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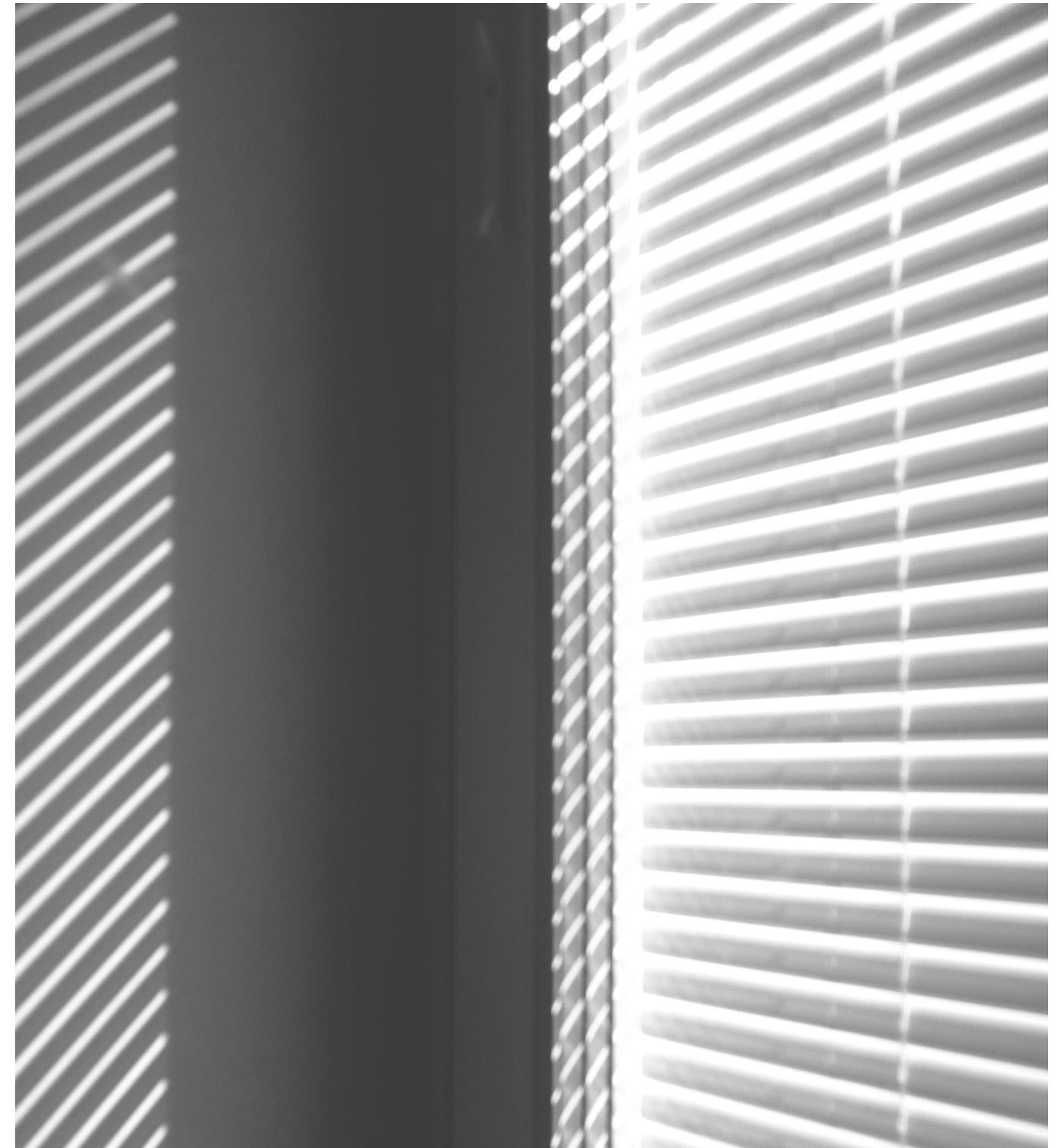
# The positive light

Light as an emotional generator and flexible  
space creator in domestic quarantine.

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## THE POSITIVE LIGHT

Light as an emotional generator and flexible space creator in domestic quarantine

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To my nephews. Quarantine was not made for us, but we made it.

## Abstract

This Master’s Thesis is a response to the personal willingness of obtaining something positive from the global crisis, caused by Covid-19.

In such a situation, an understanding of the role of light in domiciles is appropriate not only functionally, but emotionally, as new ways of living in space are introduced. Indeed, flexibility has turned to be a claimed characteristic in the house, as well as access to daylight and outdoor spaces. Those aspects are to be considered positive in the near future. Nevertheless, what can be considered as positive light and the extent to which it is related to flexibility is a factor to study. How positive light can be achieved is also a factor to consider.

Throughout this project, **positive light** will be defined under the exceptional circumstances of quarantine. The distribution of a survey, a discussion of architectural theories, as well as a study of **positive light** in my personal home will be carried out in order to gain an insight into its definition.

**Keywords:** positive, light, emotional, quarantine, confinement, house, window, resources, perception, comfort.

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1.- Introduction

1.1.- Purpose

The situation Covid19 virus is developing across the Globe is already considered to be the most threatening since the World War II. Self isolation and social distancing are the main restrictions, suggested by the World Health Organization, in order to control the disease.

This project was formulated with the personal objective of obtaining something positive from the current international crisis, after making the decision to stay in Sweden and self isolate.

Light is understood to be an essential tool for well being, especially in a situation of domestic confinement. I also believe that individuals, regardless of personal circumstances, have the ability to adapt themselves to exceptional environments, mainly, as a response to a basic survival instinct.

Furthermore, one of the main challenges domestic isolation can bring to people is the inclusion of uses that were usually executed outside the household. Such exceptional circumstance triggered my interest in understanding individuals’ resilience and adaptation to their own domestic spaces, from a lighting point of view.

Facing Covid-19, and the awareness of confronting similar situations arising in the near future, how light can contribute to enhance such a new way of living the domestic space is examined. Such light, would be called positive.

In order to contribute to the field of research on *positive light*, three main steps were made. First, a group of individuals living under quarantine were requested to answer a survey, with the objective of understanding their situation. Secondly, the results were compared with architectural theories around the concept of home. Finally, **my lighting conditions were tested, searching for personal positive light, in a personal context of home quarantine/ confinement.**

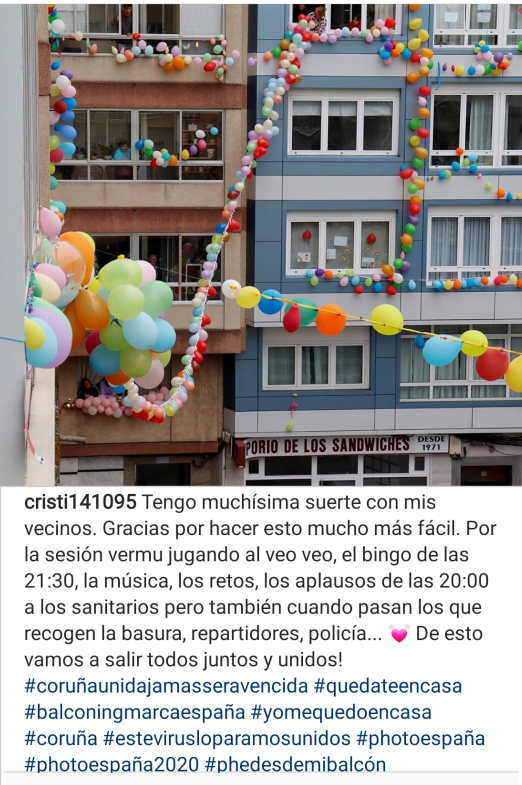


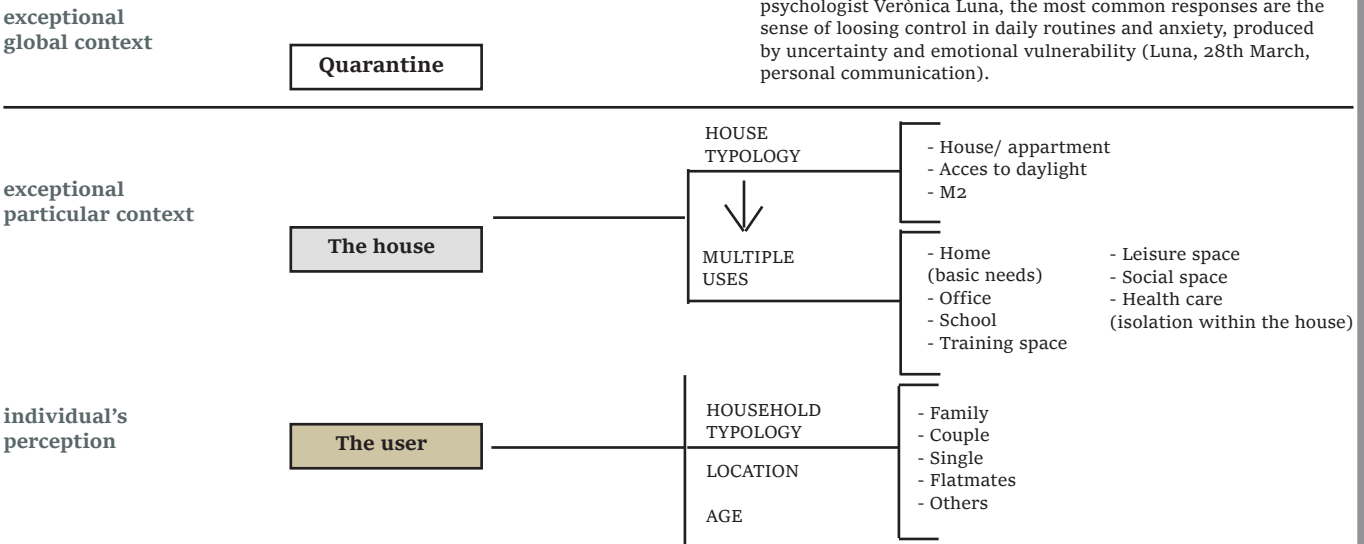
Figure 1. Via Instagram. 23th March 2020  
Free traduction. “I am very lucky with my neighbours. Thank you for making this easier. For the vermouth sessions playing hide and seack, bingo sessions at 21:30, for the challenges, applauses to health workers at 20:00, and also the applauses to the cleaning services, police officers... We will all get out of this together!”  
By @cristi141095

1.2.- First steps

Being aware of the complexity and the constant changing situation, the decision to make a general survey was taken as a starting point with the objective of getting a better understanding of confinement in Spain. In March 2020, it was considered to be one of the most affected countries by Covid 19.

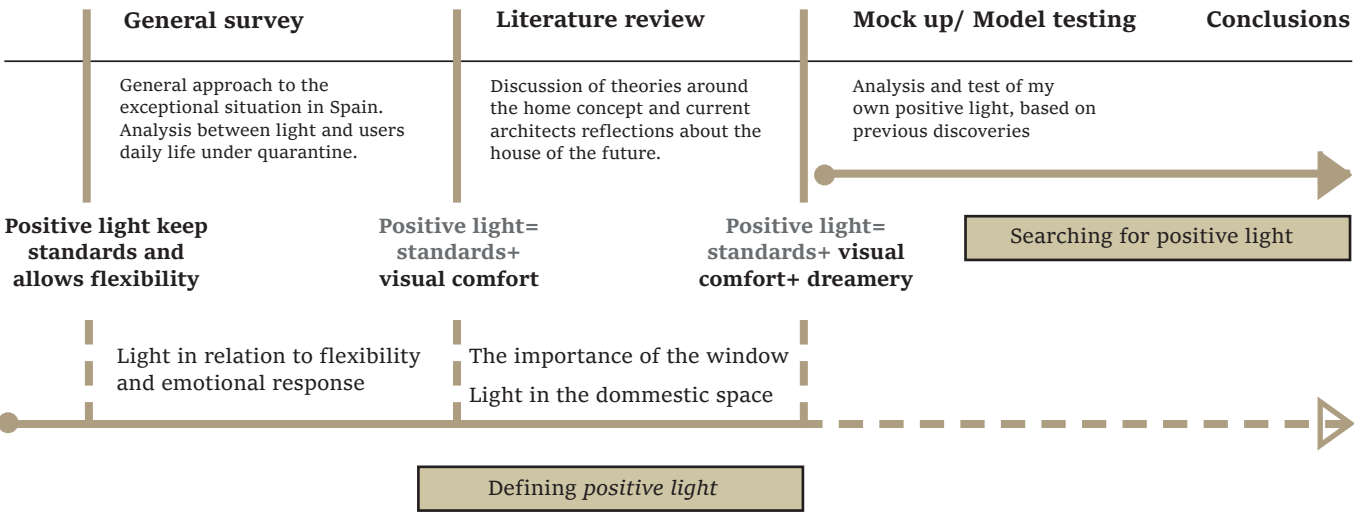
The graph below (Scheme 1) shows the aspects of the house that could condition individuals’ perception, which are those that can influence answers in the general survey. Moreover, those conditions can give further information about individual behaviour, the role of light in quarantine and its relation to possible new uses.

Scheme 1. Aspects that are considered in participants’ responses



2.- Methodology

Scheme 2. Project methodology



3.- The survey

In the survey formulation psychology is considered in order to understand the complexity of the situation, as well as to gain engagement from the participants. The psychologist Verónica Luna suggested to formulate the questions from an emotional perspective. Additionally, the photographer Elisenda Fontarnau made further suggestions about Copyright (Fontarnau, 29th March, personal communication).

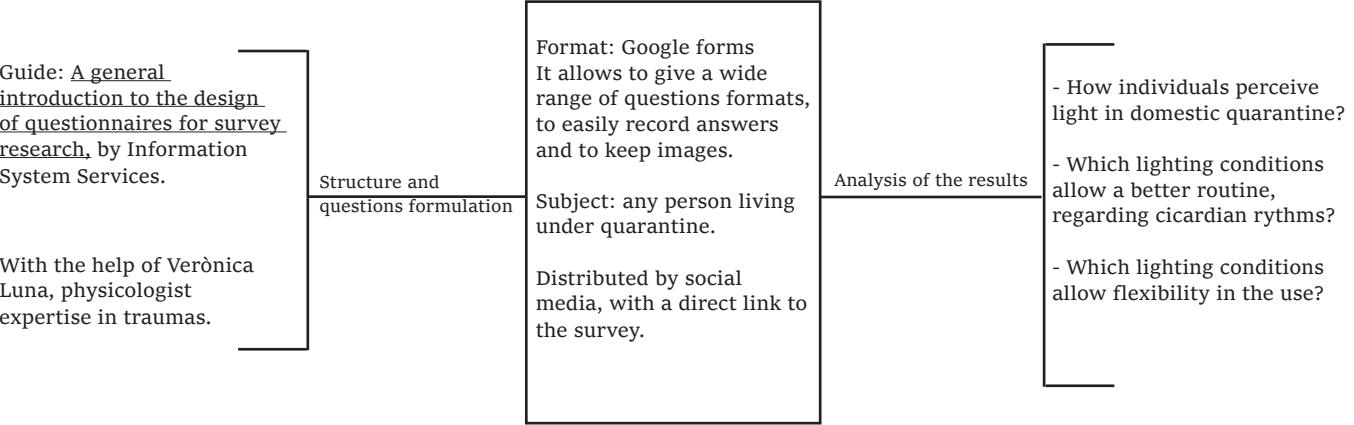
As Verónica Luna pointed (Luna, 28th March, personal communication), the ability to keep activity in a common routine was important in a context of quarantine. Therefore, the relationship between *positive light* and cycardian rhythms is considered, in which individuals tend to feel more active during daytime, and calmed during nighttime. This brings comfort to the performance of different tasks, which can also be related to standards in use.

Positive light= standards that help to keep routine

Despite such consideration, *Positive light* is presumed to be related to individual perception or visual joy. Therefore, the main question required subjects to take a picture of a space from their domiciles (see Appendix- Section I, Question 10). Moreover, I desired to know which light sources of the house participants considered to be positive in such way, at particular moments of the day. To which extension those light sources were related to the currently desired flexible home was also studied.

3.1.- Structure

Scheme 3. Structure and analysis of the survey



Consult the model survey in Anppendix- Section I, pg.30



3.2.- Limitations

The survey was distributed in Spain, based on my personal relationship with the country and due to its exceptional situation in relation to Covid19 (being one of the most affected countries). During the dates the survey was available, between the 8th and 23rd April 2020, Spain had reached a month under lock down. With the predictions of extending the State of Emergency, citizens were only allowed to leave their homes for basic needs.

Being social media the way of distribution, people above 65 years old may not have been able to participate. Due to the fact that the survey is in English and not local languages, a percentage of the participation may be lost. Due to Copyright advice and other legal aspects, minors were not considered. Nevertheless, it was an open link, easily accessible by any participant.

The survey is formulated from an emotional approach, which can provide further information about perception. As Elisenda Fontarnau suggested, lighting temperature should not be considered as a factor of study, due to the use of different devices and their big impact on the display of the picture. However, other questions were introduced to obtain quantitative data that could be related to standards (eg. uses of the space).

3.3.- Results

In total, 22 subjects took the survey. Unexpectedly, 2 of them were from different countries, which is why are not represented in the results below.

Q1 16 participants are from Barcelona, 3 from Madrid and 1 from Mallorca.

Q2 12 of the subjects are between 18 and 35 years old.

Q3 17 people live in an apartment with a balcony. This typology of house is common, mostly, in the average of age mentioned earlier.

Q4 The majority of participants (6) live in a space of more than 100m2. This trend is equally followed by 5 people, whose choices are 40-60 or 60-80 m2, respectively. Only 2 people live in an apartment of 25-40 m2.

Q5 10 people home’s score 7 or 8 out of 10 in level of brightness. There is only one person who considers the house to be generally dark (2/10). This subject lives on their own, in an apartment without balcony of 25-40 m2.

Q6 9 of the subjects are living with their families, while 5 live on their own. The rest are equally divided between “couple” or “flatmates”. The participants in the first group mostly live in a space of more than 100m2.

Q7 Only 4 subjects have changed their household, due to quarantine.

Q8 15 subjects are working or studying from home.

Q9 11 subjects hardly ever used to spend time at home, due to work and social life. This is common in participants between 18 and 35 years old. Other demonstrations of the time spent at home were: I used to spend most of the time at home afterwork/ I used to spend most the of time at home during the weekends. These options were chosen by 5 subjects, respectively.

Q11 There is a clear tendency to take the requested picture in the morning, the most common being between 11:00 and 12:40. Only four people took the picture at nighttime.

Figs. 2-9 Pictures received from the survey.  
All subjects signed acceptance of Copyright. Consult Appendix- Section II (pgs.32-35) for all original images and graphs



Fig. 2



Fig. 3



Fig. 4



Fig. 5

Q12 This graph shows the tendency in size of the space shown. Only one subject is not shown in the graph, due to the fact that their answer does not meet the requirements (“more than 30m2”).

Table 1. Size of the spaces shown in the survey. Q12.

2x1	3x1	4x2	5x3	6x9	8x4	9x17	10x13	12x10
	3x5	4x4	5x3	6x10				
		4x6	5x4					
		4x7	5x4					
			5x5					
			5x5					
			5x8					

Q13 Regarding three word description, “calm” is used by 7 subjects. At the same time, “relax” is the word chosen by 4 other participants. The same amount of repetitions is done with “light”.

Table 2. Subjects 3 words description of the pictures taken in the survey. Q13.

Picture typ.	Subjects	W1	W2	W3
Daytime	S01	cozy	cheery	light
Nighttime	S02	hobby	work desk	production
Daytime	S03	bright	calm	good vibes
Daytime	S04	personal	fresh	relax
Daytime	S05	Sunday	morning	relax
Daytime	S06	light	outdoor	nature
Daytime	S07	light	freedom	privacy
Daytime	S08	relax	sunny	place
Nighttime	S09	shelter	calm	reflection
Daytime	S10	calm	peace	self-knowledge
Daytime	S11	relax	calm	creativity
Daytime	S12	quiet	calm	light
Daytime	S13	wide	alive	x
Daytime	S14	big	clear	spacious
Daytime	S15	relax	home	loneliness
Daytime	S16	green	spacious	cold
Nighttime	S17	cozy	calm	family
Nighttime	S18	rest	calm	family
Daytime	S19	light	birds	life
Daytime	S20	relax	pure	nature

Group in relation to: Calmness Light Outdoor

The majority of adjectives in relation to calmness and light are described in a daytime situation.

Q14 The difference between those who have made changes in the space shown, in a bigger or smaller scale, is only 4. No changes is the tendency.

Q15 Within the 9 subjects who have made some changes, 6 of them are related to light. Here are the answers:  
“Sofa and chairs are faced to the windows”  
“Lighting”  
“Move the balcony table to the side to have a wider view. Bring the outdoor long chair in to be warmer, but still feeling I’m outdoor”  
“Furniture and lighting”  
“I added a floor mat, so I can sit outside or closer to the door for natural light”  
“Table moved against the wall due to luminaire and changed to a more comfortable chair”

Q16 The results show that spaces exposed tend to have more than one use, being 3 uses the common average. Within all possibilities, “Leisure activities” is the most frequent use given to the space (repeated 18 times). It is followed by 9 for “Social interaction” and “Eating”, “Physical activity”, and 8, for “Working”.



Fig. 6



Fig. 7



Fig. 8



Fig. 9



3.4.- Analysis and discussion

There are only four pictures that show artificial light. There was an evident tendency to take the picture at daytime. In such cases, **windows** are shown in 8 different pictures. Thus, in 4 cases, a close opening is shown through reflections and lighting distribution (eg. Figs. 10 and 12).

The size of the houses can be considered enough in relation to the household members. In these circumstances, there are no exceptional situations that suggest there is a big impact on the user. Those subjects who are sharing quarantine with their families, tend to live in bigger spaces; those who are single or living with their partners, the smallest. In addition, there are only 4 cases of people who have changed their households and the houses are generally considered to be bright.

There is only one exception. A subject living on their own in an apartment with no terrace and presumably dark, whose picture, is showing a patio (Fig.11). I presume it is a first floor apartment with little access to daylight. Therefore, I consider this case as evidence of an individual's relation to daylight in domestic quarantine, where the **relation to outdoor is crucial**.

Considering the small amount of time subjects used to stay at home before quarantine, there might be a large emotional impact behind. Furthermore, thirteen people are currently working or studying from home. Nine of which, show the space where this activity is developed.

(Q15) As the *calmness* group adjectives were the most used to describe a daytime scenario, in opposition to the requested "active and productive" space, this could seem a contradiction. Nevertheless, it can also be an example of how **individuals search for visual comfort or joy, regardless of the activity is being developed**. The fact that most of the changes within the spaces are related to light needs is remarkable. It is fair to state, though, that those activities that are significantly different, in terms of illuminance requirements, are executed in a space with a more homogeneous lighting distribution.

When the results were analysed, Spaniards were about to accomplish more than one month of confinement. From that moment on, subjects may have made further changes in their homes, as it was difficult to foresee when the situation was going to change again.

3.5.- Conclusions and further steps

**How individuals perceive light in domestic quarantine?** Subjects under quarantine search for outdoor connections, through a window or a balcony. Therefore, this provides evidence that light does contribute to enhance living conditions, especially, in a context of quarantine.

**Which lighting conditions allow a better routine, regarding cicardian rythms?** It has been demonstrated that pictures with more exposure to daylight or outdoor connections are preferred to be shared, in relation to activity and productivity.

**Which lighting conditions allow flexibility in the use?** Flexibility not only relies on standards, but on a combination of visual comfort or joy for the users, even in daylight situation. Daylight is a well-considered aspect in the house, but it is not necessarily related with the convenient light levels or lighting distributions that different uses require. This may trigger the idea of visual comfort preferences for different individuals.

There is not only a measurable light, which can scientifically help us to perform tasks in better conditions. With the incorporation of simultaneous and new uses of space, a chance to rely on perception is needed.

Windows, and therefore, daylight play with regard to the visual joy or comfort of the parcticipants in this research. As a consequence, different activities are executed together around them. In the next step, I discuss their role in the house with architectural theories.

Positive light= standards+ visual comfort



Fig. 10



Fig. 11



Fig. 12



Fig. 13

Figs. 10-13 Pictures received from the survey. Consult Appendix- Section II (pgs.32-35) for all original images.

4.- Literature discussion. The window in the house.

4.1.- Its value

In reference to the book, *Home: A Short History of an Idea*, windows were firstly considered a mere mechanical way of ventilation, something that was directly related to the prevention of disease. (Ref.1)

Since daylight is a crucial element in domestic space, an idea that was introduced in Scandinavian countries (Ref.2), architects have played a big role in the democratization of comfort. In a number of cases, depending on the location, light is an added value that becomes exclusive. It is something that makes openings and access to daylight a right for those who can afford it. Such is the case of Spain. "The lockdown has highlighted the need to improve housing conditions in the country, as millions of homes lack balconies, natural light and proper ventilation". (Ref.3).

Nevertheless, in a European Southern country, daylight may have been taken for granted along the years, or even not taken into consideration at all. This could have also been triggered by an outdoor cultural background. In the book *Casa collage. Un ensayo sobre la arquitectura de la casa*, Xavier Monteys and Pere Fuertes make some reflections about the flexibility of the house, the ambiguity in its use and its playfulness. Nevertheless, all those aspects are related to spatial distribution or product design, hardly ever to openings or daylight conditions.

Overall, there is evidence to suggest that, without a clear purpose focused on openings, there are few possibilities of a real change towards more flexible homes.

In his book, "*The eyes of the skin*", Pallasma wrote: "In our time, light has turned into a mere quantitative matter and the window has lost its significance as a mediator between both private and public, shadow and light. Having lost its ontological meaning, the window has turned into a mere absence of the wall". (Ref.4) Nevertheless, domestic isolation may bring more significance to the window, as it is the only way to get a sense of outdoors.

In terms of views, there is another paradigm that could be rethought. As users, we have always searched for a "good view". The best ones, are usually considered an extra value for the house. However, what we can do with available openings should be considered. In consequence, the boundaries could be moved.

It is fair to state that it is not only what one can see, but what one decides to show or to hide. Some sociologists have related behaviour towards outdoor life as a cultural heritage from religion, especially, from Catholicism. Spain is one the countries where, in comparison to Scandinavia, window blinds are much more common. Well known for its religious tradition and Arabic culture, Spanish citizens are considered to be more concerned about what outsiders can see. Of course, there is also an obvious need to block warm weather from sunny days. (Ref.5)

Referring back to the article mentioned earlier a number of Spanish architects have already shared their thoughts about the needs of the near future. Carlos Lamela, suggests: "We architects must imagine and build homes that make natural light, ventilation and simple, comfortable movement a priority, regardless of the type of housing. We are learning that it is necessary to project versatile houses for an unpredictable world". (Ref.3)

While it is inevitable to think new solutions in the near future, concentrating our efforts on the present is also advisable. The real change may take time, due to the investment that is required whilst experiencing both a health and financial crisis. As a consequence, an observation of the possibilities of our homes with the windows they own is needed. Consequently, our perception of daylight would be more positive, either helping us to perform tasks, or bringing joy to space by highlighting different lighting qualities.



Fig. 14



Fig. 15

Fig. 14 Views from the street to a particular first floor house in Stokholm (Sweden)

Fig. 15. Views from the street to a particular first floor house in Málaga (Spain)

1.- Rybczynski, W., 1986. Home: A Short History Of An Idea. 1st ed. Buenos Aires: emece, p.177.  
2.- Rybczynski, W., 1986. Home: A Short History Of An Idea. 1st ed. Buenos Aires: emece, p.177.  
3.- Letón, S., 2020. Coronavirus Crisis Reveals Poor State Of Spanish Apartments. [online] EL PAÍS. Available at: <https://english.elpais.com/economy\_and\_business/2020-05-07/coronavirus-crisis-reveals-poor-state-of-apartments-in-spain.html> [Accessed 25 May 2020].  
4.- Pallasmaa, J., 2012. The Eyes Of The Skin. 3rd ed. West Sussex: John Wiley and Sons Ltd, p.51.  
5.- Suárez, M., 2020. Por Qué Los Españoles Somos Los Únicos Europeos Obsesionados Con Las Persianas. [online] EL PAÍS. Available at: <https://elpais.com/elpais/2018/04/06/icon/1523015770\_991742.html> [Accessed 25 April 2020].



4.2.- Its playfulness

“Night of the Window”

(...)  
The arms of the night  
Enter through my window,  
Great brown arms  
With bracelets of water.  
On blue crystal,  
I played in the river at dawn  
I watched the wounded moments  
Pass away  
(...)  
(Ref.6)

“Images of one sensory realm feed further imagery in another modality. Images of presence give rise to images of memory, imagination and dream. The chief benefit of the house (is that) the house shelters daydreaming, the house protects the dreamer, the house allows one to dream in peace”, writes Bachelard. But even more, an architectural space frames, halts, strengthens and focuses on thoughts, and prevents them from getting lost. We can dream and sense our being outdoors, but we need the architectural geometry of a room to think clearly.” (Ref.7)

In relation to the mentioned analysis of the survey, this quotation is considered to be the greatest reflection of what a window can contribute to the users’ imaginary, especially under quarantine. Once again, an architecture theory is not fully sustained, nor even partially, by the effect of shaped daylight. Therefore, Pallasma’s statement could be formulated to state: We can dream and sense our being outdoors by the window and with the architectural geometry, but we need to know the relation between them in order to think clearly.

After all, a window is not only part of a building, meaning an architect’s choice, but also the possible generator of dreamery. This particularity is fully conditioned by our perception of the quality of light, its distribution, the material and the views. In all these aspects there is, once again, an important daylight factor and percentage of reflection that could be rated between all possible standards. Nevertheless, **in such exceptional indoor circumstances, the importance of perception and personal interpretation of light should be highlighted.** Therefore, the possibilities a window has, as a shaper of light (considering street light as another light source that has to be taken into account) does not need to end in an architect’s decision.

It is well known how different Architects, who work frequently with glass, have always noted its playfulness. The experimentation required in the design process can be complex at points. However, as Rodrigo Muro, Architect and Lighting Designer, highlighted, the simple act of adding a filtered colour to a glass, can fully change the perception of our environment. (Ref.8)

Another current example of this new significance of the window is the custom of leaning out of the window or clapping our Health professional from balconies. This has often included the idea of offering shows or sharing music. Indeed, the window or the balcony is the new theatre box for a possible play.

With the image of “Quarantine scenes”, made by JAJ Architects (Fig.16), different daily lives in the same building are shown in a section. In a way, it can be related to my personal visual experience when looking through the window. Confinement may make more evident the need not to only connect the outdoor, but also connect different indoor spaces.

For this reason, the dreamery the window can offer as an essential part of the positive light, in relation to both artificial light (outdoor) and daylight, should be considered. Everything that goes through, inside or outside of the window has a potential that can be exploited.

Positive light= standards+ visual comfort+ dreamery

6.- “Night of the Window”, by Federico García Lorca  
Original title: “Nocturnos De La Ventana”  
Traduced by Michael Holloway  
Holloway, M., Holloway, M. and profile, V., 2020. Night Of The Window - Nocturnos De La Ventana  
Reference 7.- (Lorca Translation).  
[online] Thehyperkarma.blogspot.com. Available at: <http://thehyperkarma.blogspot.com/2011/03/night-of-window-nocturnos-de-la-ventana.html> [Accessed 25 April 2020].

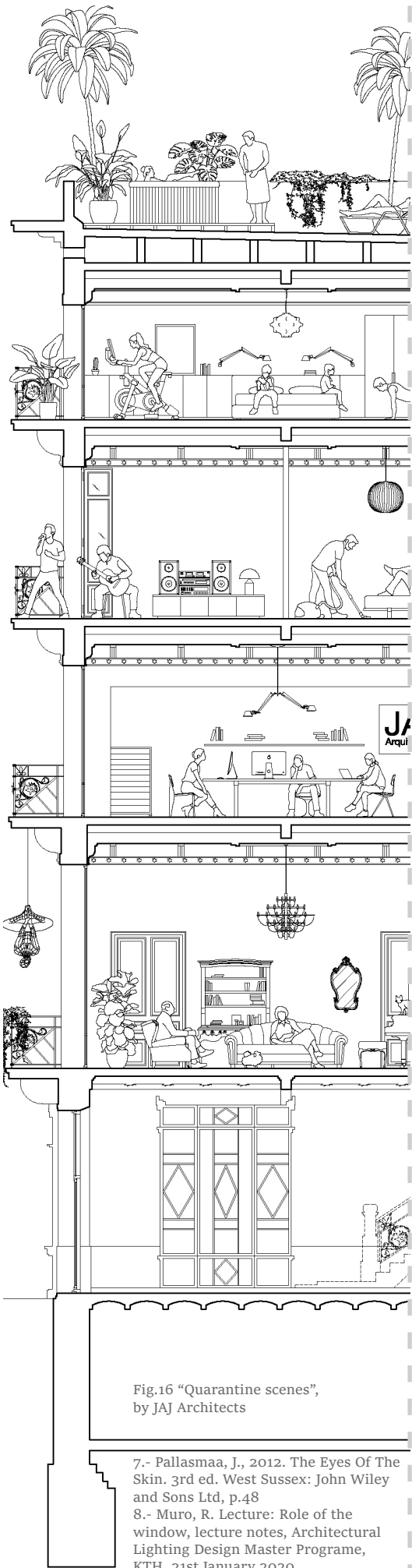


Fig.16 “Quarantine scenes”, by JAJ Architects

7.- Pallasmaa, J., 2012. The Eyes Of The Skin. 3rd ed. West Sussex: John Wiley and Sons Ltd, p.48  
8.- Muro, R. Lecture: Role of the window, lecture notes, Architectural Lighting Design Master Programe, KTH, 21st January 2020

5.- In search of positive light

5.1.- My window. Its value.

After analysing the pictures received, an experiment in relation to a window from my current domicile was undertaken. Following the different aspects of light throughout this project, I searched for my own positive light with available resources and tools. At this point, daylight conditions were analysed during the last week of April, as well as location, materials and other characteristics of the environment.

In response to the general survey, I feel most *active and productive* in the desk of my room. Indeed, there are some conditions that influence such an answer. My 60-80m2 apartment with a balcony, shared with two flatmates, is spacious enough. I have scored general brightness at 6/10 and the space shown, in Figure 17, has not changed due to quarantine. Nevertheless, the uses given have been fully conditioned due the incorporation of different uses in the household. My desk, within a room about 3x5 steps, is used for *working, eating, social interaction and leisure activities*.

My apartment, located in Rissne (Stockholm), is a newly built construction and has all types of amenities that make it comfortable, for instance, wide openings to South and North with good termical insulation. It is a private neighbourhood with access to common spaces and green areas.



Fig. 17



Fig. 18



Fig. 19



Fig. 20

Fig.17 In response to Q10 in the survey. My own desk.  
Figs. 18 and 19. Views in reference to the urban map.  
Fig.20. Urban map of my location, Rissneleden (lantmateriet.se)  
See the original image in Appendix Section III, pg. 40



It is well known that the weather in Stockholm is very unstable, so are its daylight conditions. Nevertheless, the closer to June, the more hours of daylight or even sunlight are received, due to its 60° latitude. (Ref.9)

The table 3 shows the trajectory of the Sun (Azimut) on 1st of May 2020; figure 21, the Sun path, during the same month, in comparison to the Summer and Winter Solstice.

Table 3 Sun Elevation and Azimut on the 1st May 2020

Time	Elevation	Azimut
5:00	0,42°	59,87°
6:00	7,41°	72,58°
7:00	14,91°	85,21°
8:00	22,54°	98,21°
9:00	29,92°	112,11°
10:00	36,55°	127,52°
11:00	41,84°	144,94°
12:00	45,12°	164,42°
13:00	45,84°	185,09°
14:00	43,84°	205,35°
15:00	39,51°	223,88°
16:00	33,5°	240,29°
17:00	26,46°	254,9°
18:00	18,92°	268,3°
19:00	11,33°	281,07°
20:00	4,07°	293,69°

9.- Hårleman, M., 2007. Daylight Influence On Colour Design Empirical Study On Perceived Colour And Colour Experience Indoors. 1st ed. Riga: Axl Books, p.17.

Figs. 22-25 Views in reference to the urban map (fig.21)

Fig. 21 Azimut in reference to Building D  
Original image in Appendix- Section III, pg. 41

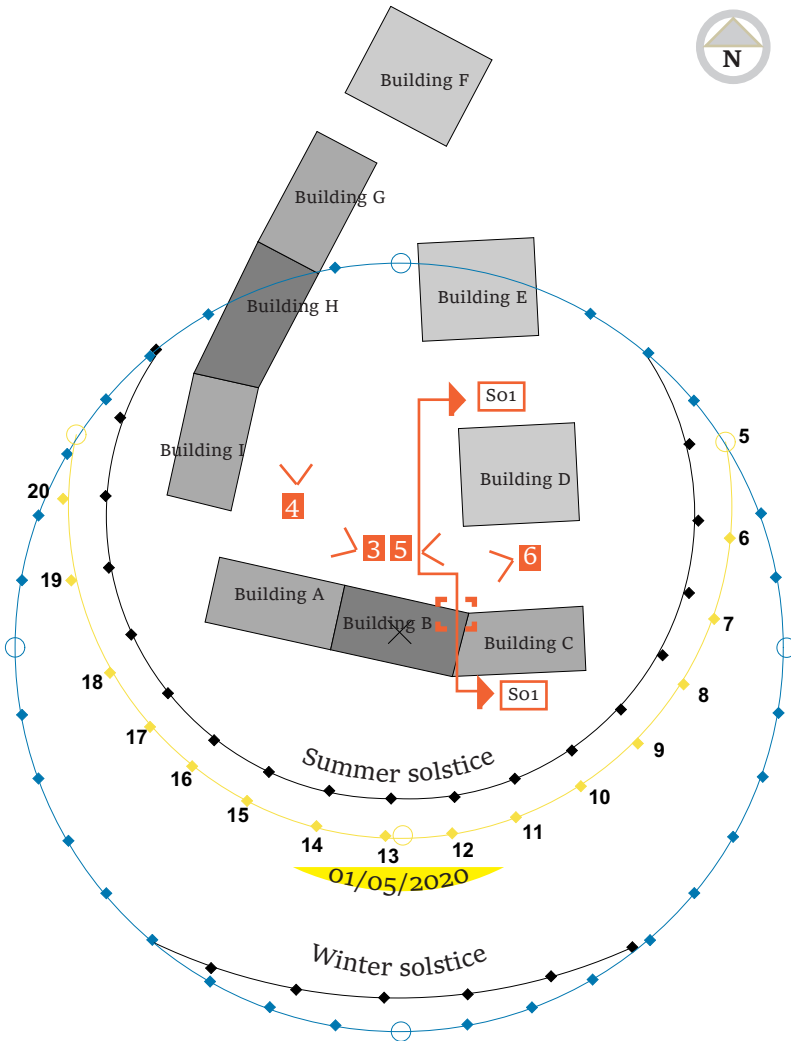


Fig. 22



Fig. 23



Fig. 24

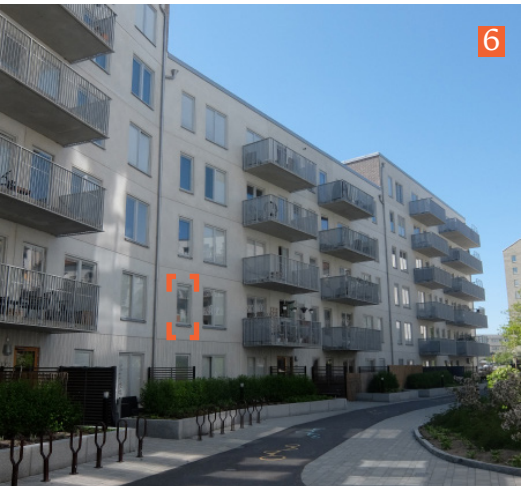


Fig. 25



Fig. 26 Window thickness



Fig. 27 Inner shutter

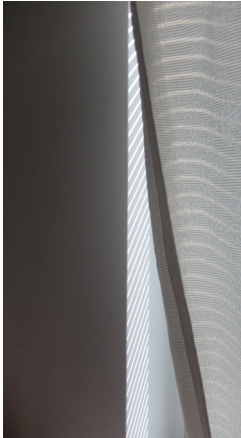


Fig. 28 Opaque curtains



Fig. 29 Views from my window

The room is facing a North facade, which deprives me of direct sunlight most of the time. It is lit by diffused light and indirect sunlight and lacks sharp shadows.

Furthermore, it is fully conditioned by the building in front (Figure 31). The materials surrounding the room are also enhanced by the facades of the neighbourhood. White colours are dominant, which is the main reason why, in addition to the respective lighting conditions of a North facade, light is generally perceived cold.

In terms of the relation to outdoors, the apartment is located on the second floor of the building. Building D does not block a more open view to green and common areas. Nevertheless, the distance between the window and this building is close enough to see inside other flats, and to be seen. In order to gain privacy, the window contains an inner shutter. White and opaque curtains are also available. The window is composed by three laminated glasses and another exterior one. In total, it has a thickness of 15 cm.

White walls, in contrast to wooden floors and views of vegetation, make an overall slightly warmer scene, fully conditioned by daylight. On one hand, light output is also enhanced by white furniture or steel coating from the bunk bed. On the other hand, other glossy materials from the corbel and the TV, understood as a dark rectangle in the wall, are potentially absorptive. So it is the grey colour from the storage surface.



Fig. 30 My window, in building B

## SECTION 01

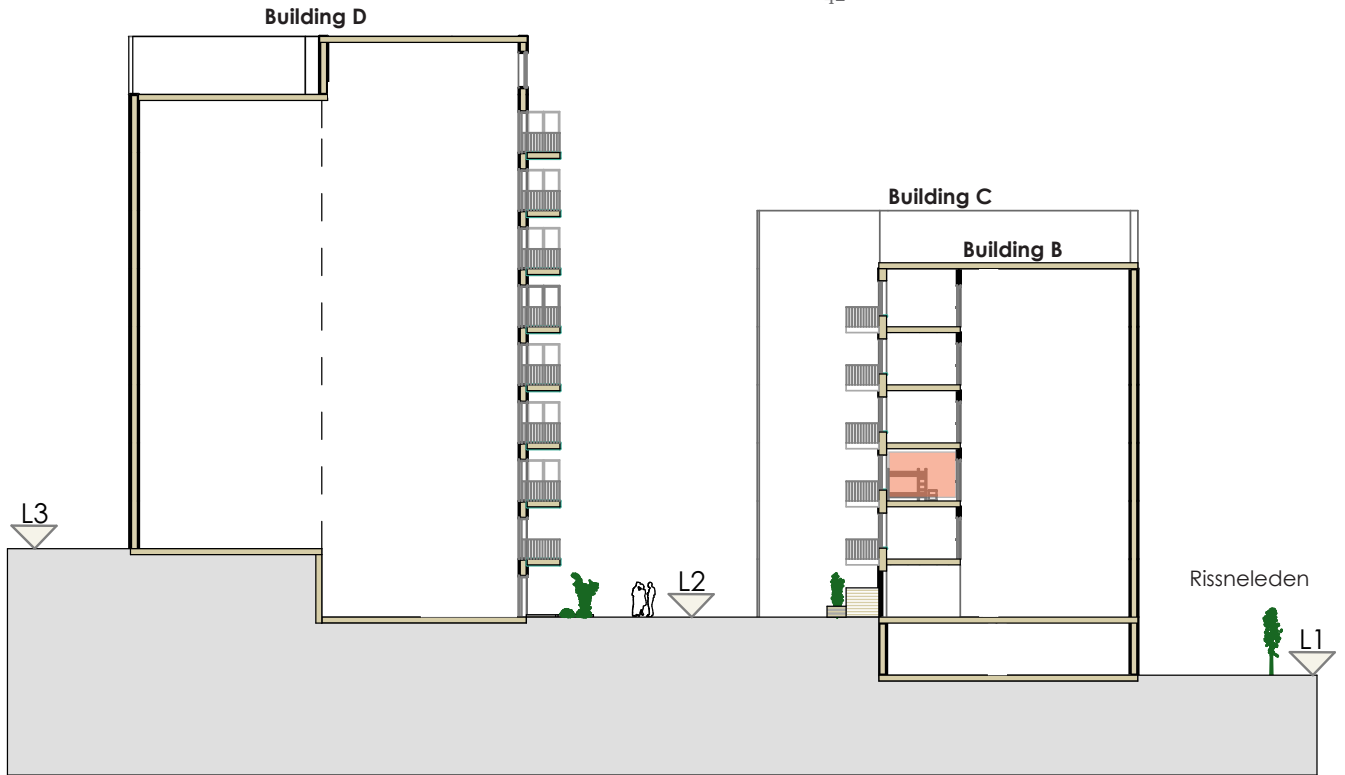


Fig. 31 Section 01. Sun path and elevation in reference to Building B and D. See in scale in Appendix- Section III, pg. 42



In terms of distribution, the desk is facing a wall, but still receives direct daylight from the window. This is a disposition that is suitable ergonomically. The jamb gives shadow to the table, which is enough to cover the screen and to avoid glare. On the other hand, it is not large enough to fully block views to common green areas.

Fig. 32 Floor  
Fig. 35 Stone corbel  
Fig. 33 Desk surface  
Fig. 36 Steel bunk bed  
Fig. 34 Shelve surface  
Fig. 37 TV surface

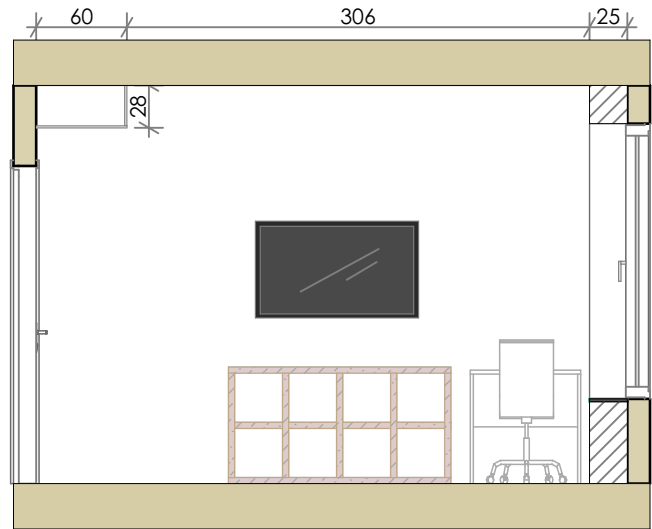


Fig. 39- S01. E:1/50

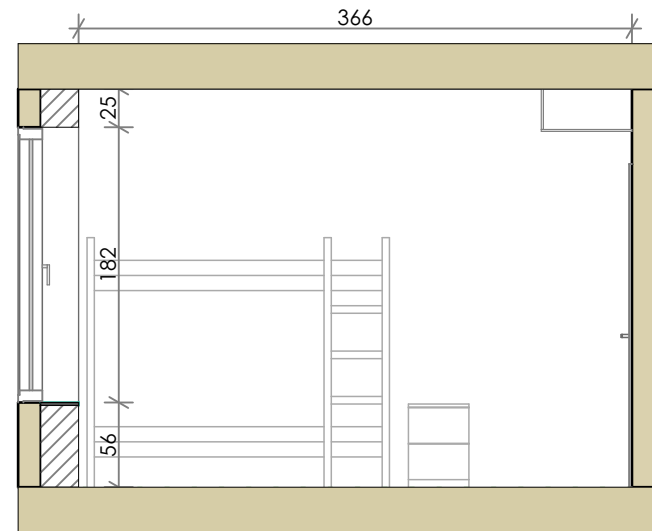


Fig. 41- S03. E:1/50

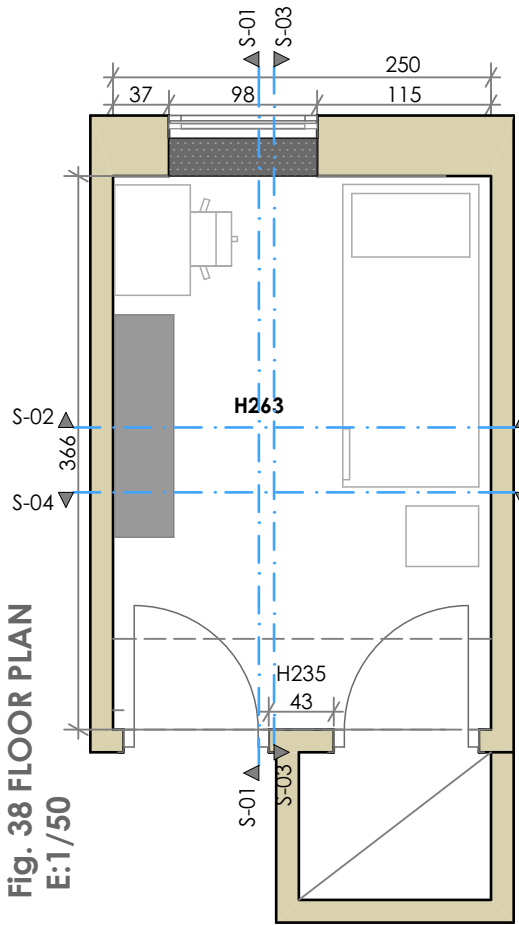


Fig. 38 FLOOR PLAN  
E:1/50

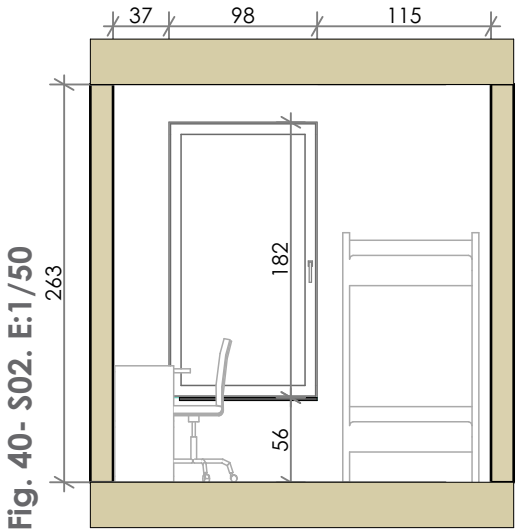


Fig. 40- S02. E:1/50

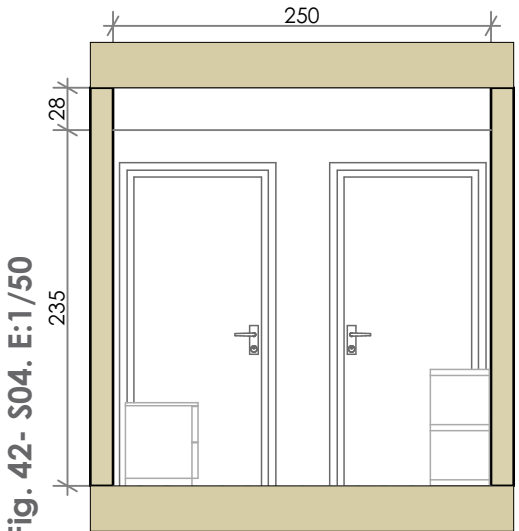


Fig. 42- S04. E:1/50

On first sight, one could say that the window seems big enough to have good lighting distribution in relation to the size of the room.

The lighting conditions were analysed in one week in sunny weather conditions. Under these conditions the following observations were made.

- Light is distributed homogenously along the day.
- There are no large obstacles that could handicap performing tasks.
- Reflected sunlight is received with different lighting qualities (named R1/R2/R3/R4/R5).
- Light is generally perceived as cold.
- Light is percieved more blueish during the afternoon( from 18 to 20), as a consequence of reflections of the sky from opposite windows, during blue hours.
- Better performance perception, due to lighting qualities, is executed during the first hours in the morning (R1 and R2).
- Views evoke personal imaginery.

Fig. 43 Group R1 reflection  
Fig. 44 Group R2 reflection  
Fig. 45 Group R3 reflection  
Fig. 46 Group R4 reflection  
Fig. 47 Group R5 reflection



**R1. From 9:45 to 10:20** Direct reflection from an upper window from the Building D (8th floor), in a diagonal direction. The reflection involves, mainly, the table surface and part of the wall behind the screen. It is partially hidden with my presence.

**R2. From 11:00 to 11:20** Direct reflection, with a straight direction, from another upper window (7th floor). A bigger shadow is generated in the screen area, while the spread of light is bigger on the floor.

**R3. From 18:00 to 19:00** Indirect reflection from the West facade. Light is percieved warmer. The reflections go straight to the end of the room. There are no other reflections around the desk.

**R4. From 19:00 to 19:20** Direct reflection from an upper window from Building H (6th floor). The direction faces the bed and generates the shadows of the structure. The spread is limited to a certain area of the wall.

**R5 Nighttime from 21:00** There is a perceptible amount of light coming from outdoor lighting. It projects the shape of the window in the ceiling, desk wall and between the bunk bed. Due to glass characteristics, shadows are multiplied.

Scheme 4. Three elements of positive light

Positive light	A.- Standards in use/ How light responds to the uses	
	B.- Visual comfort/ What do I perceive	
	C.- Dreamery/ What potential does it have	

Scheme 5. Lighting characteristics in a day analysis

Working/ studying		Eating		Social interaction/ Entertainment		Relaxing/ Sleeping
R1	R2			R3	R4	R5
9:00	11:20	13:00	14:00	17:00		22:00
A.- Good lighting distribution is provided. B.- Side illumination that is suitable for working. C. Lighting qualities and reflections could be expanded to the rest of the room.		A.- Good lighting distribution is provided. B.- Lower illuminance. C.- A feeling of a "break moment" would be suitable.		A.- Good lighting distribution is provided, warmer light. B.- Lower illuminance and cold light. C.- Warmer light would be suitable.		A.- Possibility to block undesired light. B.- Glare received from outdoor bolards. C.- Urban lighting could be taken into account for the general feeling of the room



5.2.- My window. Its playfulness.

This section is a demonstration on how can we achieve positive light, one of the main questions of this project. Having analysed lighting conditions, understood as everything that goes through a window, the next steps consist on searching for positive light in three moments of a journey.

Noticing the importance of visual comfort, as a conclusion from the general survey, the aim is to test with different materials that could enhance it. For that reason, R1 and R3 were chosen to be tested with reflections and colour respectively. These reflect two moments in which illuminance standards are covered in relation to the use of the space. Two lighting qualities that appear in clear sky conditions and bring more visual comfort, that can be reproduced or enhanced.

In addition, and in relation to the latest term associated with positive light (dreamery), I chose to work with the imagery nighttime brings to my window, in terms of views and outdoor lighting (R5).

5.2.1.- Visual comfort through reflections (R1)

The first direct sunlight (R1), from a window reflection, is projected at 9:50am. It is not constant, as it moves along different windows from 8th to 7th floor. It gives a directional reflection that can be perceived, mainly, in the surface of the table and the wall in front. This phenomena remains, for approximately 1'5h, until it changes towards a much more straight direction (R2). The main element that influence daylight output during those hours is the South facade of Building D.

The photos below show the main lighting quality R1 reproduces. Due to the wide variations in daylight such effect is likely to disappear.

Fig. 49 South facade Building D. See the elevation in scale in Appendix- Section III, pg.44



Fig. 48 Direction reflection in R1 and R2

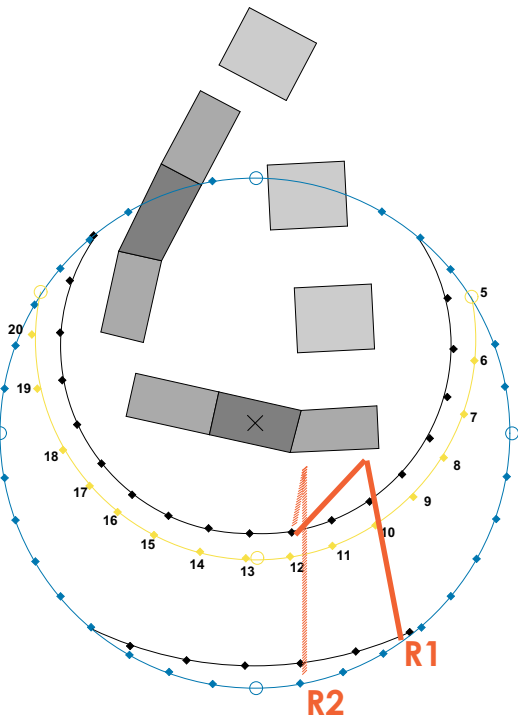


Fig. 50 R1 reflection with inner shutter

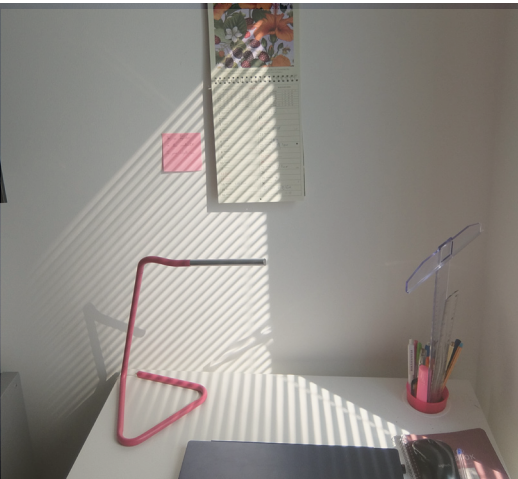


Fig. 23 R1 reflection with clear window



The willingness to keep visual comfort was therefore produced by testing with available materials at that moment. By doing so, on one hand, greater effects in clear skies are stimulated. On the other hand, original effects are evoked in overcast.

Scheme 6. R1 methodology

Visual comfort	Reflected sunlight: testing with reflective materials	Conclusions Dreamery
	Enhancing	
	Overcast: testing with reflective materials and filter	
	Evoquing	

Table 4. Illuminance measurements, in desk surface, on the 6th of May 2020

06/05/20	10:00	10:38	11:05	11:16	11:46
	575,9 lx	405,1 lx	895 lx	552,3 lx	447 lx
	Main use: working/ Corresponding standards: 500lux on desk surface/ R1 from 9.45 to 11:45 am				

Table 5. Initial pattern. Starting point.


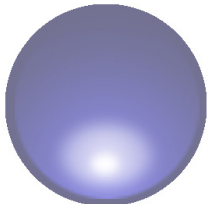
 Initial patern R1	Standards <div><div></div><div></div><div></div><div></div></div> Visual comfort <div><div></div><div></div><div></div><div></div></div> Dreamery <div><div></div><div></div><div></div><div></div></div>	 Clear sky Day. 07/05/20 Time. 9:52	<p>In Stockholm, lighting qualities, such as reflected sunlight, can be produced for a short period of time, specially in North facades. (Ref.9)</p> <p>I consider the possible glare as positive or not disturbing. Thus, it only affects my sight in a partial way, as my body becomes an obstacle for the window.</p> <p>It is fair to state that the disposition of the desk in relation to the window, contributes to good ergonomics.</p> <p>9.- Hårleman, M., 2007. Daylight Influence On Colour Design Empirical Study On Perceived Colour And Colour Experience Indoors. 1st ed. Riga: Axl Books, p.17.</p>

Table 6. Test 07/05



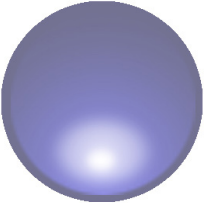
		<div>Standards</div> <div><div></div><div></div><div></div><div></div></div> <div>Visual comfort</div> <div><div></div><div></div><div></div><div></div></div> <div>Dreamery</div> <div><div></div><div></div><div></div><div></div></div>	<div></div> <div>Clear sky</div> <div>Day. 07/05/20</div> <div>Time. 10:03</div>	<p>The direction of the effects do not contribute to glare. Its direction faces the shape of the main reflection. This first step shows that reflections bring playfulness to the desk, as well as to the room.</p> <p>Nevertheless, in terms of visual comfort, it does not bring further effects that could be attributed to only perception.</p>	<div>Enhancing</div>
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Table 7. Test 09/05


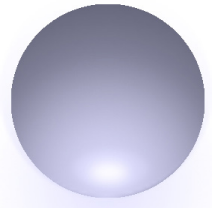
	Standards <div><div></div><div></div><div></div><div></div><div></div></div>	<p>The shape of the plastic itself creates shadows that give a sensation of direction. Such effect depends on the size and shape of the material. The objective is to reproduce the original Sun ray. However, with lower illuminance intensity, the material becomes less reflective. Further steps can be made with the simetry produced by the mirror effect.</p>
	Visual comfort <div><div></div><div></div><div></div><div></div><div></div></div>	
	Dreamery <div><div></div><div></div><div></div><div></div><div></div></div>	
	<div><div></div><div>Intermediate sky</div></div>	
Searching for further effects in lower illuminance levels. Material: plastic mirror effect		Day. 09/05/20
		Time. 10:09
		Evoquing

Table 8. Test 14/05 10:43


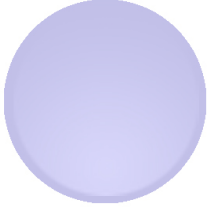

	Standards <div><div></div><div></div><div></div><div></div><div></div></div>	<p>Despite adding warmth, and the fact that my own body can block part of the effect, this application could negativley affect visual comfort. In the surface, would appear three diferent areas in terms of colour and lighting temperature.</p>
	Visual comfort <div><div></div><div></div><div></div><div></div><div></div></div>	
	Dreamery <div><div></div><div></div><div></div><div></div><div></div></div>	
	<div><div></div><div>Uniform sky</div></div>	
Evoquing original reflections at very low illuminance levels. Material: filter and metallic card		Day. 14/05/20
		Time. 10:43
		

Table 9. Test 14/05 11:27

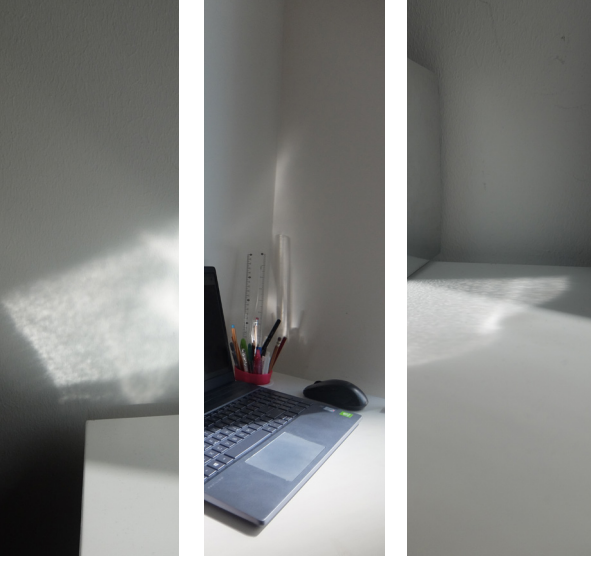
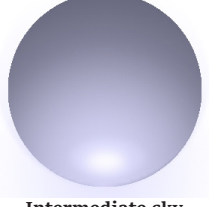
	Standards <div><div></div><div></div><div></div><div></div><div></div></div>	<p>This material allows better manipulation, control and a widen possibility of reflections. In this case, visual comfort depends on how both R1 intensity and the created reflections are controled. Therefore, they can not interfere with the laptop or generate much brighter surfaces that could contribute to glare. The idea of reproducing the original Sun ray is left behind, as this material brings a wide range of possibilities.</p>
	Visual comfort <div><div></div><div></div><div></div><div></div><div></div></div>	
	Dreamery <div><div></div><div></div><div></div><div></div><div></div></div>	
	<div><div></div><div>Intermediate sky</div></div>	
Evoquing original reflections. Material: metallic card		Day. 14/05/20
		Time. 11:27
		Enhancing

Fig. 52 Reflections with metallic card and filter



Table 10. Proposed shape

Proposed shape and treatment, with filter and metallic card

**Limitations:** Materials were tested, mainly, in a model (see Appendix- SectionIII, pg.44).

**Conclusions:** While filtered light contributes to visual comfort, reflections enhance Dreamery. Despite weather conditions, reflections tend to represent the idea of a sun ray. Consequently, by evoquing or reproducing sunlight effect, the relations made in our memory are purely subjective, something that corresponds to Dreamery. In terms of materials, the metallic card gives a wider variety of manipulation and results.

**Further steps:** The shape could be positioned on the shelfe or table side, depending on the skylight conditions, in order to have a better control of the effect. Meanwhile, in terms of visual comfort, mixing the material reflector with the filter is more suitable.



5.2.2.- Visual comfort through colour (R3)

The warmest light is perceived between 5 and 7pm. The use of the space shown is related to *Leisure acitvities* or *Social interaction*.

“Instead of trying to make the cool rooms warm it is possible to do just the opposite by employing colors that emphasize their cool atmosphere. Even when the sun is warmest and most brilliant, daylight in northern rooms will have a blue undertone because all light here is, after all, solely and exclusively reflection from the sky.” (Ref.10)

As an attempt to contribute once again to visual comfort, the suggestion is to paint the wall of the room that receives most of the reflected sunlight. Therefore, I use the model to prove this with a warm colour sample that, in contrast to the white inherent colour the room has, would produce a greater contrast. (Appendix- Section III, pg.47) I assume that, by stimulating peripheral vision, the perspective of the desk area, warmer light would be perceived.

Nevertheless, daylight also influences perception in colour. In order to better understand this, and for further steps, I consider some of the findings tested in this field. The PHD researcher, Maud Hårleman, has collected significant information about Scandinavian daylight, colour and orientation.

Table 11. Analysis and conclusions. Testing with colour

Limitations	
Colour is tested with available materials at the moment. The sample colour is digitally related to NCS Colour Atlas, in order to get a better aproximation to reality in hue and nuance. The code is S0505Y30R (yellow with 30%, 5% whiteness and 5% chromaticness). Perception is fully conditioned by the weather at this moment of the year (May). The selected colour is also based on my own cultural background, where colours in a yellow hue, trigger warmer visual sensations.	
Findings	Observations
“The concept of warm and cool colour appearance is more complex than was expected.It was concluded that they consisted of different aspects beside hue. The first aspect was the association with warm as opposed to cool phenomena, as fire and ice. In this respect blue was always cool and red was always warm. (...) The third aspect was blackness and chromaticness in combination. In the investigation I found a connection between “warm” and whiteness as opposed to “cool” and blackness. (...)”.	It is also observed that the floor material plays a big role in terms of perception (figs. 54 and 55).  11.- Hårleman, M., 2007. Daylight Influence On Colour Design Empirical Study On Perceived Colour And Colour Experience Indoors. 1st ed. Riga: Axl Books, p.78.
“The diffuse sky light in the north enhanced the chromaticness of green, blue and red hues. In this light all these shifted towards elementary blue. On the other hand, yellowish colours were reduced in yellowishness, becoming less coloured with a trace of greyishness and a tendency towards green or pink, depending on colour attribute of inherent colour”	Such differences can also be seen with the colour example tested in the model. (eg. figs. 58 and 59)  12.- Hårleman, M., 2007. Daylight Influence On Colour Design Empirical Study On Perceived Colour And Colour Experience Indoors. 1st ed. Riga: Axl Books, p.46.
“The investigation showed distinct and settled shifts in hue and nuance between the rooms depending on their compass orientation. In sunlight all colours changed to be more chromatic, warmer and more yellowish. Greenish blue and blue colours shifted towards green. In sky- light, the inherent pale yellow colour in most cases appeared”.	Reflected sunlight in clear sky conditions is the only factor that can bring a warmer feeling to the room (fig.55) 13.- Hårleman, M., 2007. Daylight Influence On Colour Design Empirical Study On Perceived Colour And Colour Experience Indoors. 1st ed. Riga: Axl Books, p.76-77.
Conclusions	
Considering characteristics of the location in relation to daylight, constant shifts in hue and nuance can cause different perceptions of the painted wall. Therefore, the desired warmer light perception can be fully conditioned by this phenomena. Despite measurements in the model, which show warmer light with a wall painted scenario, it is important to consider perception in all terms. In other words it is also advisable to consider colour perception.	



Fig. 53 Reflected sunlight from East facade (Building D)

10.- Hårleman, M., 2007. Daylight Influence On Colour Design Empirical Study On Perceived Colour And Colour Experience Indoors. 1st ed. Riga: Axl Books, p.14.



20/05/2020
Uniform sky
From left to right
17:45
188,2 lx 4918 K 567,8nm
18:00
21,1 lx 4796 K 568,4 nm
18:15
55,6 lx 5179 K 563 nm
18:30
50 lx 4950 K 566,8 nm
18:45
38,3 lx 5023 K 565,7 nm
19:00
44 lx 4971 K 566,5 nm

During the 20th May 2020, there was an overcast sky. The illuminance was measured from the centre of the room.



5.2.3.- Dreamery through urban lighting (R5)

Dreamery belongs to something more personal, as it is part of individuals imaginery. In this period of time of the journey, I rely on my own imagination. R5 is not related to any activity that requires specific standards. With this exercise other ways to analyse personal lighting conditions are shown.

The views have always been personally related to the sense of being in a doll's house. Especially at night, one can see different characters at the same space doing common activities. In a way, one is an actor of the scene, as well as a spectator. Such imaginary could be related to our human instinct of adaptation and resilience that, under a context of quarantine, is even more noticeable.

In relation to the mentioned value and playfulness of the window, urban lighting reflections are shaped through the window (see Appendix Section III, pg. 48). Such action implies two different results. On one hand, spyholes are created in order to observe, from an unstanding point, the desired specific areas of the neighbourhood (Fig.60). As a consequence, a different relation between indoor-outdoor is created.

On the other hand, the room receives projections from shaped, filtered and blocked light. Thanks to the characteristics of the glass, a superposition of squared shadows and light are created (Figs.62-65). As a consequence, a sense of windows is reproduced indoor, as an extension of the idea of a doll's house.

Fig. 60

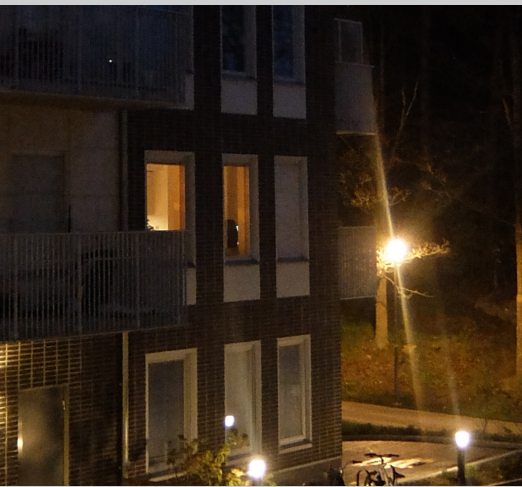
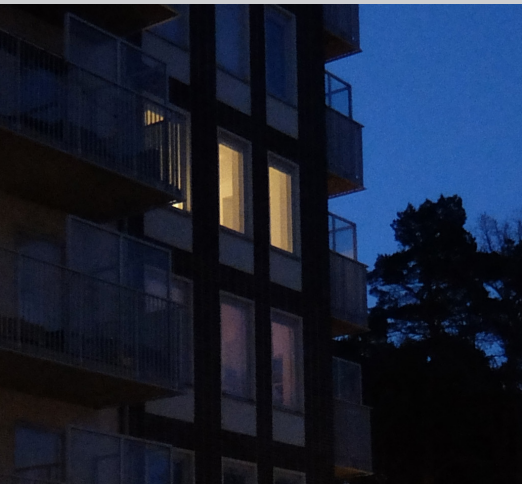


Fig. 61

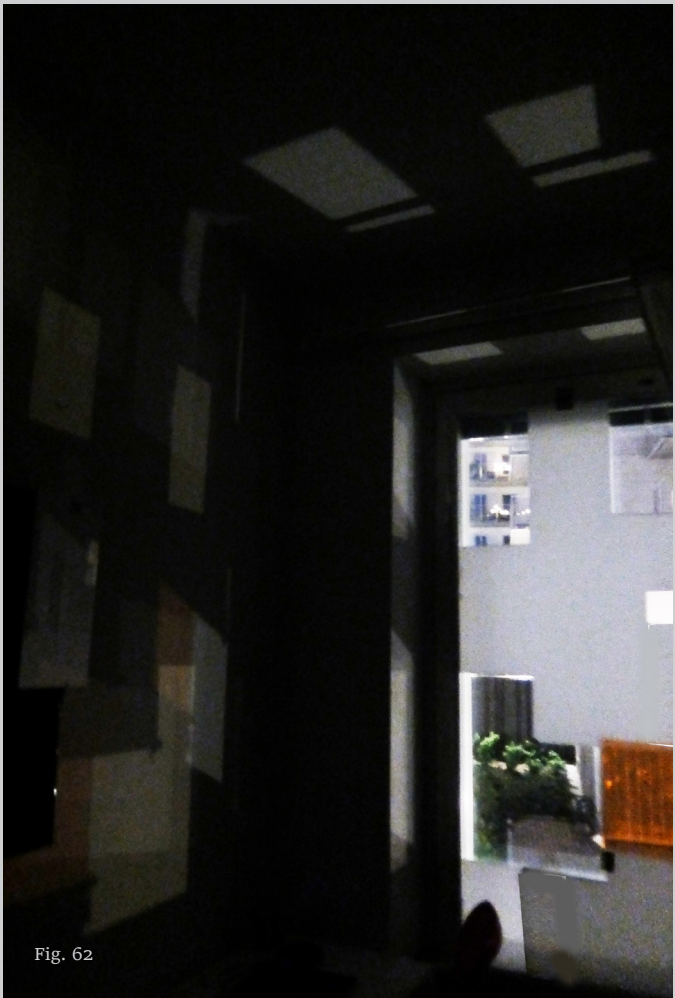


Fig. 62



Fig. 63



Fig. 64



Materials, such as orange filter, white cardboard or glass samples were used to enhance lighting qualities.

Fig. 65



# 6.- Conclusions

*Positive light* can be better perceived as a result of a combination of any of its three elements: standards, visual comfort and dreamery.

The last two mentioned are much more appealing in a context of confinement. Both of them, can be sustained to a personal choice, in comparison to standards. Furthermore, dreamery allows the user to connect images from their memories, something that can bring further positive emotions.

The window, is the architectural element of the house that can bring the three characteristics together. In such context, it is not only a hole in a wall that allows ventilation, but a way of communication with outdoors. Therefore, flexibility is implied in relation to the amount of possibilities it has in relation to compass orientation, location and materials. Furthermore, it is important to consider all the light sources that bring light through the window.

Being located in a North Facade in Stockholm, visual comfort is mostly demanded by the need of warmer light. Having the opportunity to get sunlight reflections, it is important to contribute to a dynamic feeling along the journey with different materials. With the addition of colour, it is remarkable to analyse and understand how daylight is influenced or makes an influence in the room.

Such personal positive light is linked to the period of two months, in which sunlight is commonly perceived, in comparison to other seasons in Stockholm. Therefore, it would be interesting to test positivity in artificial light, in periods of less amount of daylight hours.

By using available materials at the moment I wanted to highlight the importance of exploiting available resources. Thinking about future ways of living in the house and the new uses that may remain in it, there is an evident need to rethink access to daylight. As Lighting Designers, Interior Designers or Architects, it is our responsibility to study the potential of our houses, regardless of their greater or worse connection to daylight, rather than thinking about the house of the future. By doing so, I believe we will contribute to the desired flexibility. Overall, we have the duty to occupy the existing houses and give them further lives, instead of building new ones that just a small portion of population would be able to afford.

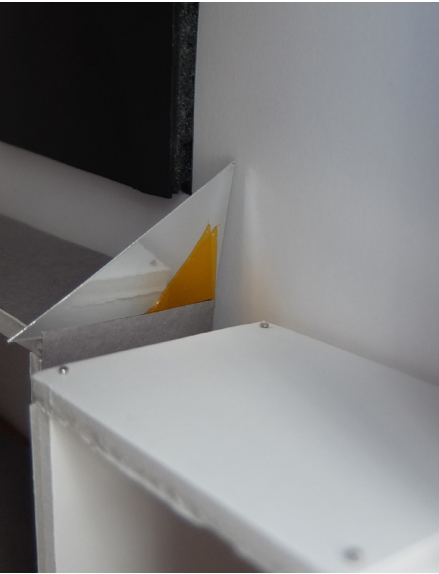


Fig. 58

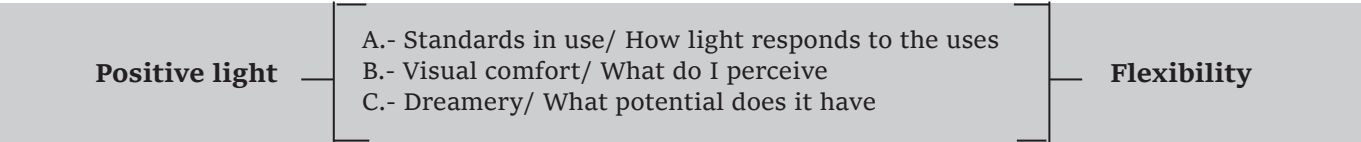


Fig. 58



Fig. 62

Scheme 7. Three elements of positive light and flexibility generation





# 7.- Biliography

Online resources:

Nats-informatik.uni-hamburg.de. 2020. [online] Available at: <<https://nats-www.informatik.uni-hamburg.de/pub/User/InterculturalCommunication/top2.pdf>> [Accessed 15 April 2020].

Suárez, M., 2020. Por Qué Los Españoles Somos Los Únicos Europeos Obsesionados Con Las Persianas. [online] EL PAÍS. Available at: <[https://elpais.com/elpais/2018/04/06/icon/1523015770\\_991742.html](https://elpais.com/elpais/2018/04/06/icon/1523015770_991742.html)> [Accessed 25 April 2020].

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Andrewmarsh.com. 2020. Software Development. [online] Available at: <<http://andrewmarsh.com/software/>> [Accessed 20 May 2020].

Image references:

Fig.20 Lantmateriet.se. 2020. Lantmateriet – Vi Känner Till Varenda Plats I Sverige.. [online] Available at: <<http://www.lantmateriet.se/>> [Accessed 2 May 2020]. (open source)

Fig.21 Sunearthtool.com. 2020. Sunearthtool.Com. [online] Available at: <<http://sunearthtool.com/>> [Accessed 1 May 2020]. (open source)

Fig.1 and Fig. 16 were granted by the authors.

All subjects who participated in the survey signed acceptance of Copyright.  
The rest of the pictures are the property of Gemma Alcalá.

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Pallasmaa, J., 2012. The Eyes Of The Skin. 3rd ed. West Sussex: John Wiley and Sons Ltd.

Fuertes, P. and Monteys, X., 2014. Casa Collage. Barcelona: G. Gili.

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8.- Appendix
8.1.- Section I

3.1.- Structure and analysis
Proposed survey: https://forms.gle/imBTExaeoJYfPqnn6

Introduction
Verònica Luna suggested to have an introduction from an emotional approach to obtain engagement

Copyright suggestions made by Elisenda Fontarnau

Copyright model
Suggested by Elisenda. In case the pictures are published out of the MT in a future (eg. exposition)

Question 1
Hi! Thank you for agreeing to do this survey. Your answers will be very valuable. First, I would like to ask you some general questions. City and country where you live:

Question 2
Your age. Choose between the options: Under 18/ 18-25/ 26-35/ 36-45/ 46-55/ 56-65/ Over 65

Question 3
Do you live in...? Choose between the options: A house with garden/ An appartment with balcony/ A house without garden/ An appartment without balcony

Question 4
How big is your house? -25 m2/ 25-40m2/ 40-60m2/ 60-80m2/ 80-100m2/+100 m2

Question 5
How bright is your home?
Very dark [circles] Very bright

Question 6
Who are you living with? Choose your household typology at the moment. Family/ Couple/ Single/ Flatmates/ Other

Question 7
Subject conditions before quarantine.
Has your household changed due to quarantine? (eg. "I am currently living at my grandmother's house because I moved to spend quarantine together") YES/NO

Question 8
Are you currently working/ studying at home? YES/NO

Question 9
Subject conditions before quarantine.
How much time did you use to spend at home before quarantine? If you consider it, feel free to choose MORE than one option.
- I used to work from home.
- I hardly ever was at home, due to work.
- I hardly ever was at home, due to work and social life.
- I was used to be at home most of the time.
- I was used to be at home most of the time, due to family conciliation.
- I used to spend most of the time at home afterwork.
- I used to spend most the of time at home during the weekends.
- Other

Question 10
Evoquing positive feelings by using adjectives that work according to cicardian ryhtms.
Take your time. You are now going to send good vibes to a stranger! Take a picture of a "positive" space of your house. If it is taken during DAYTI-ME, please show the space/corner/room where you can feel ACTIVE AND PRODUCTIVE. On the contrary, if it is taken at NIGHTTIME, please show the space/corner/room where you mostly feel CALM and SHELTERED. Take a picture of the side with no filters or extra effects. Do not show people in it, otherwise, the photograph will be dismissed.

Question 11
Please, indicate at what time did you take the picture.

Question 12
How big would you say the room/ corner/ space shown is? Measure it by steps (eg. 5x8)

Question 13
Describe your picture in three words:

Question 14
Did you change the space shown in the picture due to new needs? For instance, by modifying distribution or adding luminaires. YES/NO

Question 15
In case you have modified the room/ corner/ space, what has changed?

Question 16
Questions 14-16 are based on flexibility.
What type of activities are taking place now in the space shown? If you consider it, feel free to choose MORE than one option.
- Eating
- Cooking
- Working/ Studying
- Homeschooling
- Leisure activities (gameboards, playing an instrument, reading, drawing, sweing, etc)
- Physical activity
- Social interaction with family members or friends inside or outside the household
- Sleeping
- Self care practices
- Other

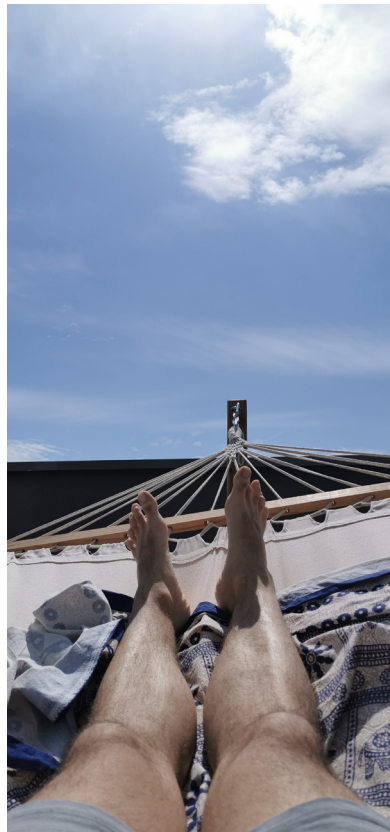




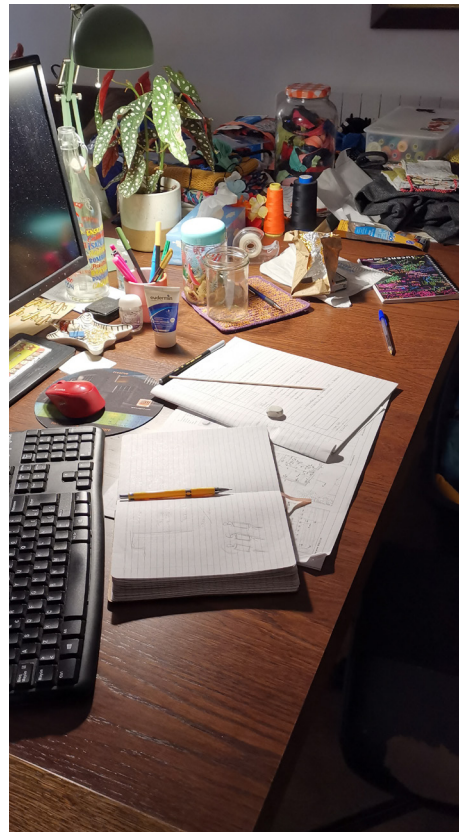
Picture 1: "Green, spacious, cold"



Picture 2: "Rekax, pure, nature" Fig. 7



Picture 3: "Relax, sunny, place"



Picture 4: "Hobby, work desk, production"



Picture 5: "Light. birds, life" Fig. 11



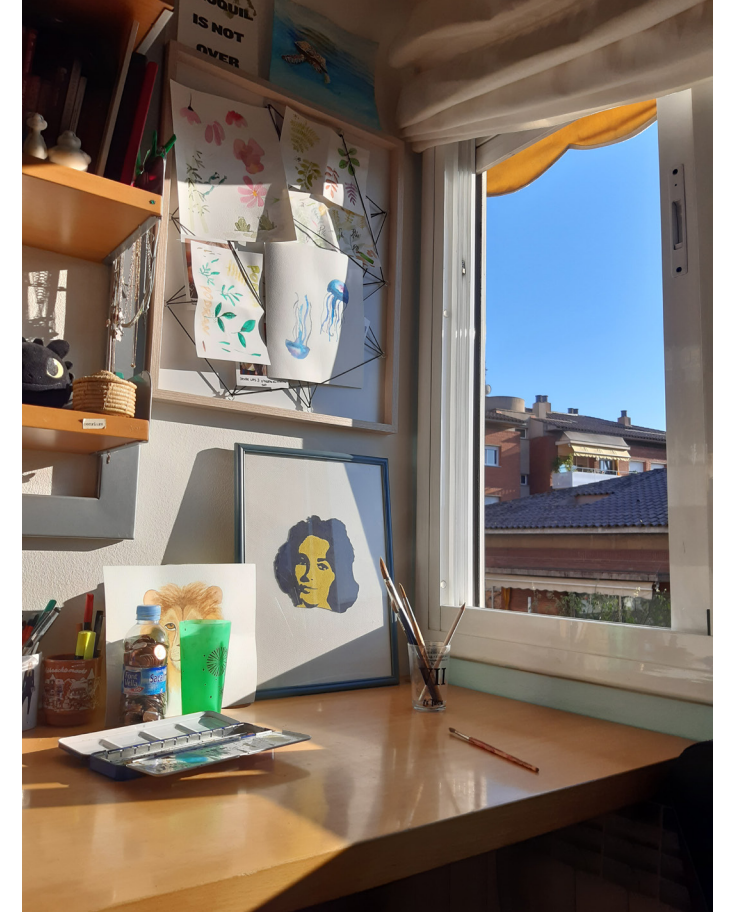
Picture 6: "Cozy, cheery, light" Fig. 2



Picture 7: "Relax, home, loneliness"



Picture 8: "Light, outdoor, nature" Fig. 6



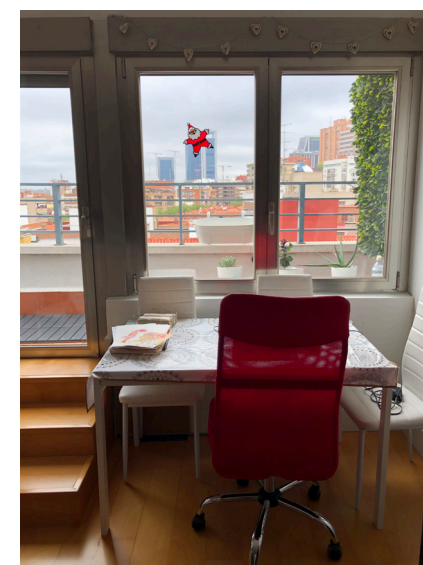
Picture 9: "Light, freedom, privacy" Fig. 9



Picture 10: "Rest, calm, family"



Picture 11: "Big, clear, spacious" Fig. 4



Picture 12: "Wide, alive" Fig. 8



Picture 13: "Personal, fresh, relax" Fig. 5



Picture 14: "Sunday, morning, relax" Fig. 3





Picture 15: "Bright, calm, good vibes"



Picture 16: "Shelter, calm, reflection"



Picture 17: "Calm, peace, self-knowledge" In reference to Fig. 10



Picture 18: "Quiet, calm, light" Fig. 13



Picture 19: "Cozy, calm, peace, family"



Picture 20: "Relax, calm, creativity" Fig. 12

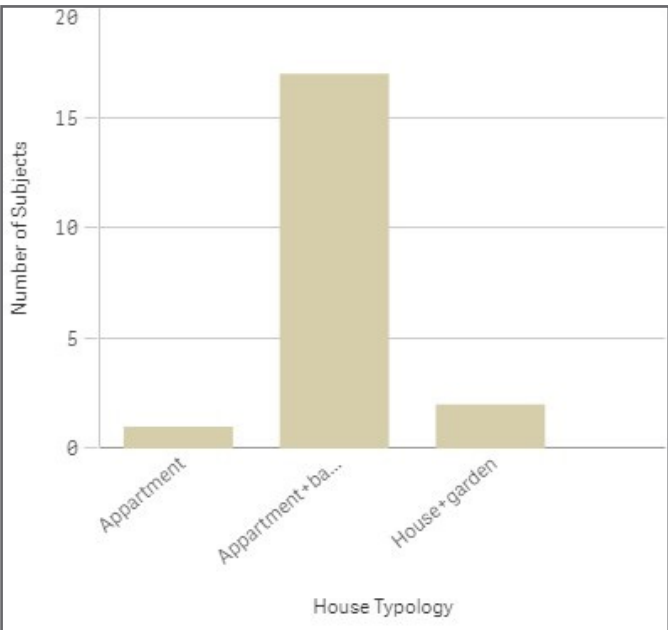


Picture 21/ Fig. 17

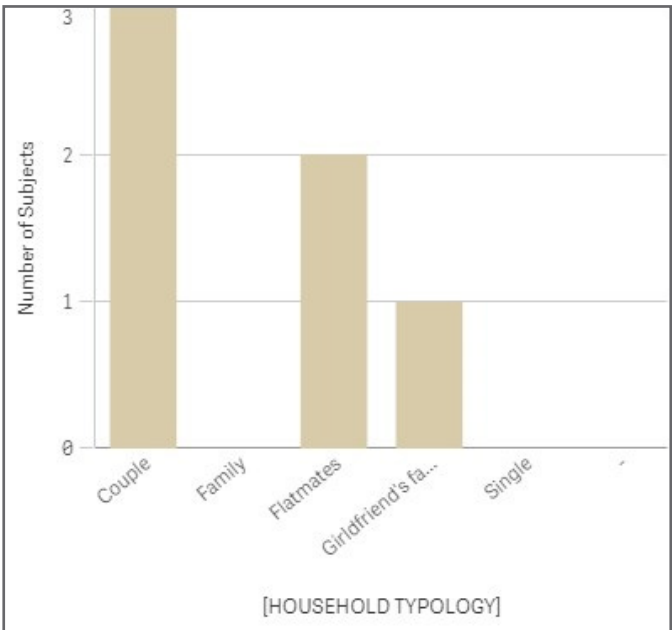


8.2.- Section II

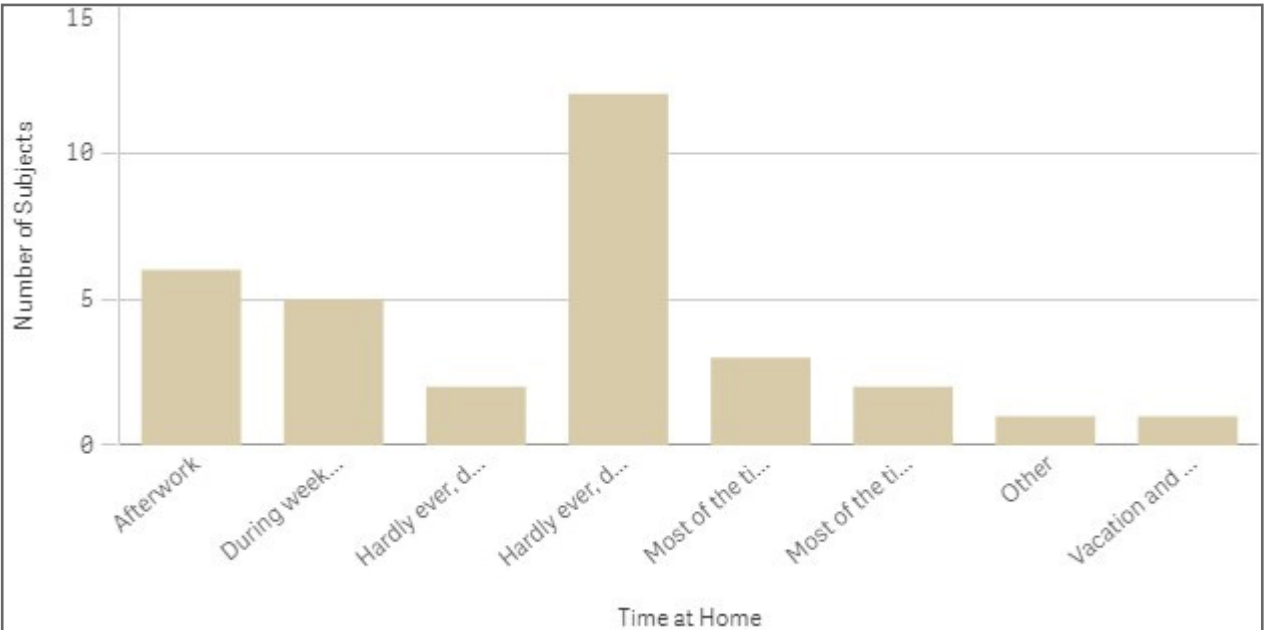
3.1.- Structure and analysis



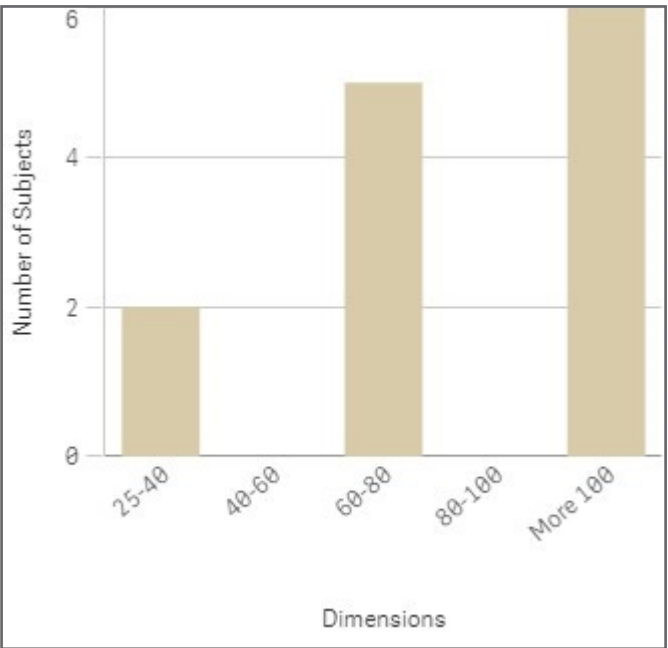
Picture 22.- Graph in relation to Q3



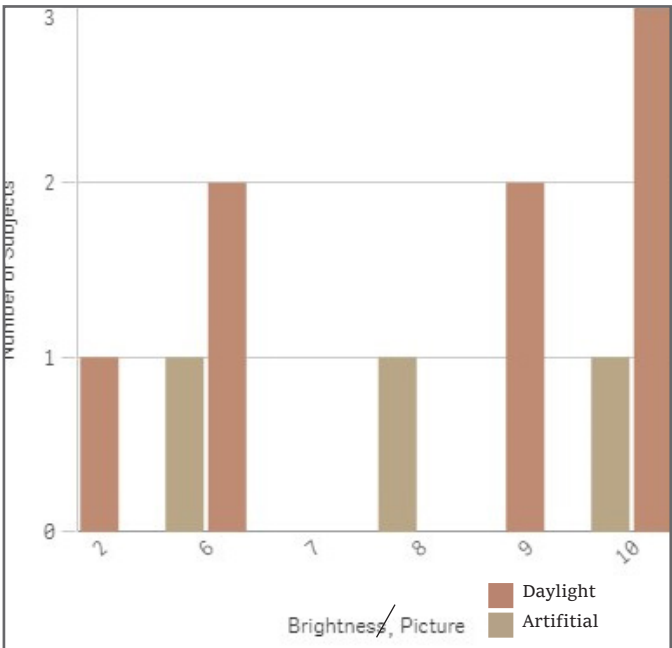
Picture 23.- Graph in relation to Q6



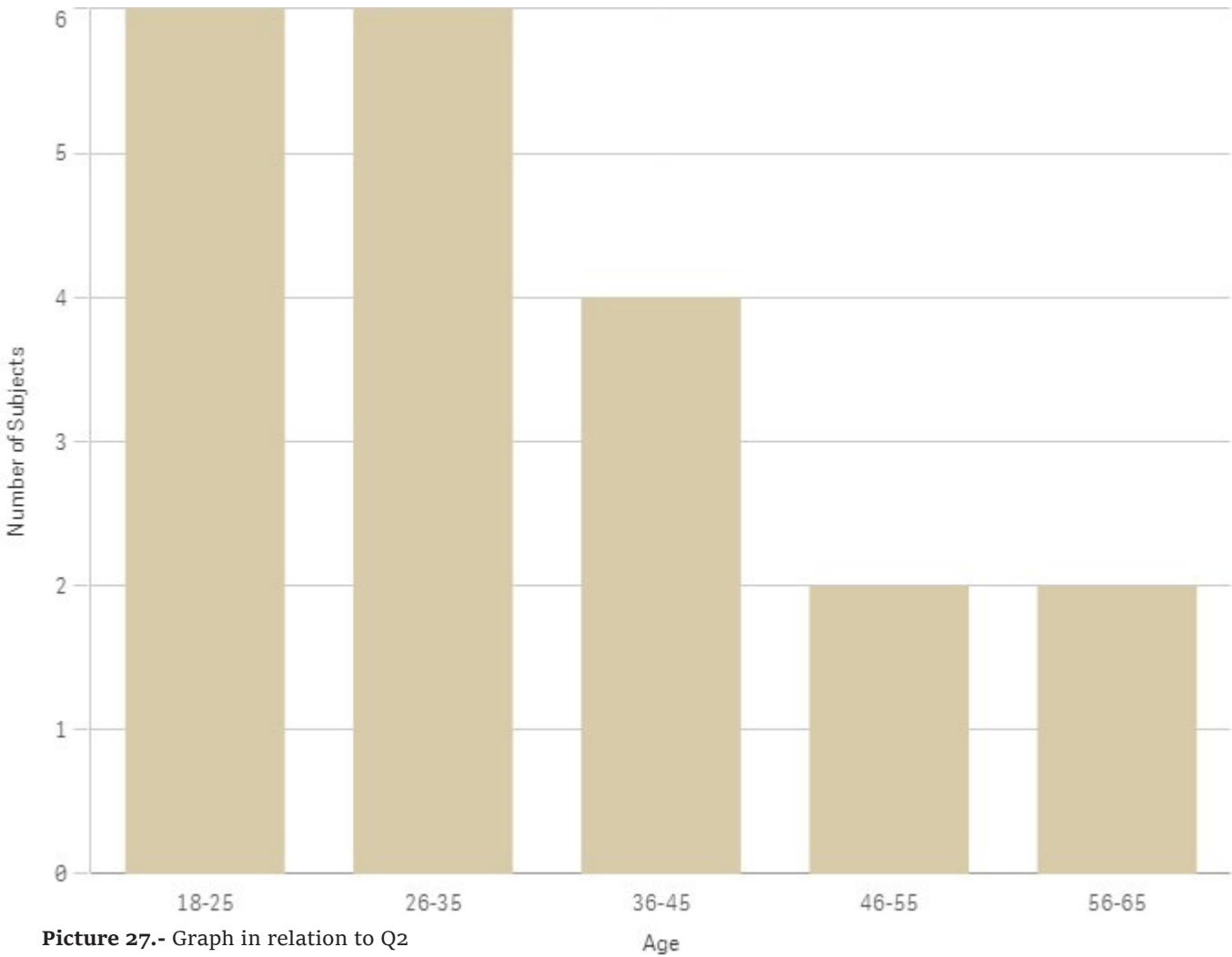
Picture 26.- Graph in relation to Q9



Picture 24.- Graph in relation to Q12



Picture 25.- Graph in relation to Q5

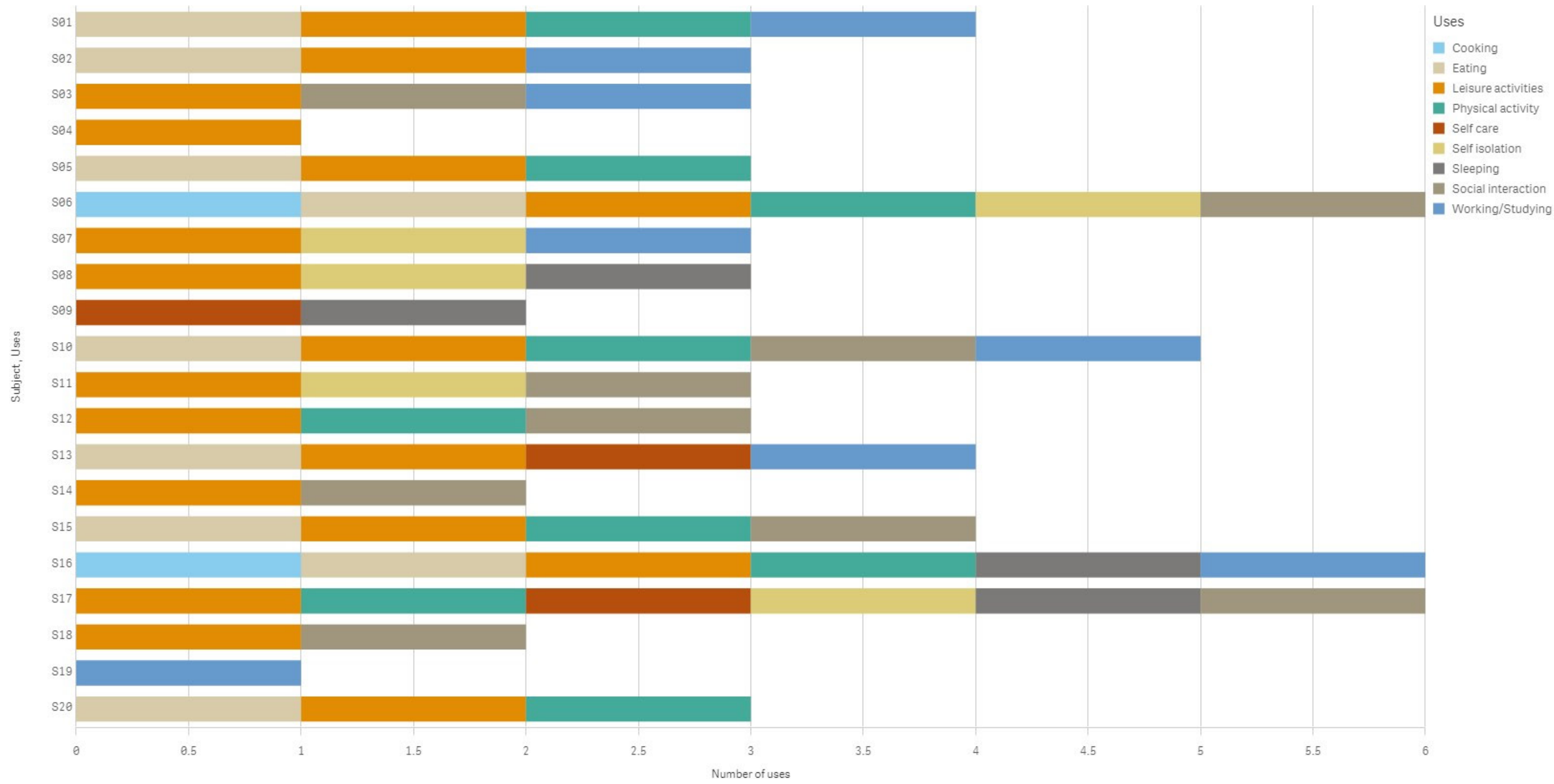


Picture 27.- Graph in relation to Q2



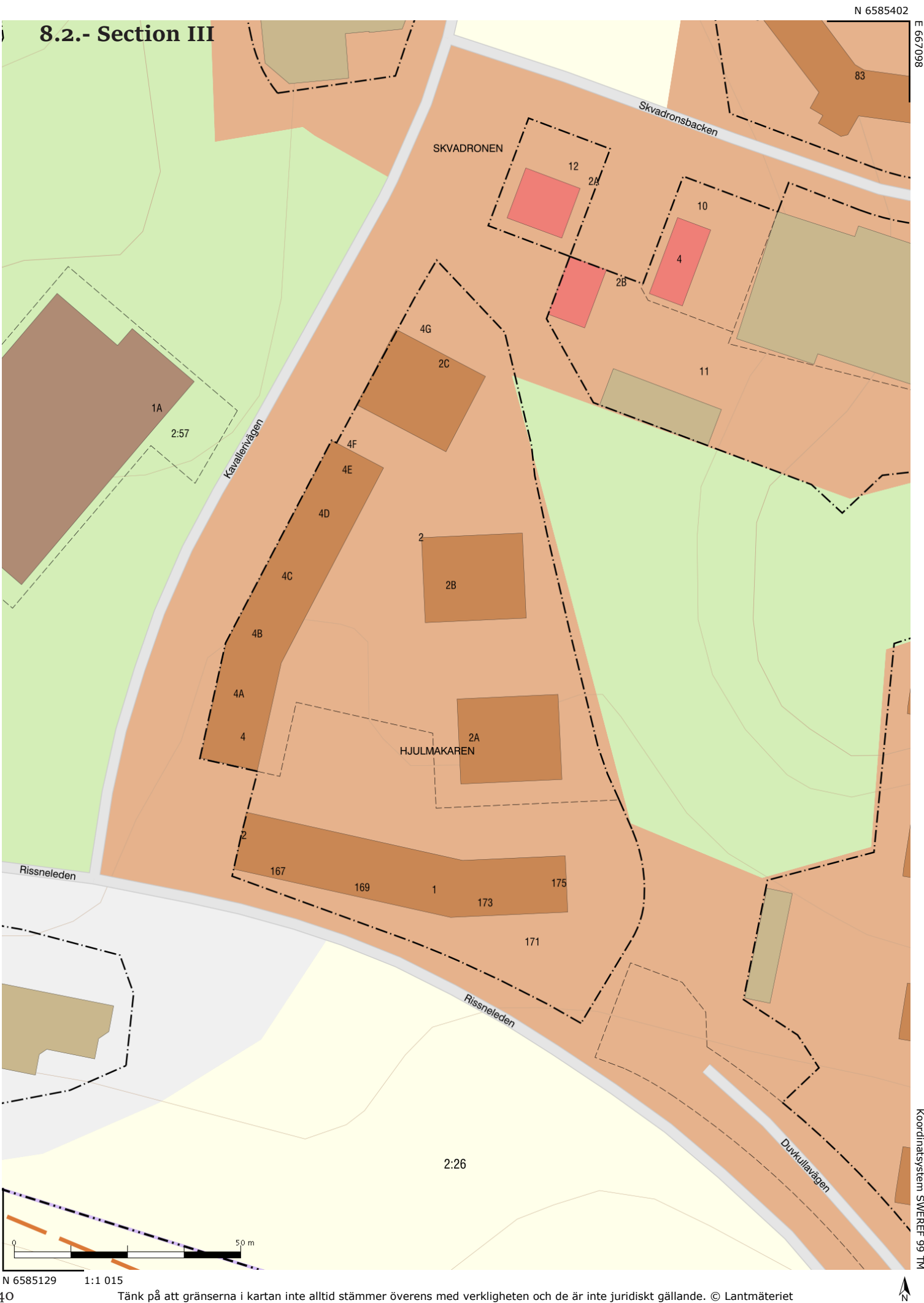
8.2.- Section II

3.1.- Structure and analysis



Picture 28.- Graph in relation to Q6



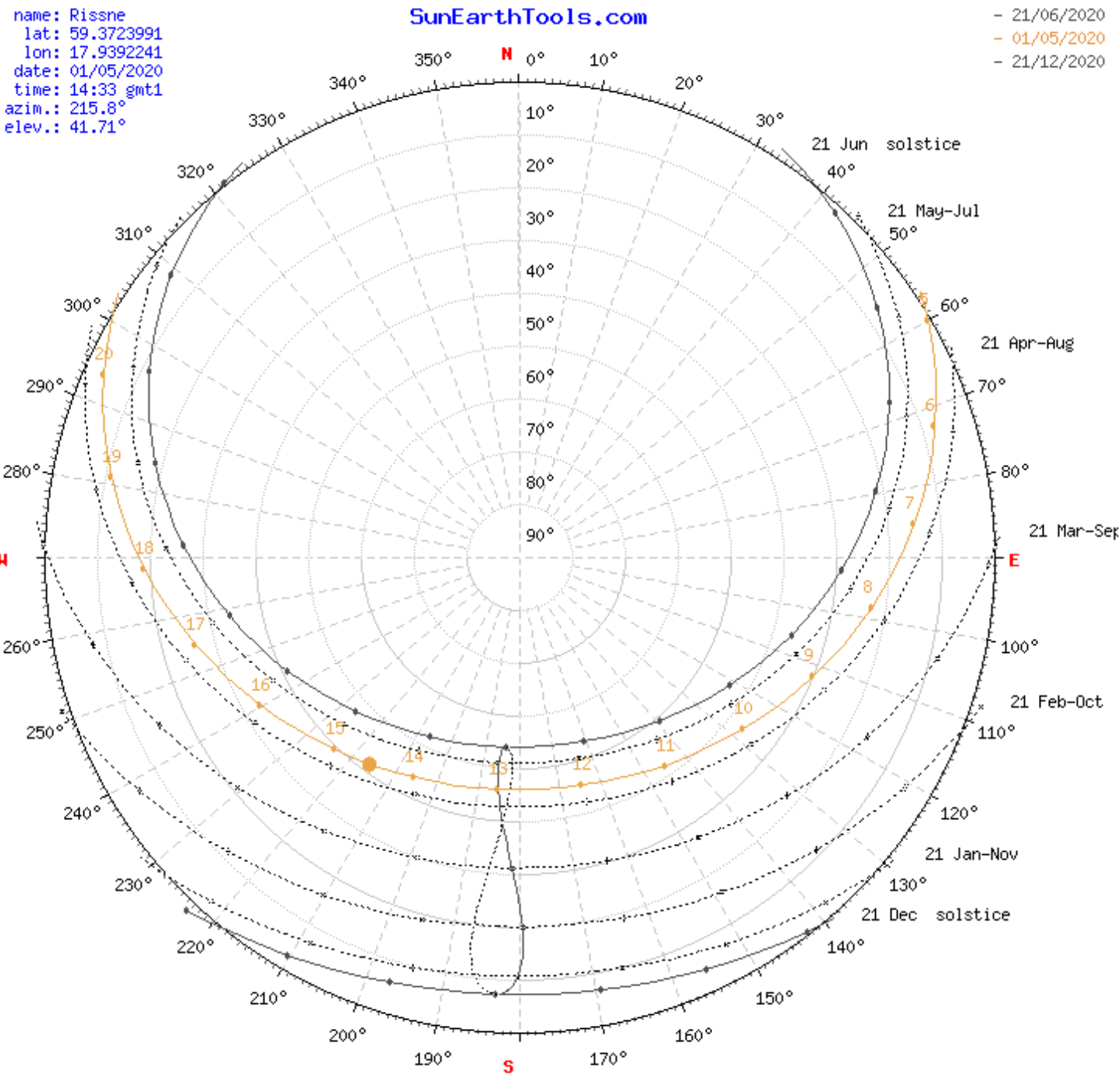


## 8.2.- Section III

### 5.1.- My window. Its value.

(left) **Picture 29.-** Original urban plan (lantmateriet.se) In reference to Fig. 20

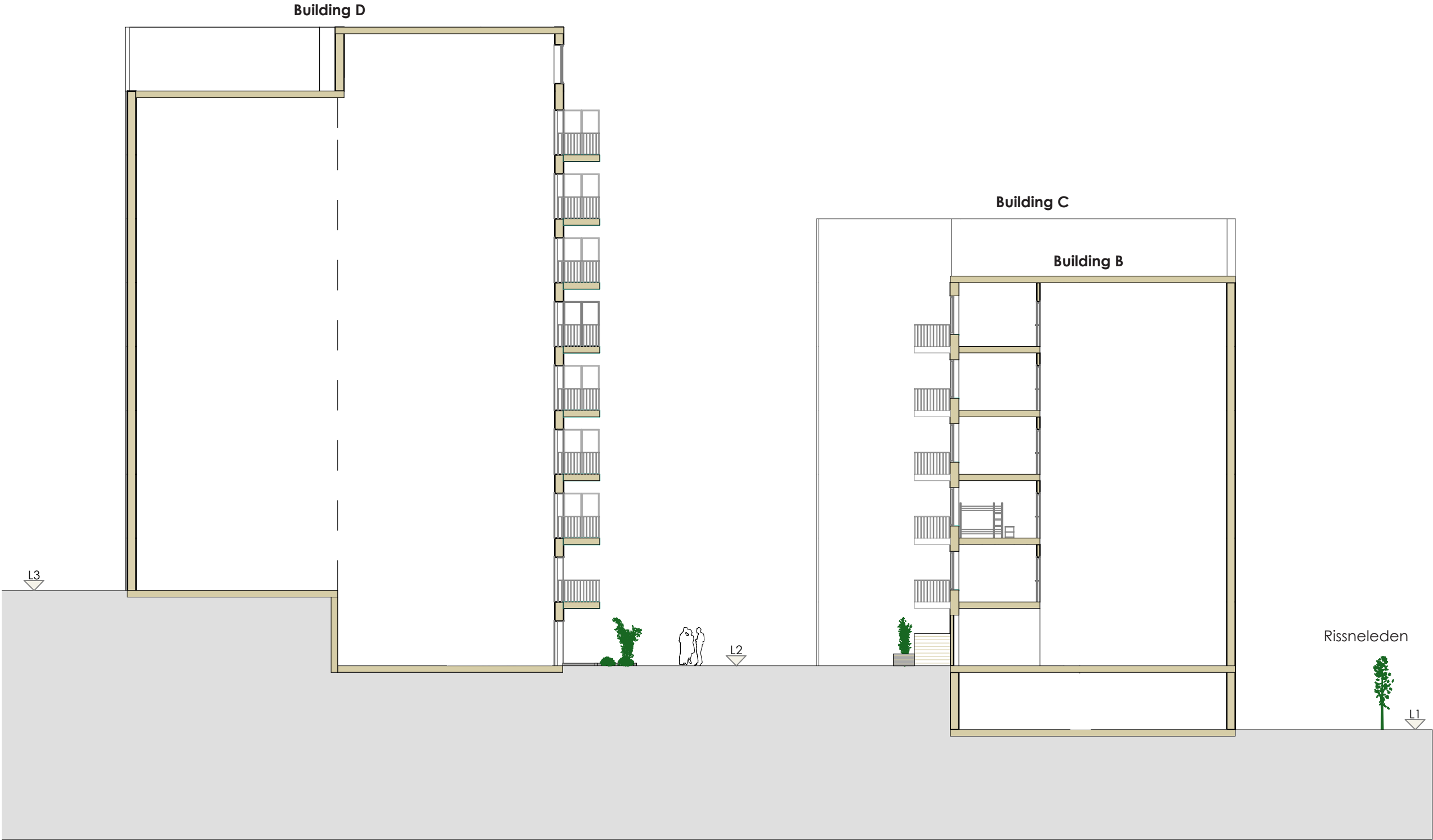
**Picture 30.-** Original Azimut graph (sunearthtool.com) In reference to Fig. 21





5.2.- My window. Its playfullnes

Picture 31.- Section 01. E1/200 In reference to Fig. 31





8.2.- Section III

5.2.- My window. Its playfullnes

Picture 32.- South facade elevation Building D. E1/200 In reference to Fig. 49



Picture 33.- Room model, E:1/10



Picture 33



Table 5. Initial patern R1

Standards
Visual comfort
Dreamery
Clear sky
Day. 07/05/20
Time. 9:52

In Stockholm, lighting qualities, such as reflected sunlight, can be produced for a short period of time, specially in North facades. (Ref.9) I consider the possible glare as positive or not disturbing. Thus, it only affects my sight in a partial way, as my body becomes an obstacle for the window. It is fair to state that the disposition of the desk in relation to the window, contributes to good ergonomics.

9.- Hårleman, M., 2007. Daylight Influence On Colour Design Empirical Study On Perceived Colour And Colour Experience Indoors. 1st ed. Riga: Axl Books, p.17.

Picture 34

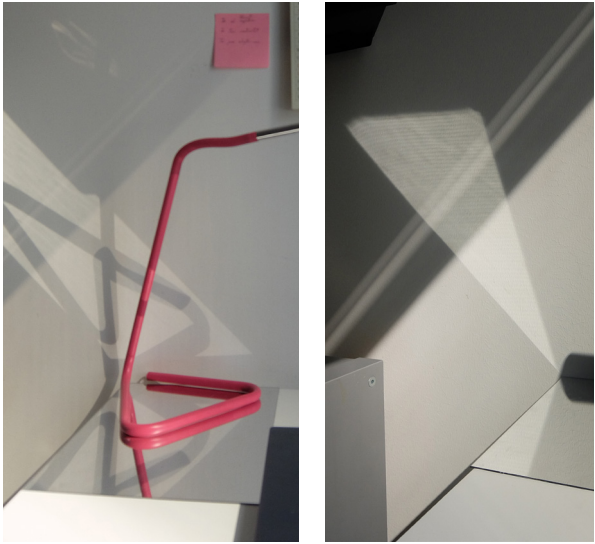


Table 6. Searching for further effects in lower illuminance levels. Material: plastic mirror effect

Standards
Visual comfort
Dreamery
Clear sky
Day. 07/05/20
Time. 10:03

The direction of the effects do not contribute to glare. Its direction faces the shape of the main reflection. This first step shows that reflections bring playfulness to the desk, as well as to the room. Nevertheless, in terms of visual comfort, it does not bring further effects that could be attributed to only perception.

Enhancing

Picture 35




Table 7. Searching for further effects in lower illuminance levels. Material:

Standards
Visual comfort
Dreamery
Intermediate sky
Day. 09/05/20
Time. 10:09

The shape of the plastic itself creates shadows that give a sensation of direction. Such effect depends on the size and shape of the material. The objective is to reproduce the original Sun ray. However, with lower illuminance intensity, the material becomes less reflective. Further steps can be made with the simetry produced by the mirror effect.

Evoquing





Standards

Visual comfort


Dreamery

Overcast sky

Day. 12/05/20

Time. 11:39

The effect aluminium has in the model is not the desired one in real scale. While in the model texture is appreciated, in the wall there are little reflections, due to a level of absorption. Glare is much more difficult to control, as well as the direction of reflected light.



Standards

Visual comfort


Dreamery

Uniform sky

Day. 13/05/20

Time. 11:09

This material allows better manipulation, control and a wider possibility of reflections. In this case, visual comfort depends on how both R1 intensity and the created reflections are controlled. Therefore, they can not interfere with the laptop or generate much brighter surfaces that could contribute to glare.



Standards

Visual comfort


Dreamery


Uniform sky

Day. 14/05/20

Time. 10:43

Despite adding warmth, and the fact that my own body can block part of the effect, this application could negativley affect visual comfort. In the surface, would appear three diferent areas in terms of colour and lighting temperature.





Standards

Visual comfort

Dreamery


Intermediate sky

Day. 14/05/20

Time. 11:27

This material allows better manipulation, control and a wider possibility of reflections. In this case, visual comfort depends on how both R1 intensity and the created reflections are controlled. Therefore, they can not interfere with the laptop or generate much brighter surfaces that could contribute to glare. The idea of reproducing the original Sun ray is left behind, as this material brings a wide range of possibilities.

Enhancing




**Limitations:** Materials were tested, mainly, in a model (see Appendix- SectionIII, pg.44)

**Conclusions:** While filtered light contributes to visual comfort, reflections enhance Dreamery. Despite weather conditions, reflections tend to represent the idea of a sun ray. Consequently, by evoquing or reproducing sunlight effect, the relations made in our memory are purely subjective, something that corresponds to Dreamery. In terms of materials, the metallic card gives a wider variety of manipulation and results.

**Further steps:** The shape could be positioned on the shelf or table side, depending on the skylight conditions, in order to have a better control of the effect. Meanwhile, in terms of visual comfort, mixing the material reflector with the filter is more suitable.

Table 11. Relation between illuminance and light temperature, between white room and wall painted.

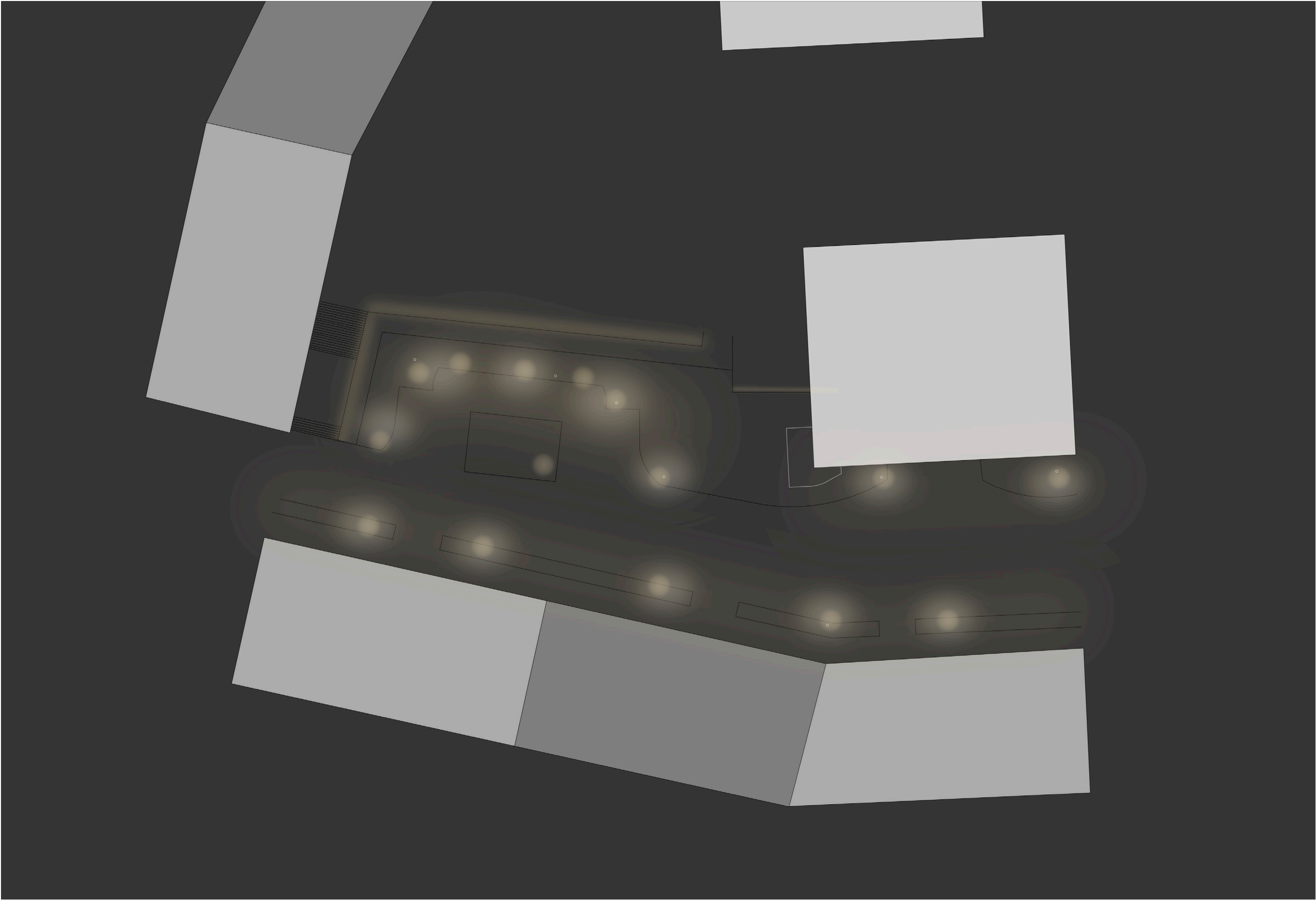
		17:45	18:00	18:15	18:30	18:45	18:46
13/05/20	White	52.21 lx	25.5 lx	18.8 lx	35.81 lx	44.5 lx	52.3 lx
	Colour	55.1lx	25.81 lx	16.3 lx	34.71 lx	43.5 lx	53.9 lx
	White	5212 K	5372 K	5386 K	5404 K	5236 K	5345 K
	Colour	5020 K	5138 K	5218 K	5238 K	5130 K	5238 K



The measurements were taken in the model. There is evidence to suggest that a painted wall can enhance light temperature.



Picture 42.- Urban lighting plan





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