation can be seen in figure 04.

Pictures matched to Rua do Bocage 104:

1.1 - Rusted metal door	*0,40*
2.2 - Single door & two window facade	*0,57*
1.6 - Dirty window and damages wall	*0,00*
1.9 - Wooden window frame	*0,83*
3.10 - One story building street	*0,20*

0,20
low facade appreciation score = not appreciated

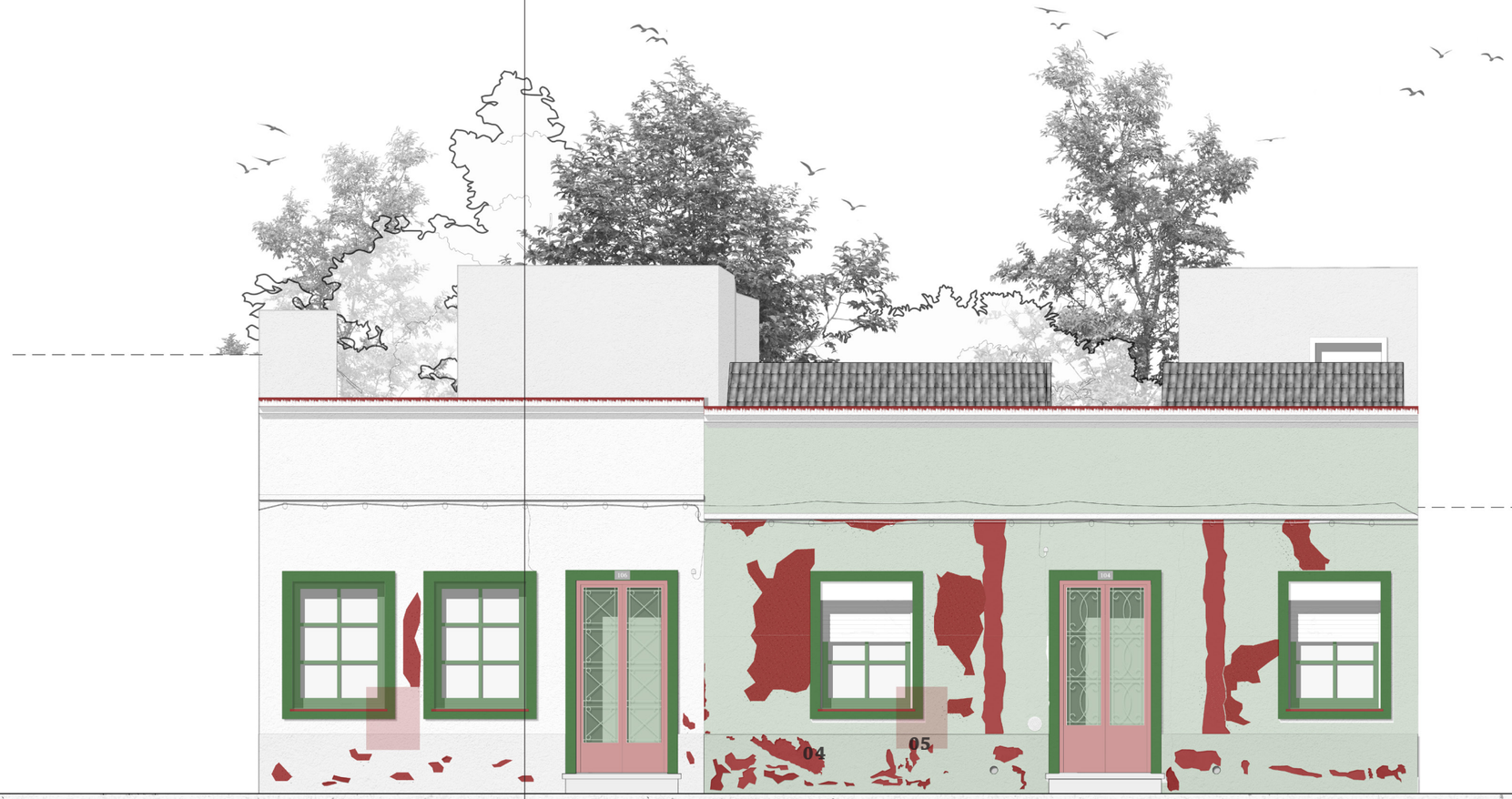
average score: *0,20*
The facade appreciation score is 0,40 this is a negative score, which means that this facade is in general not appreciated. Only the wooden window is considered to have a positive influence on the facade.

Pictures matched to Rua do Bocage 106:

1.1 - Rusted metal door	*0,40*
1.6 - Dirty window and damages wall	*0,00*
1.9 - Wooden window frame	*0,83*
3.10 - One story building street	*0,20*

0,35
low facade appreciation score = not appreciated

average score: *0,35*
The facade appreciation score is 0,35 this is a negative score, which means that this facade is in general not appreciated. Only the wooden window is considered to have a positive influence on the facade.



Negative
Positive

Figure 04. Facade appreciation before redesign

3.3 FACADE APPRECIATION

New facade of Rua do Bocage 104 and 106
During the design process the positively scored attributes are kept. Only the wooden windows are restored, because the current wooden windows were in bad conditions. The negatively valued attributes are changed with attributes that have a positive influence on the facade. Also their are some new positive influences created on the facade. The facade appreciation after the redesign can be seen in figure 05.

Pictures matched to Rua do Bocage 104:

3.1 - Wooden rectangular door	*1,00*
2.2 - Single door & two window facade	*0,57*
1.3 - Greenery on the facade	*0,97*
3.5 - Lantern	*0,98*
1.9 - Wooden window frame	*0,83*
2.9 - Blinds	*0,74*
3.10 - One story building street	*0,20*

0,76
high facade appreciation score = appreciated

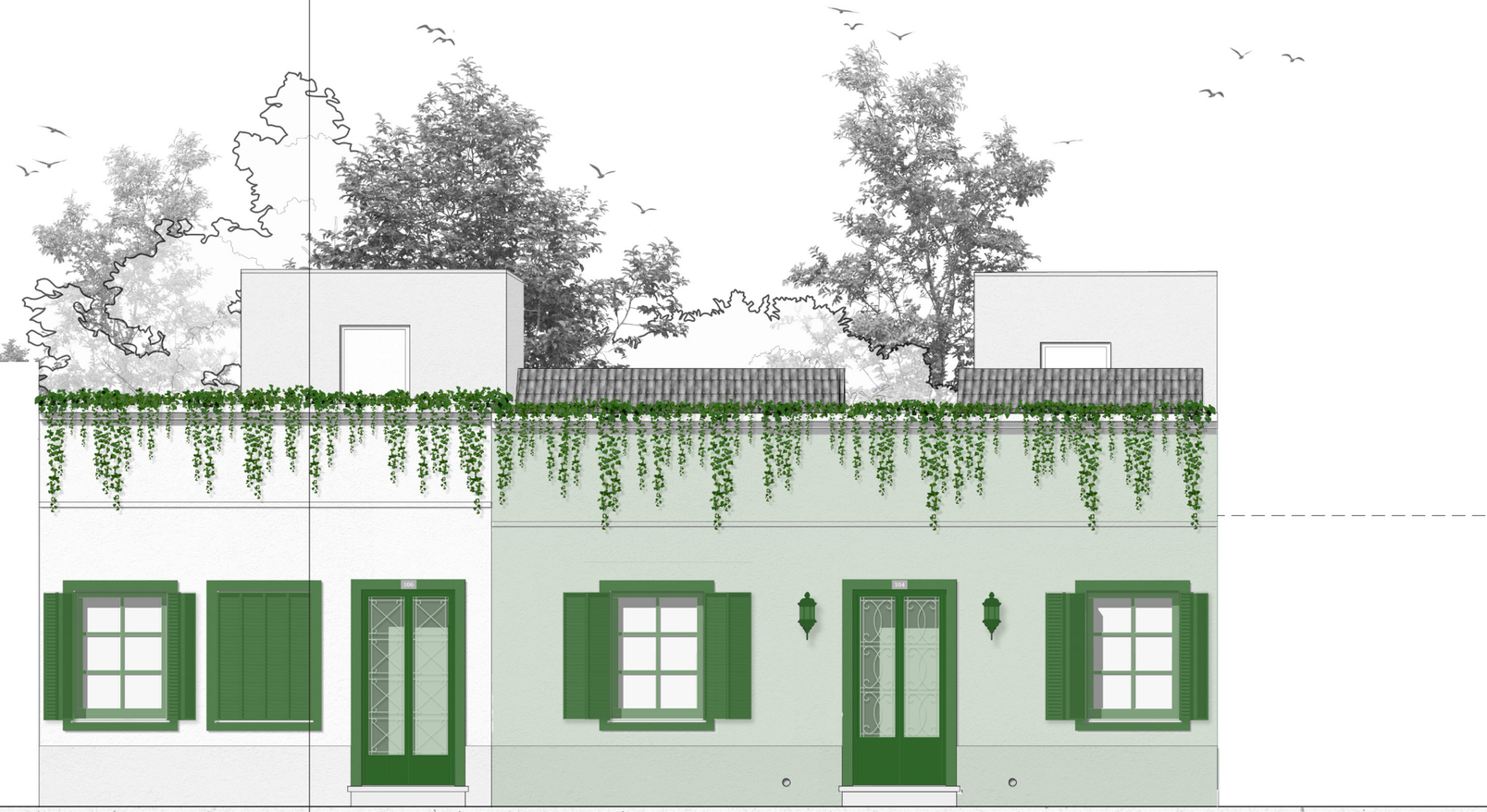
average score: *0,76*
The facade appreciation score is 0,76 this is a positive score, which means that this facade is in general appreciated.

Pictures matched to Rua do Bocage 106:

3.1 - Wooden rectangular door	*1,00*
1.3 - Greenery on the facade	*0,97*
1.9 - Wooden window frame	*0,83*
2.9 - Blinds	*0,74*
3.10 - One story building street	*0,20*

0,75
high facade appreciation score = appreciated

average score: *0,75*
The facade appreciation score is 0,75 this is a positive score, which means that this facade is in general appreciated. The facade appreciation score has increased from 0,35 to 0,75 which is an significant difference.



Negative

Positive

Figure 05. Facade appreciation after redesign

3.4 CONCLUSION

Rua do Bocage 104

The facade appreciation score has increased from **0,40 to 0,74** which is an significant difference. This means that the redesign has a positive impact on the facade valuation.

Redesign
higher facade appreciation score = positive impact of the redesign

Rua do Bocage 106

The facade appreciation score has increased from **0,35 to 0,75** which is an significant difference. This means that the redesign has a positive impact on the facade valuation.

Redesign
higher facade appreciation score = positive impact of the redesign

This was done by following the design guidelines from the first chapter. These design guidelines were based on a more positive valuation from the community. By applying these design guidelines the facade appreciation increased. Looking back at the design choices, it can be concluded that they were the right choices for a value-based redesign, figure 06. This does not mean that there is no other way to redesign.

3.5 DISCUSSION

This method of value based design can be improved by **adding more facade attributes** in to the site survey "O jogo de palavras", because the pictures of the attributes now were very scarce in options. This change can benefit to be more preciser in the valuation. There are much more attributes that can be valued. Because of this, there was some lack of information and also many assumptions had to be made.

For example, the blinds picture 2.9 were very positively valued, but they were aluminium blinds. We do not know if wooden blinds also would be valued positively. T**his creates the demand for more in-depth and broader research.**



Figure 06. Facade after redesign

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Chapter 04

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Exta documents for the supporting the Graduation Book

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I

APPENDIX

Dictionary Definitions

APPENDIX I | DICTIONARY DEFINITIONS

Definitions
Every hashtag will be explained according to its dictionary definition. Afterwards the hashtag-value connection will be clarified, all these value explanations are referring to the paper of Tarrafa and Pereira Roders (2012)

Pride
A feeling of being pleased or satisfied that you get when you or people who are connected with you have done something well or own something that other people admire ("Pride," n.d.)

Value connection
Social: one of the secondary values of the social value, emotional collective, gets described as cultural identity which includes pride.
Political: symbolic is one of the secondary values of the political value containing emblematic and prosperous perceptions.

Memories
A thought of something that you remember from the past ("Memories," n.d.).

Value connection
Social: related to secondary value described as "emotional individual" referring to personal life experiences.
Historic: In the historic value, some secondary values end with: "… , which are now part of history". This history is something people can convey memories to.

Expensive
Costing a lot of money ("Expensive," n.d.).

Value connection
Economic: one of the secondary values connected to the economic value is allegorical which is focussed on publicizing financial property.

Cheap
Costing little money or less than is usual or expected ("Cheap," n.d.).

Value connection
Economic: one of the secondary values connected to the economic value is allegorical which is focussed on publicizing financial property

Affordable
Able to be bought or rented by people who do not earn a lot of money ("Affordable," n.d.).

Value connection
Economic: one of the secondary values connected to the economic value is allegorical which is focussed on publicizing financial property.

Legal
Allowed by the law ("Legal," n.d.).

Value connection
Political: part of this value is explained as management which include strategies and policies.

Illegal
Not allowed by the law ("Illegal," n.d.).

Value connection
Political: part of this value is explained as management which include strategies and policies.

Typical
Showing all the characteristics that you would usually expect from a particular group of things ("Typical," n.d.).

Value connection
Historic: related to the secondary value historic artistic which is a testimony of stylistic attributes that are now part of history.
Aesthetical: connected to the secondary value evidential which relates to an authentic exemplar of a decade.
Age: from the secondary value existential which refers to marks of the time passed on the attributes.

Authentic
Known to be real and what somebody claims it is and not a copy ("Authentic," n.d.).

Value connection
Historic: related to the secondary value historic artistic which is a testimony of stylistic attributes that are now part of history.
Aesthetical: connected to the secondary value evidential which relates to an authentic exemplar of a decade.
Age: from the secondary value existential which refers to marks of the time passed on the attributes.

Beautiful
Having an attractive quality that gives pleasure to those who experience it or think about it ("Beautiful," n.d.).

Value connection
Aesthetical: secondary value artistic referring to an original product of creativity

Classic
Attractive, but simple and traditional in style or design; not affected by changes in fashion ("Classic," n.d.).

Value connection
Historic: related to the secondary value historic artistic which is a testimony of stylistic attributes that are now part of history.
Scientific: secondary value conceptual, integral materialization of conceptual intentions.

Innovative
Using new methods or ideas ("Innovative," n.d.).

Value connection
Scientific: workmanship, human labour leading to an original result
Age: from the secondary value existential which refers to marks of the time passed on the attributes.

Aged
Old: having lived or existed for many years ("Aged," n.d.).

Value connection
Historic: related to the secondary value historic artistic which is a testimony of stylistic attributes that are now part of history.
Age: from the secondary value existential which refers to marks of the time passed on the attributes.

Modern
Using or based on recently developed ideas, methods, or styles ("Modern," n.d.).

Value connection
Scientific: secondary value conceptual, integral materialization of conceptual intentions.
Age: from the secondary value existential which refers to marks of the time passed on the attributes.

Sustainable
causing, or made in a way that causes, little or no damage to the environment and therefore able to continue for a long time ("Sustainable," n.d.).

Value connection
Scientific: secondary value conceptual, integral materialization of conceptual intentions.
Ecological: the secondary value 'essential' is described as ecological ideologies shown on a design or construction.

Healthy
Having, showing, or encouraging good health ("Healthy," n.d.).

Value connection
Ecological: Spiritual as a secondary value related to harmony between the building and its environment.

Ugly
Unpleasant in appearance ("Ugly," n.d.).

Value connection
Aesthetical: secondary value artistic referring to an original product of creativity