

Beyond divisions: architecture as a universal catalyst of social cohesion

The influence of community centers on social relations and participation

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Master Graduation Thesis
Architectural Engineering Studio

Abstract

The socio-cultural and political divisions of the current day paired with the decay of public dialogue and skills related to respectful discussions, lead to the erosion of social cohesion becoming the 4th largest risk on a global scale within the upcoming decade according to the World Economic Forum. Since architecture is known to have the potential to influence human behavior, this paper aims to establish how can architecture become a catalyst of social cohesion through the investigation of community center case studies. Based on the theoretical framework the aspect of social cohesion that is selected for further research is social relations and participation. This aspect depends on the attendance of visitors at the place of social activities and their involvement in those activities. Generally, willingness to visit a space and the behavior on the site strongly depends on how comfortable people feel in the building. Thus, the aspect investigated in the architecture and interior design of the case studies is the perceived comfort (including, the form of the space, applied colors, lighting, and materials) and how the criteria of perceived comfort influence attendance and involvement. According to the findings, different environments create comfortable conditions for different activities. The four types of conditions identified in the research are a dynamic/active environment for large-group work, a dynamic/active environment for focus and individual work, a cozy, warm, mildly stimulating environment for informal interactions, and a calming/soothing environment for intimate conversations. The outcome of the research becomes a guideline for architects and designers to create diverse spaces to encourage interactions of different types and strengthen interpersonal relations.

Keywords social divisions, social cohesion, social relations and participation, public dialogue, attendance and involvement, interactions, architecture, community center

Introduction

Forming communities has always been an intrinsic part of humanity. Primarily, these social structures aimed to fulfill the basic needs of early humans who strived for survival and reproduction (Page & French, 2020). After the Neolithic agricultural revolution, which resulted in the creation of more permanent settlements, an increase in population, and a change in leadership form (Sadowski, 2017), the communities and their needs started to transform. These social transformations can be seen in the gradual development of urban structures more complex than purely residential villages, the creation of temples for spirituality, and town squares for commerce and official community assemblies.

One of the most modern developments in architecture, created as a response to an emerging community need is the idea of a community center. The changes in politics and the drive to unify social classes pushed toward the birth of community centers in the US and the UK at the beginning of the 20th century (Smith, 2002). At the foundation of these organizations was mainly the will to make adult education available, organize recreational activities, and promote the mixing and cooperation of people from different social classes (Smith, 2002). Thus, at the heart of community centers was the idea of community-building, past the boundaries created by the society of that time.

Nowadays, the need for this community-building beyond divisions seems to be more urgent than ever before. The modern, increasingly individualistic culture leads towards the decay of communities, which although might not be directly influencing survival or reproduction these days, are still crucial for the feeling of belonging, meaning, the general well-being of people, social capital, and thus also, social cohesion (Polimédio, 2018). The individualism paired with the increased anonymity especially visible in large cities due to rapid urbanization as well as the increased ethnic diversity of the population leads to a lack of common background and sense of belonging (Moustakas, 2023).

Increasingly, there is a need for the revival of spaces for social gatherings, aiming to increase interactions within diverse communities. The urgency of this matter has been underlined by the World Economic Forum which assessed the erosion of social cohesion to be the 4th most severe risk on a global scale within the upcoming decade (WEF, 2022). Therefore, the aim needs to be placed on preserving and restoring social cohesion worldwide.

Architecture needs to aid in this process. As described already in 1947 by Mess and King, “A good social life is dependent upon a good building” (Mess & King, 1947). However, social cohesion in architectural literature plays a negligible role. This issue might stem from the ambiguities around the definition of social cohesion in academic environments, which undermine the credibility of this concept. Although it seems that certain aspects of social cohesion, especially social interactions, might get wider coverage in the architectural literature, it is still a very minor branch of architectural research as a whole. Both of these problems reveal a need to define social cohesion, not only in the context of sociology or psychology but also in architecture, and point towards a knowledge gap that needs to be filled with research towards tangibly improving the influence of the built environment on social cohesion.

Thus, first, the paper aims to establish a definition and theoretical framework of social cohesion actionable in the context of architectural research. Second, the methods are outlined and the research itself is carried out in order to determine how can architecture become a universal catalyst of social cohesion. The research is based on the aforementioned community centers. The research is summarized and discussed, and finally, conclusions are drawn.

Theoretical framework

As the number of researchers investigating the topic of social cohesion rises, so does the overall confusion regarding its definition (Fredkin, 2004, p. 409). The variety of academic publications in the area of sociology and psychology mixes with several publications of governmental institutions that take responsibility for applying the theory in practice. Each party develops its own definition of the concept contributing to the disarray.

It seems to be a trend, that the causes of social cohesion become confused with its effects, especially in the policy-oriented literature (Chan et. al., 2006, p. 279). Various scientists researching social cohesion advocate for narrowing down its definition for the sake of clarification (Moustakas, 2023). Chan et. al. argue that a good definition should be “(1) minimal in scope and (2) close to ordinary usage” (Chan et. al., 2006, p. 280). Therefore, for the sake of this research, social cohesion is given the most basic definition related to the standard, daily use of the word “cohesion” provided by the Cambridge Dictionary. Thus, social cohesion is “the situation when the members of a society are united” (Cambridge Dictionary, n. d.). This minimalistic definition allows for the identification of various “aspects”, of social cohesion, both causes and effects, that fall within the definition of social cohesion in academic and policy-oriented literature. For the sake of clarity and openness to the variety of research approaches, these “aspects” are kept separate from the definition of social cohesion in this research. As a result, “aspects” can encompass both causes and effects without bringing confusion into the definition of the concept itself.

Furthermore, to identify the main aspects of social cohesion and build the theoretical framework for this study, various academic and policy-oriented literature was analysed and presented in the form of a matrix (tab. 1). The goal of this investigation was to find a common denominator in the broad variety of research and identify the guiding “aspects” for this study to be further pursued strictly within the area of the built environment.

Author Aspect	OECD	Council of Europe	Fonseca et. al.	Dragolov et. al.	Chan et. al.	Jenson	Schiefer & van der Noll
<i>well-being</i>		●	●				
<i>sense of belonging & a common identity</i>	●		●		●	●	●
<i>social relations & participation</i>	●		●	●	●	●	●
<i>recognition and acceptance of differences</i>		●	●	●		●	
<i>equality of opportunities</i>	●	●	●			●	
<i>avoiding marginalization</i>	●	●					
<i>mobility</i>	●						
<i>achieving welfare</i>		●					
<i>connectedness</i>				●			
<i>trust</i>	●			●	●		
<i>focus on the common good</i>				●			●
<i>cooperation</i>					●		
<i>legitimacy of social institutions</i>						●	

Table 1. The framework matrix presents different aspects of social cohesion and their implementation within different academic and policy-oriented literature (OECD, 2011; Council of Europe, 2010; Fonseca et. al., 2019; Dragolov et. al., 2013; Chan et. al., 2006; Jenson, 2010; Schiefer & van der Noll; 2012)

The outcome of the framework matrix analysis pointed towards “social relations and participation”, included within six out of seven investigated definitions, being the most prominent aspects of social cohesion. “Social relations and participation” are defined as “any relationship resulting from **interactions** between two or more individuals and a **person’s involvement in activities providing those interactions**” (Cash & Tony-Butler, 2022; Shewade et. al., 2024, p. 142).

The second most important aspect of social cohesion turned out to be the “sense of belonging and a common identity”, mentioned and phrased slightly differently in five out of seven investigated definitions. The “sense of belonging and a common identity” is defined as “a subjective feeling of deep connection with a social group, common interests, and shared experiences“ (Allen et. al., 2021; Zhang et. al., 2017).

The last two aspects, which were common for most of the literature, were the “recognition and acceptance of differences”, in some studies called “tolerance”, and “equality of opportunities”, both included in four out of seven publications. The “recognition and acceptance of differences” is self-explanatory and refers to the acceptance of diversity within a social group, while “equality of opportunities” is defined as “a political idea according to which participants in some cooperative system should possess equal access to some advantages at some point in time” (Navin, n. d.).

The last one, the “equality of opportunities”, is a concept difficult to attain within the area of architecture as it highly relies on the governmental bodies, and thus can hardly be directly influenced by building design, but rather by large-scale urban planning and policy-making. Therefore, for the sake of this study the “equality of opportunities” is not included in the final theoretical framework.

Similarly, the “sense of belonging and a common identity” and the “recognition and acceptance of differences” had to be omitted in the research. Although the “sense of belonging and a common identity” can be strengthened through architecture for example by design with regional features, the point of the project is to attain the highest possible level of universality. Thus, architectural references to specific cultures embedded in the building shall be avoided. Likewise, the “recognition and acceptance of differences” could be attempted, for example by highlighting architectural similarities between two cultures, as suggested by the Common Ingroup Identity Model. This model theory states that if members of two groups are conditioned to perceive each other as one group through highlighting commonalities, their attitudes towards the other group become more positive (Gaertner et al., 1993, p. 6). Even though this experimental integration of the socio-psychological theory in architecture could be interesting, the necessity to implement regional architectural features rules this option out.

As a result, the aspect of social cohesion considered in this research is “social relations and participation”. The close linkage between the surrounding environment, perceived comfort or discomfort, and human behavior is incorporated in order to place social cohesion, in this case mainly “social relations and participation”, in the architectural context (Smulders & Vink, 2021). The community centers thus will be investigated in the context of their capacity to influence behavior through comfort or discomfort. The main research question is how does the perceived comfort of community centers stimulate social relations and participation.

According to the definitions mentioned above, “social relations and participation” can be split into two sub-aspects: the interactions, and the involvement in the activities providing the interactions. Thus, what is necessary to achieve “social relations and participation” are (1) attendance at the place of the activity in order to create the interaction, (2) the activity itself as the source of interaction, (3) and involvement in the activity/interaction. The (2) activity itself will be designed and developed in the further stages of the project, thus in this research, the main goal is to find architectural tools that guide the (1) attendance and (3) involvement.

Methods

The way in which architecture shapes attendance and involvement in the context of social relations and participation will be investigated based on ten case studies of various community centers of approximately 350m² or less. The case studies are selected from the ArchDaily database based on their diversity in form, color lighting and material to achieve the largest variety in architectural expressions and allow for the most complete analysis of the influence of architecture on attendance and involvement.

The community centers’ perceived comfort is analyzed based on those four criteria: form (including size, shape, and proportions), color (including hue, lightness, saturation, and contrast), lighting (including hue/temperature, intensity, and contrast), and material (including texture and perceived temperature). The research sub-question investigating those qualities is how do form, color, lighting, and material of a space influence perceived comfort. The analysis is carried out by means of visual examination and descriptive analysis of case studies. The expected

result is a description of how each of the four criteria influences perceived comfort, aiming to provide awareness of how certain design decisions influence perceived comfort (appendix 1).

In order to relate those qualities back to social relations and participation, the second sub-question is how does the perceived comfort of a space stimulate attendance and involvement as aspects of social relations and participation. This allows for the identification of how certain design decisions and visitors' perceptions of comfort influence human behavior. The analysis is carried out by means of visual examination and descriptive analysis of case studies based on the following template (appendix 2).

The research is based on visual assessment, thus the main source of knowledge is photographs. The photographs are taken with different variables, for example, from different angles and at different times of the day, providing a certain type of bias. The selected criteria of assessment also influence each other strengthening certain visual effects. These biases should be kept in mind during the research process and minimized as much as possible by careful selection of compared photographs. The character of the whole research is also subjective, thus based on the personal preference and perspective of the researcher. The potential further step towards the objectivization of the results would be a survey to confirm that the perceptive assumptions made in the research process are in agreement with the perspective of the majority of the general public.

Results & discussion

The results section is organized by criteria of analysis (form, color, lighting, and material). Each criterium is analyzed and discussed in the context of influence on attendance and involvement. Certain, additional aspects influencing the attendance and involvement which are not related to the criteria, however, have been identified during the research, are discussed in the last part of the section. Finally, the results are arranged in a diagram providing a guideline on how to create a comfortable space for improving attendance and involvement.

The form of the interior space of community centers and its influence on attendance and involvement has been evaluated in the context of size, shape, and proportions. What turned out to be important when it comes to the size of the space is the diversity. This allows for the organization of various types of activities increasing the potential attendance. An alternative approach to creating many spaces of different sizes is the creation of one continuous space which can be subdivided into smaller rooms with movable divisions to allow for flexibility. This option can be especially useful for smaller community centers which need to adapt to different circumstances.

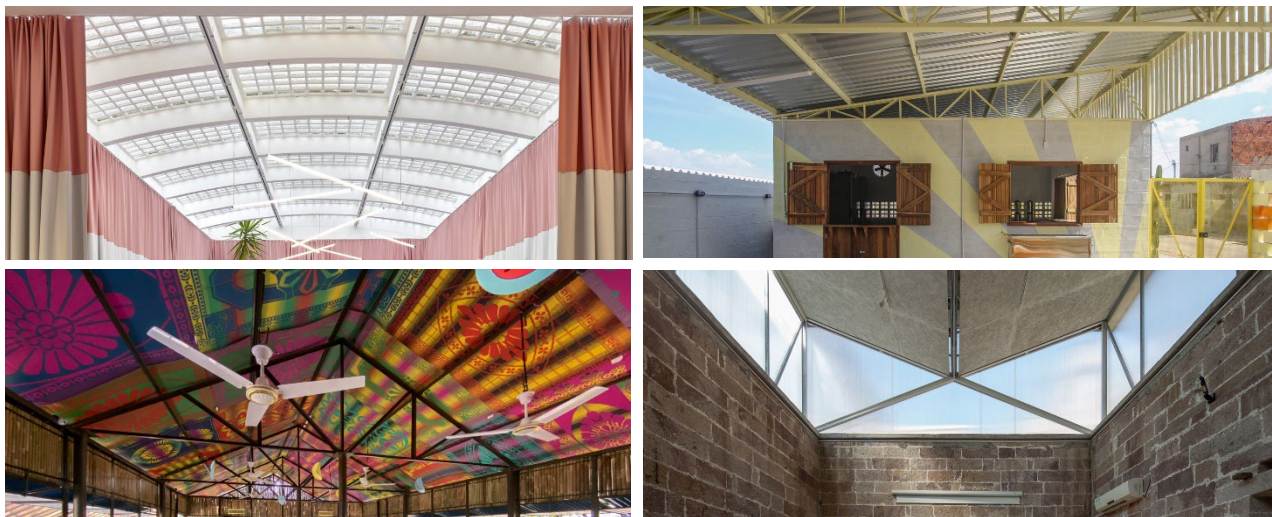


Figure 1. Comparison of various shapes of ceilings, (1) OpenLab Altenburg, (2) Soup of Hope, (3) Hindu-paraRohingya Community Center, (4) the Common Space. ArchDaily.

When considering the shape of a space, the shapes dominating among the researched case studies were squares and rectangles, due to their functionality. The diversity in shape appeared, however in the context of the roofs and ceilings. In the case of the OpenLab building (fig. 1.1) the arched ceiling gives an impression of surrounding

or being more enclosed, hugged by the space. The Soup of Hope project (fig. 1.2) opens up towards the entrance, inviting to visit the space and creates a cozy corner on the opposite side. In the case of the Hindu-paraRohingya Community (fig. 1.3) the pitched roof makes an impression of a traditional home. Finally, in the Common Space (fig. 1.4) the inverted triangular ceiling aims to counteract the enclosed and cramped space, making it more dynamic.

The ceiling plays a role also in the case of proportions. Its height is crucial in experiencing the space. The ceilings of PannKa Part Play (fig. 2.1) are extremely high (approximately 5 meters) making the rooms appear more spacious. The high ceiling gives a feeling of freedom. This is especially visible in the case of the MAE-AN-GEO Village Community Center (fig. 2.2). The presence of both low and high ceilings gives a possibility to compare its effects on the space and the person. The low ceilings are calming, and the space becomes cozy, but the area with a high ceiling further away on the photograph seems to be calling the visitor, promising an experience. In fact, because of that, the image itself holds a type of tension. Looking at the still frame appears a wish to move it a few meters further to the front and satisfy the curiosity, claim the promised experience. The low ceiling, on the other hand, although cozy and calming, may give a cramped, confined, or even claustrophobic effect when applied in a very small space like in the Jardin Robinson du Lignon (fig. 2.3), and thus should be incorporated with appropriate lighting and materials to avoid sensory discomfort and lowered involvement.

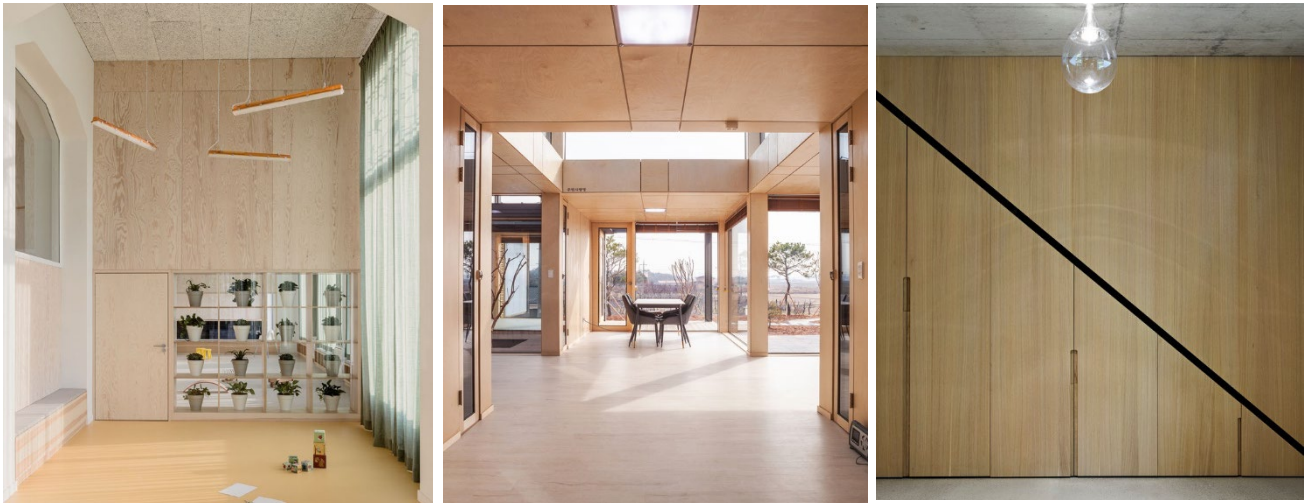


Figure 2. Comparison of ceiling heights and overall proportions, (1) PannKa Part Play, (2) MAE-AN-GEO Village Community Center, (3) Jardin Robinson du Lignon. ArchDaily.

When it comes to the colors, the warm hues trigger arousal and excitement more than the cold ones, increasing the involvement in interactions. Warmer colors tend to bring out positive emotions, love, passion, and happiness and lead to higher arousal like in the case of the Soup of Hope center (fig. 3.1), but may also evoke a cozy feeling. Cool tones are more calming and soothing. In the case of some shades and color combinations, the cool tones may evoke certain kinds of indifference visible for example in the case of the La C@va Youth Center (fig. 3.2), however, might also be more appropriate for spaces dedicated to focused work, rather than interactions.



Figure 3. Comparison of warm and cold hues, (1) Soup of Hope, (2) Youth Center La C@va. ArchDaily.

The lightness of a color is also an important consideration. Due to the lightness of applied colors, the entrance interior part of the Otica Native Community Center (fig. 4.1), although much more open, seems to contain less daylight than the Pannka Part Play (fig. 4.2), a room, that only sources light from another interior space through clerestory windows. The ability of lighter colors to reflect rather than absorb light allows for the creation of brighter, more lightweight spaces usually perceived as more comfortable since people naturally tend to prefer higher levels of perceived illumination during the day. Darker shades tend to create spaces more appropriate for evening or simply relaxation, reducing visual stimuli and making the space feel more cozy.



Figure 4. Comparison of lightness of color, (1) Otica Native Community Center, (2) PannKa Part Play. ArchDaily.

Colors can be also considered in the context of their saturation and contrasts. The more saturated colors are more lively and have an effect similar to warm hues – arousal. This effect can be observed in the case of the OpenLab Altenburg interiors (fig. 5.1 & fig. 5.2), the space looks interesting and exciting. In the OpenLab the colors are selected to contrast (or in other words complement) each other in a triad relationship, reaching a balance. Thanks to that harmony, the colors seem more prominent and brighter. However, what needs to be considered is the potential of intense colors to cause tiredness and have a negative influence on attention and involvement in the long run.

Quite the opposite effect when it comes to saturation and contrast is reached in the Common Space (fig. 5.3). The overall saturation is low aside from the black elements, used as the only contrasting accents in the minimalistic interior. The space is calmer and less stimulating, promoting focus and composure. May, on the other hand, become boring and lower the energy of visitors.

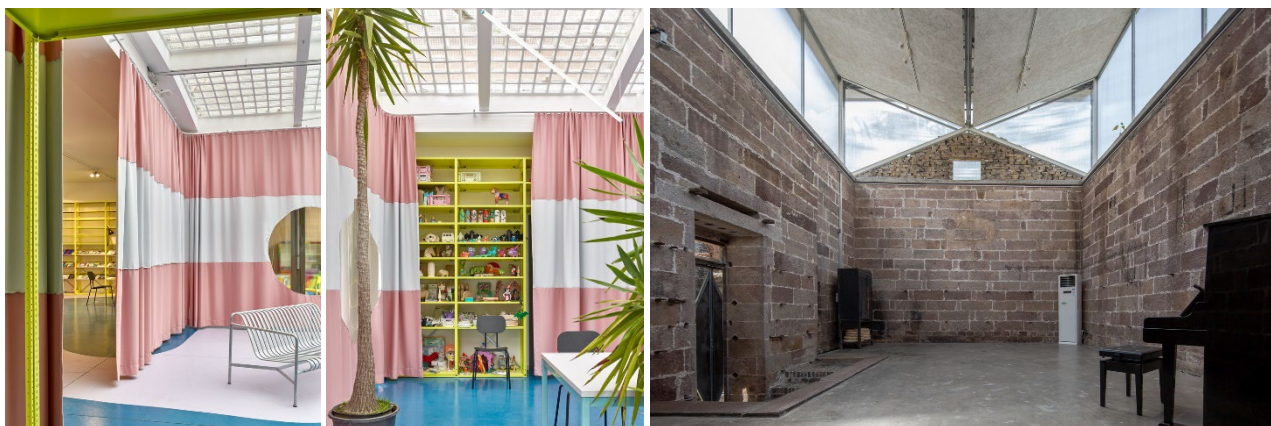


Figure 5. Comparison of saturation and contrasts, (1 & 2) OpenLab Altenburg, (3) the Common Space. ArchDaily.

The lighting of a space can be considered from the perspective of natural and artificial light. The hue or temperature of natural light, although varies during the day, is considered to be approximately 5000K, while the temperature of artificial light can vary significantly. In the case of reviewed community centers the hue of

artificial lighting was never set to unnatural colors like violet, or green. The temperature, however, varied between around 3000K in Youth Center La C@va (fig. 6.1) and 6000K in Jardin Robinson du Lignon (fig. 6.3). The former, created a cozy atmosphere, a warm glow inviting to relax in the easeful interior, the later, gives an impression of cold laboratory space, stimulating to focus and work. A certain middle ground can be found in the OpenLab Altenburg (fig. 6.2), where light is slightly warmer (4000-4500K) than an average natural, making the space cozy, but still creating a comfortable environment for focused work.



Figure 6. Comparison of light temperature, (1) Youth Center La C@va, (2) OpenLab Altenburg, (3) Jardin Robinson du Lignon. ArchDaily.

The lighting conditions can also be compared in the context of intensity and contrast. The high light intensity environments like the “Big Family” Community Center (fig. 7.1) with strong artificial lighting and the MAE-AN-GEO Village Community Center (fig 7.2) with intense natural lighting tend to make people feel more energetic, active, and involved. Especially when it comes to natural light, spending time in well-lit environments is linked to better mood, overall well-being, and sleep quality. The high-intensity light leaves also little space for contrast. Thus, it is usually the dimmer environments with a spotlight like in the Jardin Robinson du Lignon (fig. 7.4) that show more contrast. While dimmer spaces, in general, might bring a feeling of relaxation thanks to lesser sensory stimulation like in the case of Otica Native Community Center (fig. 7.3), where a large roof does not let light reach the center of the building, a sharp and bright spotlight, thus high contrast, could cause discomfort, especially when the temperature of the light is high (fig. 7.4).



Figure 7. Comparison of light intensity and contrast, (1) “Big Family” Community Center, (2) MAE-AN-GEO Village Community Center, (3) Otica Native Community Center, (4) Jardin Robinson du Lignon. ArchDaily.

The last criterion in this research, the materials, are approached from the perspective of texture and perceived temperature. Based on the case studies, it is possible to make the flagship comparisons of sensory architecture - “the wood has a warm, cozy expression, while concrete is heavy and cold”. What is more interesting, however, is how the texture influences the effect of perceived temperature, for example, polished concrete (fig. 8.2) due to its shine seems colder than rough concrete (fig. 8.1), possibly due to an association of shine and ice, glass or metal, which are usually experienced as cold when coming in contact with the human skin.



Figure 8. Unpolished and polished concrete, (1) Otica Native Community Center, (2) “Big Family” Community Center. ArchDaily.

All the aforementioned criteria are difficult to assess in an interior, where they all coexist together at the same time, leading to a slight bias due to the way they influence each other. However, the expression of the material seems to be especially affected by those influences, namely color and lighting. Its color and the warmth of the shade seem to change the way the temperature of the material is perceived visually. Although the lighting temperature is consistent throughout the Jardin Robinson du Lignon, the shade of the wood elements in the first photograph is slightly cooler (fig. 9.1) making it appear colder than the wooden cabinets in the second photograph (fig. 9.2). Conversely, although the same color, the brown brick of the Common Space seems warmer with direct sunlight hitting the wall (fig. 10.2) rather than with indirect natural lighting (fig. 10.1). This suggests that the materials perceived temperature is strongly dependent on other criteria, and cannot be implemented in the space as a solution while ignoring color and lighting, as those two may have more influence on the human perception than the material itself.

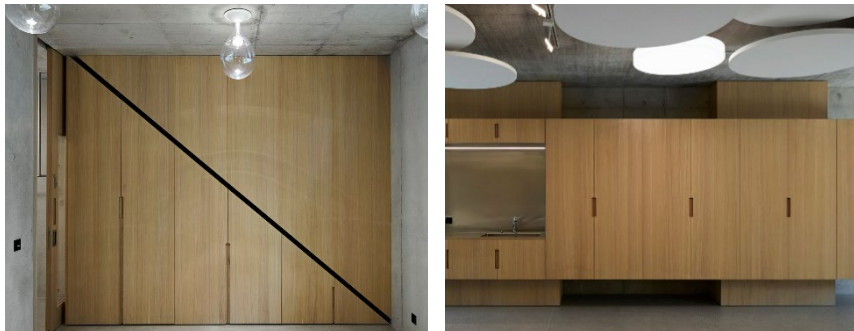


Figure 9. Visually perceived temperature of a material vs. color, (1 & 2) Jardin Robinson du Lignon. ArchDaily.



Figure 10. Visually perceived temperature of a material vs. lighting, (1 & 2) the Common Space. ArchDaily.

Additionally, some conclusions resulting from the research have been drawn outside of the intended criteria and are not related to the perceived comfort, however, they could influence attendance and involvement. Firstly, the community center should offer another activity than just a space for workshops, possibly functioning most days of a week, to attract people, for example, a café. This additional function could increase attendance in the building, and over time, also the involvement in the offered workshop activities and the community itself. Secondly, a themed space, like in the case of the PannKa Part Play, which is a community center specifically catered to children (aged 0-6) and their parents, gathers a specific target group and suggests a potential topic of conversation (children, kindergartens, etc.) improving the involvement. Thirdly, architecture can be used as an attractive factor, catching attention and making people curious through its particular appearance from the

exterior, this way increasing attendance. Finally, the furniture and its arrangement play a role in the involvement of visitors with one another. The MAE-AN-GEO Village Community Center is equipped with long tables allowing many people to sit together, facing each other, strengthening their involvement in the interactions. The furniture design and its arrangement should be considered in the design just as carefully as the criteria established and evaluated above.

What was an expected result from the research was a direct indication of the factors leading to perceived comfort and discomfort. What the research has proven, however, is that different qualities, serve different circumstances and need to be adjusted accordingly to the aim and function of a design. Attendance and involvement may depend on the comfort of the space, but the concept of comfortable space varies depending on the function. A space comfortable for children to do their homework in the afterschool community center classes is not comfortable for relaxation and small, casual gatherings of adult friends after work. Thus, there is no defined answer to what type of lighting or material needs to be applied to achieve higher attendance and involvement, because the circumstances differ. Nonetheless, the results of the research described above can be used as a guideline for a designer to make decisions based on the needs of the community and the intended purpose of the design. In order to make the results more approachable they have been summarized, rearranged, and presented in the form of a table (tab. 2).

Type of space Criterion	General	Dynamic/active (work)	Cozy/calming (relax)
<i>Form - size</i>	Rooms of various size or one large flexible space	-	-
<i>Form - shape</i>	Square or rectangular room, experiments with the shape of the ceiling	Inverted triangle ceiling or another sharp-edged form	Arched ceiling or another round form
<i>Form - proportions</i>	-	High ceiling, large or medium sized room	Low ceiling, small or medium sized room
<i>Color - hue</i>	-	Warmer hues for arousal (e.g. spaces for groupwork) and cooler hues for focus (e.g. individual work)	Warmer hues for cozy, warming feeling and cooler hues for soothing and calming
<i>Color - lightness</i>	-	Ligher tones	Darker tones
<i>Color - saturation</i>	-	Higher saturation for arousal (e.g. spaces for groupwork) and lower for focus (e.g. individual work)	Higher saturation for cozy, warming feeling and lower for soothing and coming
<i>Color - contrast</i>	Contrast (complimentary tones) is generally advised as it makes the space more interesting	Higher contrast for arousal (e.g. spaces for groupwork) and lower for focus (e.g. individual work)	Higher contrast for cozy, warming feeling and lower for soothing and coming
<i>Lighting - hue/temperature</i>	Hue spectrum of natural light	Higher temperature 4500-6000K	Lower temperature 3000-4500K
<i>Lighting - intensity</i>	-	Higher intensity (bright)	Lower intensity (dim)
<i>Lighting - contrast</i>	Low contrast/unifrmly lit in both bright and dim conditions	-	-
<i>Material - texture</i>	Texture affects the perceived temperature of a material	-	-
<i>Material - perceived temperature</i>	Lighting and color of a material affect the perceived temperature	Materials with colder expression	Materials with warmer expression

Table 2. The results of the perceived comfort arranged according to the type of space intended to be achieved through design.

Conclusion

Attendance and involvement, and thus also social relations and participation, are dependent on the perceived comfort of a space. The perceived comfort differs with the function of the space. There is, however, some advice applicable to all spaces in general not dependent on their character. Firstly, the diversity of sizes of available spaces or a larger flexible space allows for a wider range of activities organized at the same time thus increasing attendance of people with different interests. Secondly, the spaces should be square or rectangular as these types of rooms tend to be more practical. The shape can be altered by the form of the ceiling without losing the practicality of angled rooms. Thirdly, the colors applied in the interiors should generally be contrasting to make the space more interesting. An interesting space increases attendance. Finally, the hue spectrum of natural light and uniformly lit space ensure comfort.

When it comes to creating dynamic, energetic spaces for various group activities, firstly, the ceiling should have a sharp-edged form, to underline spaciousness. The room should be high and large or at least medium-sized. This voluminous character leads to improved mood, openness, and creativity. Secondly, the color hues incorporated in the interior should be warm, highly saturated, and highly contrasting to trigger arousal and result in higher involvement in the activities. It is also advised to choose lighter tones to brighten up the space. Thirdly, the lighting should be of temperature between 4500 and 6000K and high intensity. Finally, the materials selected for the project should have slightly colder expression. Similar advice should be applied when designing dynamic spaces for individual activities, with the difference in choosing cooler tones and lower saturation and contrast of those tones to achieve focus rather than arousal.

In the case of spaces intended to be cozy and warm, firstly, the ceiling should be arched or rounded to create a feeling of being hugged by the space. The room should be lower and small or medium-sized. Smaller spaces tend to feel cozier. Secondly, the color hues incorporated in the interior should be warm, highly saturated, and highly contrasting for a cozy warm effect. It is also advised to choose darker tones. Thirdly, the lighting should be of temperature between 3000 and 4500K and low intensity, to reduce visual stimuli, allow for relaxation, and create a different type of dynamic in the interactions. Finally, the materials selected for the project should have a warmer expression for a cozy effect. Similar rules can be applied to spaces intended for calming and soothing, with the difference in choosing cooler tones and lower saturation and contrast.

Apart from the perceived comfort, attendance and involvement depend also a few other aspects revealed through the research. Firstly, the community center should offer other activity than just a space for workshops, for example, a café, to attract people. This additional function could increase attendance in the building, and over time, also the involvement in the workshops and community itself. Secondly, a themed space, like in the case of the PannKa Part Play, which is a community center specifically catered to children (aged 0-6) and their parents, gathers a specific target group and suggests a potential topic of conversation (children, kindergartens, etc.) improving the involvement. Thirdly, architecture can be used as an attractive factor, catching attention and making people curious through its particular appearance from the exterior, this way increasing attendance. Finally, the furniture and its arrangement play a role in the involvement of visitors with one another. The MAE-AN-GEO Village Community Center is equipped with long tables allowing many people to sit together, facing each other, strengthening their involvement in the interactions. The furniture design and its arrangement should be considered in the design just as carefully as the criteria established and evaluated above.

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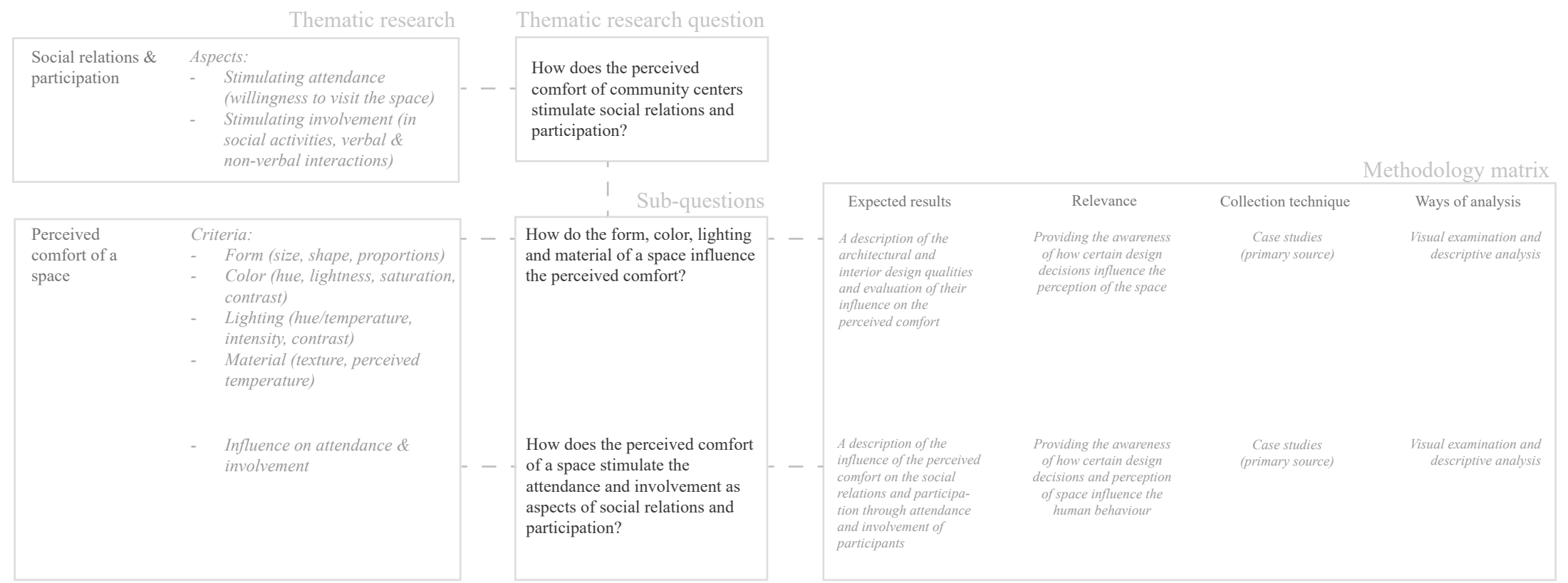
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Case study profile photo

Name: of the building
Function: type of community center
Location: city, country
Area: in square meters
Year: of building
Architect: name of the architect or company

Characteristics:

- Form: *size, shape, proportions*
- Color: *hue, lightness, saturation, contrast*
- Lighting: *hue/temperature, intensity, contrast*
- Material: *texture, perceived temperature*
- Influence on attendance & involvement: *first related, then unrelated to the preceding criteria of evaluation*

Photo of the interior

Photo of the interior

Photo of the interior

Photo of the interior

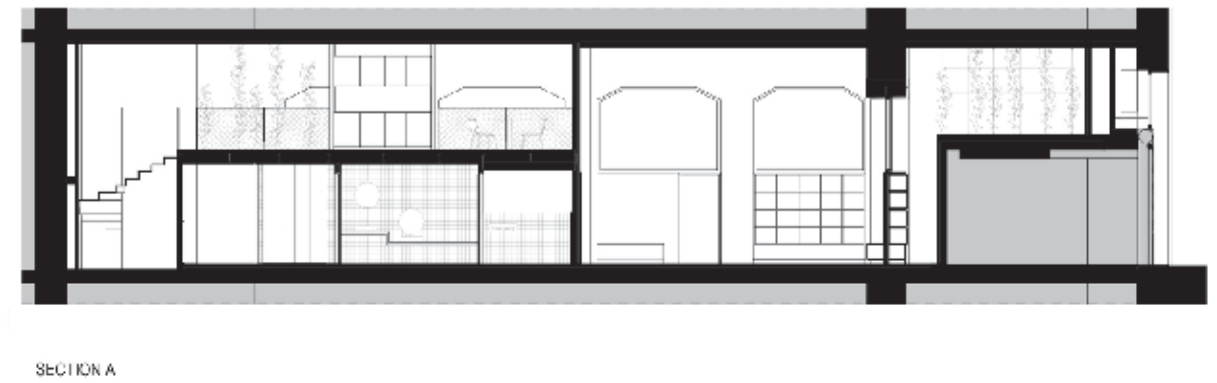
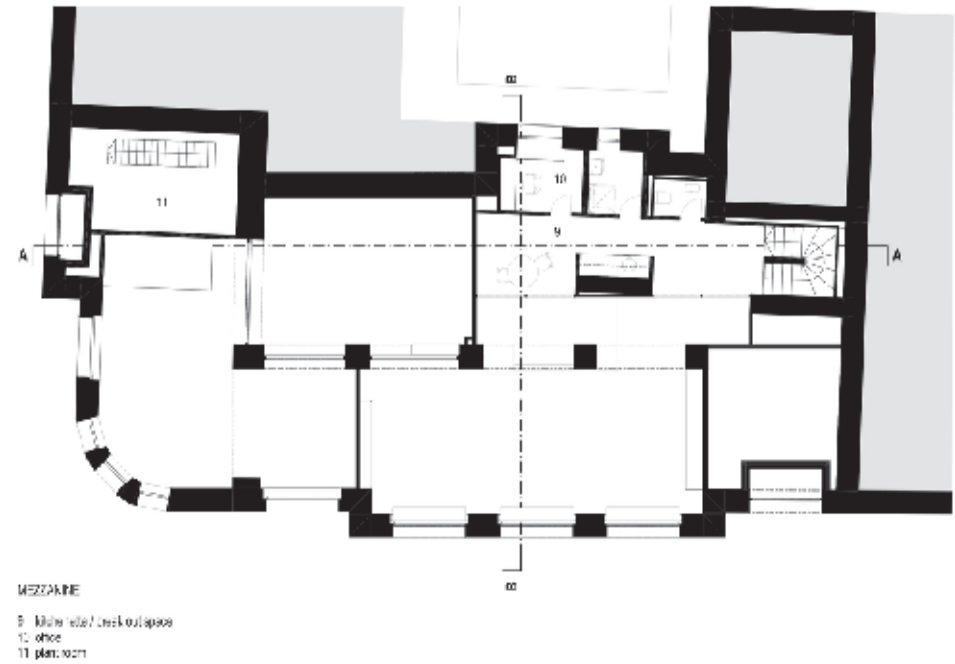
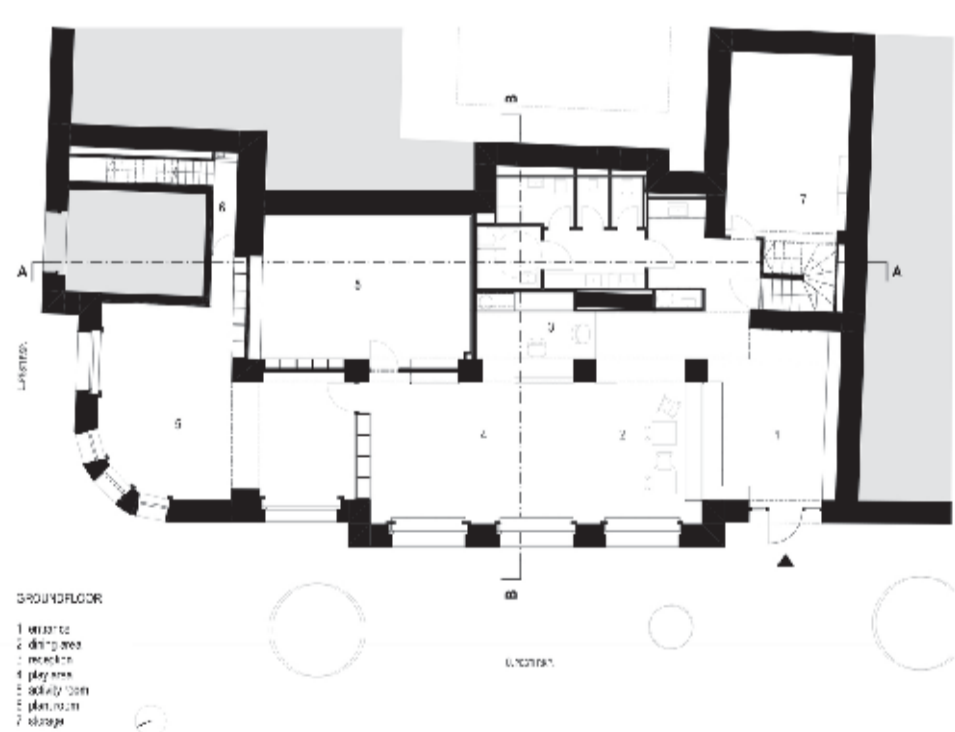
Technical drawing of the building

Photo or a technical drawing of the building/interior



Name: PannKa Part Play & Community Center
Function: Children playroom & community center
Location: Budapest, Hungary
Area: 353 m2
Year: 2022
Architect: ARCHIKON ARCHITECTS

- Characteristics:*
- Form: medium size spaces - big enough to accommodate the functions, but still cozy, high ceilings and openness make the room feel more spacious.
 - Color: neutral colors picked to serve as a background for colorful toys, balanced warm and cool shades of beige, high lightness, medium saturation, low contrasts, creates a pleasant soft space that feels safe.
 - Lighting: large windows - a lot of natural light temp. approx. 5000K, beige interior reflects the light, high ceiling allows for light to penetrate to the back of the building, medium intensity, low contrast, pleasant.
 - Material: wooden interior elements add a muted, mellow texture, give the feeling of warmth increasing the level of comfort.
 - Influence on attendance & involvement: parents can get involved in an interaction with their children but also other parents, the double function suggests a topic for conversation (parents can talk about their experiences related to parenthood as a conversation starter). Relation to the outside - catching attention of people passing by through large windows - additional interactions and potential increase in attendance as new potential visitors notice the play and community center. Pleasant, safe spaces like this one, make people relaxed and more willing to interact.

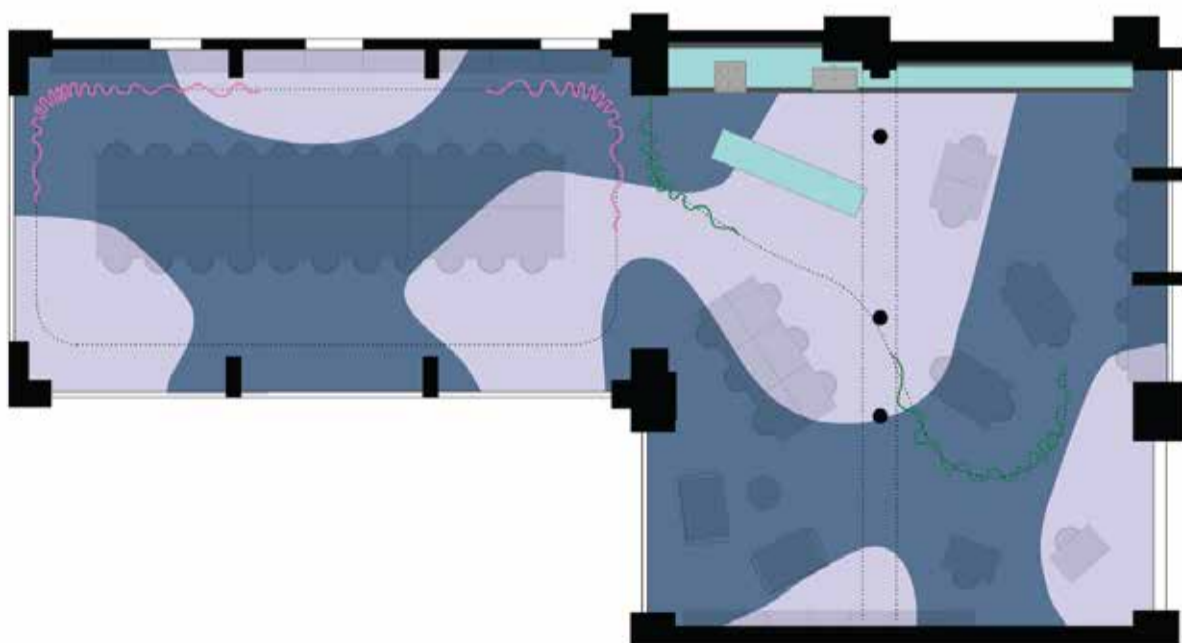




Name: Open Lab Co-Working Altenburg
Function: Mixed use, co-working, startup seminars, handicraft workshops, parties, cafe & community center
Location: Altenburg, Germany
Area: 180 m2
Year: 2021
Architect: Meier Unger

Characteristics:

- Form: Large open space, 180m2 one room, the pattern on the linoleum floor emphasizes the continuity and spaciousness of the room, the curtains can divide the space into smaller ones.
- Color: variety of hues give a cheerful character to the space, the lightness is balanced, the space does not seem dark, low saturation ensures that the colors do not become a distraction (except yellow storage shelves, however those are mostly concealed by curtains for visual comfort), moderate contrast makes the space interesting.
- Lighting: a lot of natural light thanks to the translucent glass ceiling, artificial light slightly warmer than natural light 4000-4500K making the space feel more cozy, moderate intensity and low contrast, linoleum on the floor reflects the light brightening the space.
- Material: linoleum as a material gives a warmer (but lower quality than e.g. wood) feeling to the space, textile curtains also make the space more warm and cozy creating an interesting contrast with a cold glass ceiling.
- Influence on attendance & involvement: The kitchen can be used by everyone and is designed as a long counter to organize interactions along it. The variety of functions ensures the attendance and attraction of various people.



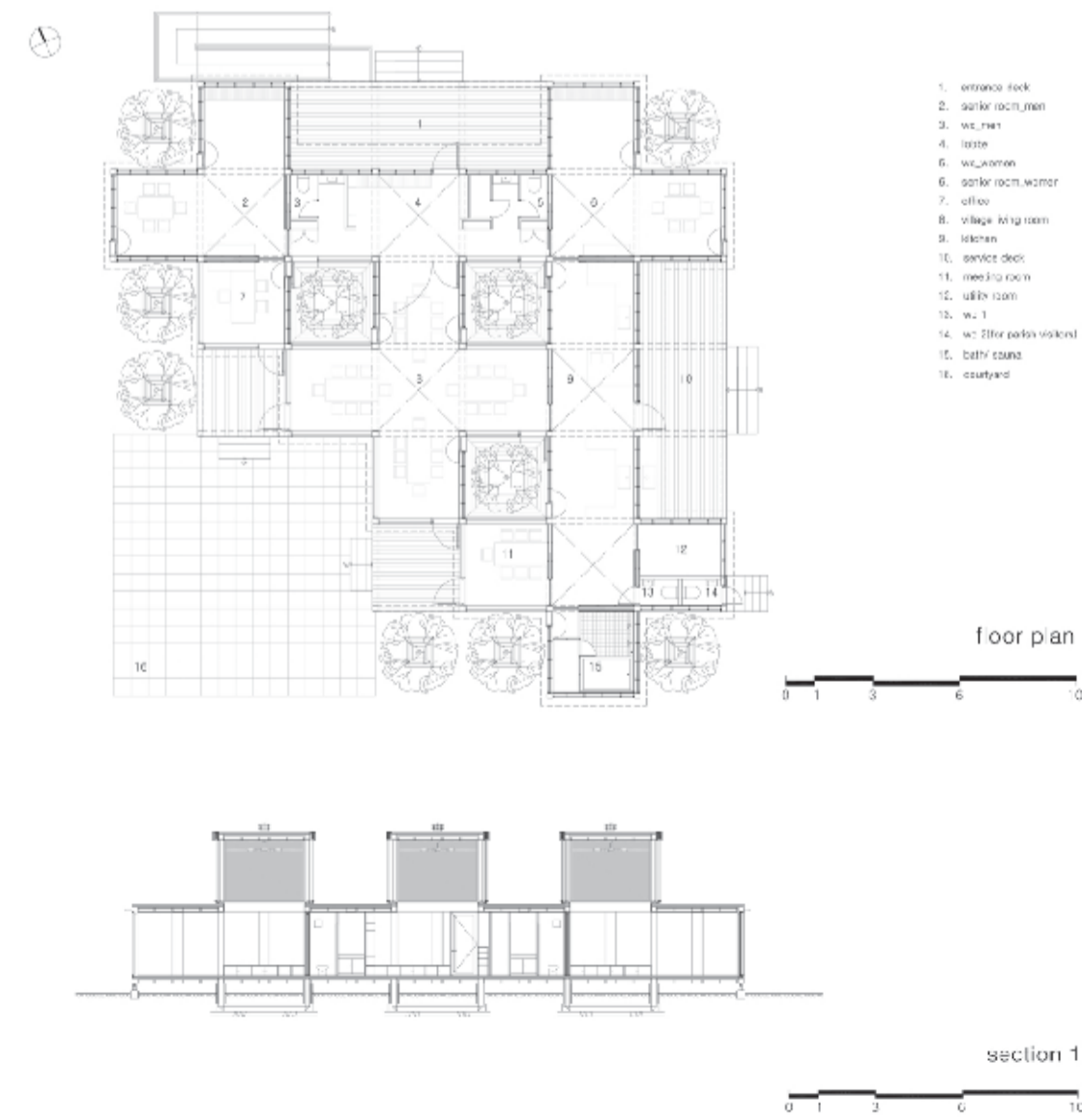
Open Lab Altenburg
M 1:100



Name: MAE-AN-GEO Village Community Center
Function: Community center
Location: Dangjin-Si, South Korea
Area: 198 m2
Year: 2022
Architect: Studio Zozo

Characteristics:

- Form: small spaces, a lot of corridors and passages, and low ceilings give a feeling of intimacy. The elevated light towers contrasted with the generally low ceilings give an unexpected feeling of spaciousness.
- Color: neutral colors create a calm space to relax and interact, could however become plain and boring for some people. Lightness is still quite high but so is the saturation, thus making the space feel very warm despite domination of shades of beige. The main contrasting element is the black-white furniture, it is noticeable, although still toned down, inviting to be used.
- Lighting: large windows and elevated light towers provide the space with a lot of natural light approx. 5000K, sun shading installed in the windows and light towers to avoid excessive lighting and keep the intensity in a comfortable range, low contrasts - space lit up uniformly.
- Material: wooden interior gives a feeling of warmth. Leather chairs and white marble table tops give a feeling of reliability. Thanks to the wooden interior the furniture does not seem exaggerated or luxurious, which could scare off some visitors by giving a wrong idea about the space.
- Influence on attendance & involvement: Having entrances from every side of the building makes it seem more inviting and may have a positive influence on the attendance. The medium and large size tables with multiple chairs ad the main type of furniture in the building suggest the community involvement, everyone can sit at the table and interact.



Name: Soup of Hope
Function: Food distribution center & Community center
Location: Juazeiro, Brazil
Area: 200 m2
Year: 2023
Architect: Tadu Arquitetura

- Characteristics:*
- Form: medium sized dining room, roof shape opens the space up towards the entrance and creates a cozy corner on the opposite side.
 - Color: warm hues yellow and orange, the main yellow shade is of high lightness and lower saturation to brighten the space without making it too intense, on the other hand the details are much more saturated yellow and orange. The contrast is not too high but it is enough to add liveliness to the space.
 - Lighting: the direct sunlight is mainly available in the morning from the side with the lower roof, and the opposite side (as in the pictures) in the afternoon. The sun is used to create an interesting pattern on the ground through the breezeblock wall. The light intensity is balanced, there is no intense contrast in lighting levels within the space.
 - Material: the main building materials are metal and hollow concrete blocks. The material give a feeling of coldness and roughness, which may seem negative at first but in warm climates it is that coldness that provides comfort. The wood then is used for the elements that are actually touched by people like tables, benches, countertops and shutters.
 - Influence on attendance & involvement: the colors make the building visible from the street and inviting, the aim of the building is to distribute food, thus those in need gather and are then seated together at a table to interact over a meal - a very traditional way of building relationships.





Name: New Center for Oticia Native Community
Function: Learning & Community center
Location: Rio Tambo, Peru
Area: 230 m2
Year: 2019
Architect: Marta Maccaglia, Semillas

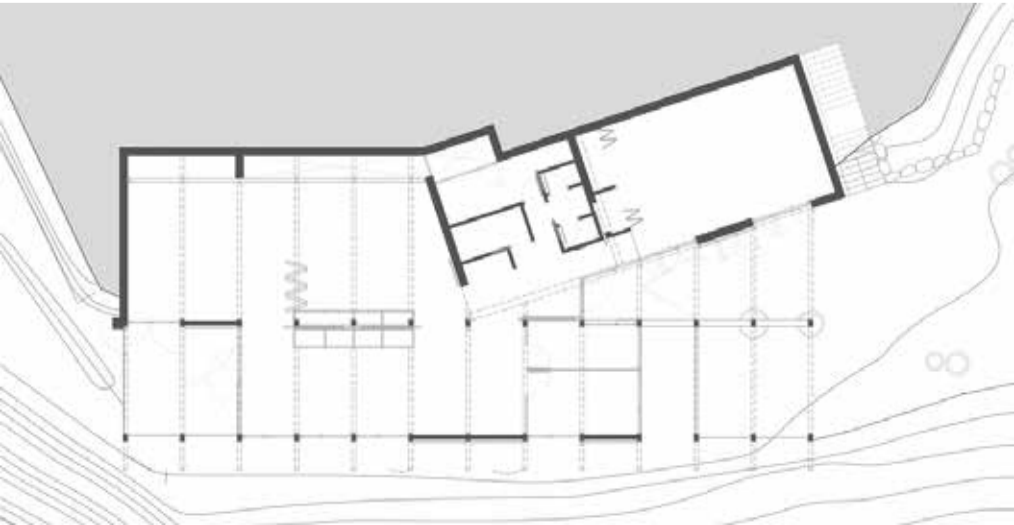
- Characteristics:*
- Form: large, open room with high ceiling giving a feeling of spaciousness. Might feel too big for an intimate experience but it can serve for large community events.
 - Color: the colors are dark and low saturated, tones of brown and grey. There is little contrast between the colors making the interior dull. It can be seen in the pictures that the community decided to decorate the building themselves to add some more intense color.
 - Lighting: the natural lighting intensity varies depending on the depth. Deep inside the contrast becomes high and the interior is rather dark.
 - Material: the main materials used are concrete (foundation) and wood (columns and roof). The soft textures are present on both materials but neither is dominantly prominent. The clod concrete foundation is also used as a floor and a sitting space.
 - Influence on attendance & involvement: the act of decorating the space by the community could potentially increase the attendance as it becomes more of “their own” building. The involvement in the activities seems high probably due to the versatility of the space which allowed for various activities fulfilling the need of the Otica community.



Name: Youth Center La C@va
Function: Community center for youth activities
Location: Bigues i Riells, Spain
Area: 301 m²
Year: 2020
Architect: aquidos

Characteristics:

- Form: large building with variety of different spaces, possible to change the sizes by applying divisions.
- Color: the color palette is limited to black, white and shades of gray and shades of beige in case of wooden elements. The colors are rather light and low saturated. Whenever black is applied it creates a significant contrast and is easily noticeable, thus it is used for important elements like signs (could be omitted for one of the walls to strengthen the effect).
- Lighting: the daytime, low intensity, artificial light in the photos below matches the natural light making it well, uniformly lit up with low contrasts, the evening light on the other hand is much warmer than natural light approx. 3000K giving an inviting glow and a warm atmosphere.
- Material: the materials other than the wood, with all their textures give a strongly industrial feeling. The corrugated steel ceiling with the exposed pipes, ducts, vents and other metal/metalic elements becomes unpleasant.
- Influence on attendance & involvement: the building is large and provides a variety of different spaces for different activities thus might attract youth as intended. However, to actually ensure the regular attendance of youth the space needs to be “cool” and speak to their identities. Although the “industrial” character could achieve that, it would have to be much more rough.

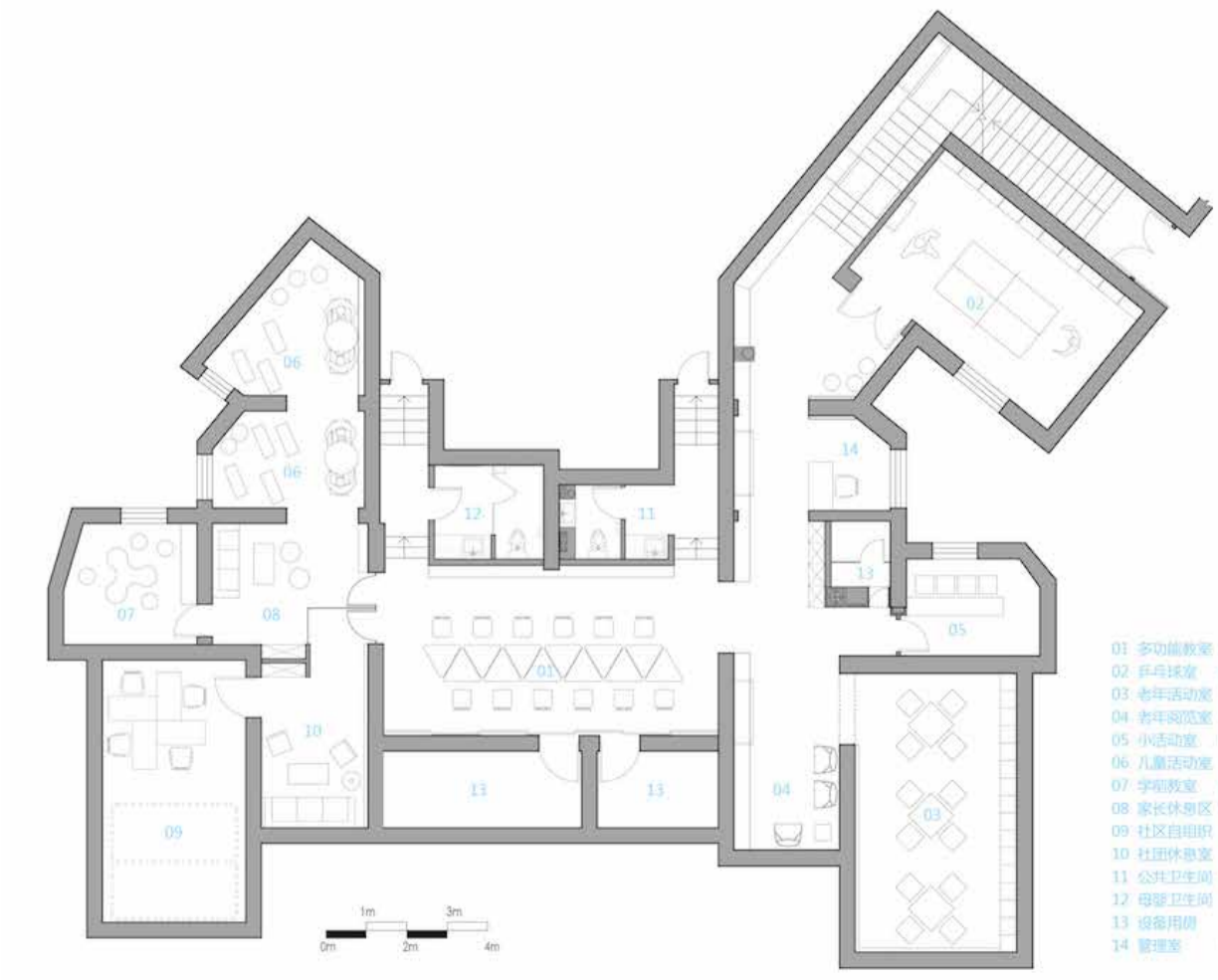




Name: “Big Family” Community Center
Function: Community center for people of every age
Location: Beijing, China
Area: 300 m2
Year: 2016
Architect: MAT Office

Characteristics:

- Form: the form is complex, with a lot of rooms of different size, the whole building is placed underground so the interior form does not have a reflection on the exterior.
- Color: the hue of applied colors is generally cold, with high lightness, even yellow or wooden beige elements are of rather low saturation which gives them a colder feeling. Contrast is low.
- Lighting: natural lighting is not available in the building. The artificial lighting is cold, colder than natural sunlight at approx. 6000K temperature, the intensity is high giving a feeling of a laboratory lighting. Due to high intensity, the contrasts are low.
- Material: the building is predominantly made out of concrete. Especially, the polished concrete floors and plastered walls with little texture give a feeling of coldness. The architects themselves mention that in the room intended for children and seniors they added wood to warm up the space, succeeding in that matter. However, the dominating materials still give an impression of coldness for the rest of the building.
- Influence on attendance & involvement: the underground location of the center might have a negative effect on the attendance, as the building may go unnoticed by some part of the community. The involvement may be affected by lack of natural light, which negatively influences the well-being of people, especially when combined with intense, white artificial lighting. Other than that, the spaces are varied allowing for different activities, both in bigger and smaller groups. The furniture is easily adjustable and suitable for changes of function. Variety of functions leads to potential increase in attendance.

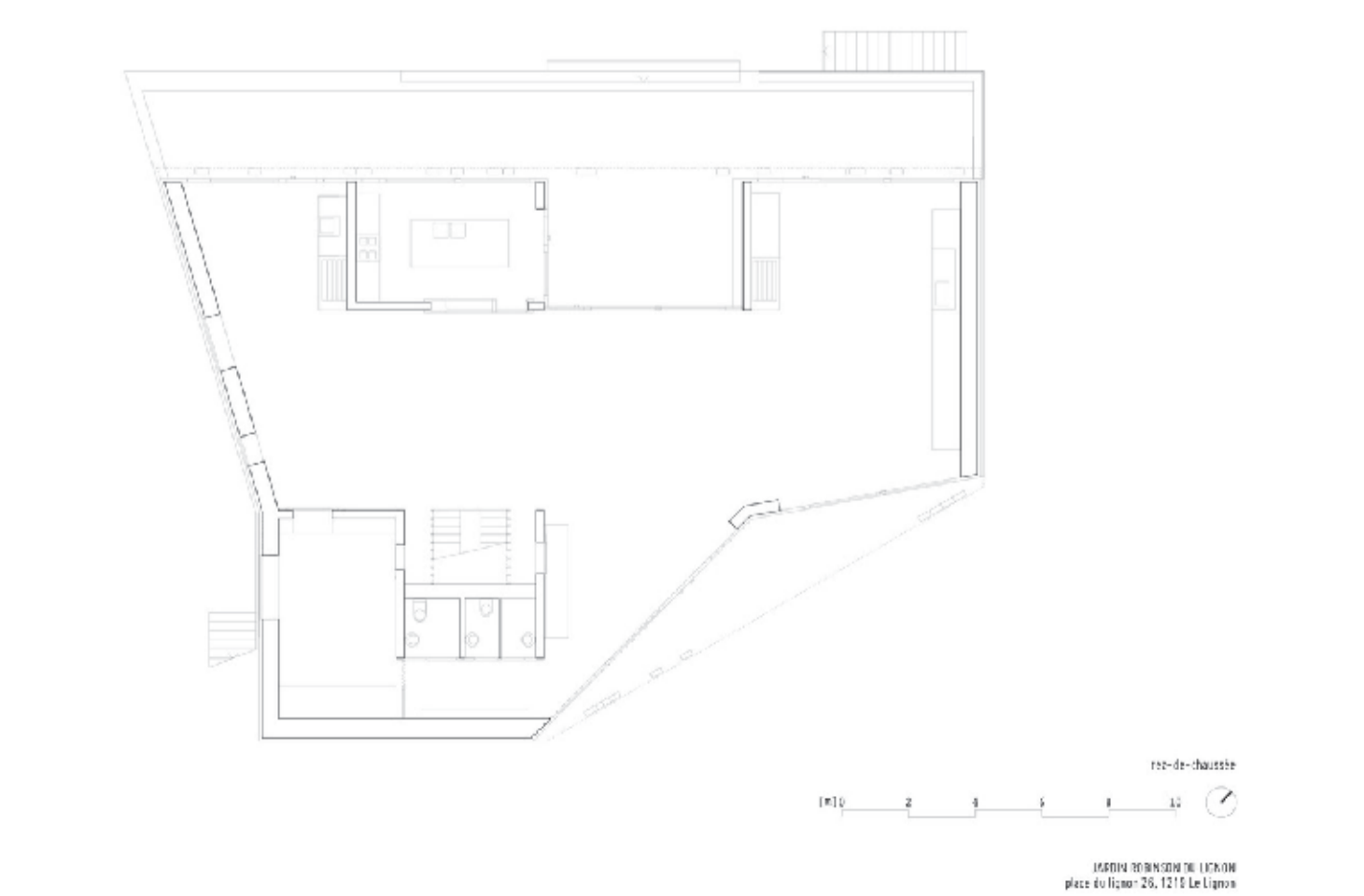




Name: Jardin Robinson du Lignon
Function: Recreational community center
Location: Vernier, Switzerland
Area: 350 m2
Year: 2018
Architect: Stendaro Menningen Architectes

Characteristics:

- Form: large open room of a very particular shape. Certain parts of the space can be subdivided into smaller spaces. Rather low ceiling gives a cozy feeling.
- Color: the dominant colors are shades of grey, and beige. The lightness of colors is high and saturation low resulting in a muted interior with low energy. The contrasts of colors are low contributing to that effect.
- Lighting: the artificial indoor lighting is dominant over the natural light. The artificial lights are colder at approx. 6000K temperature. High intensity but sparse location creates contrast with light spots and dark corners.
- Material: the main materials are concrete and wood. The texture of concrete and its coldness contrast with the the warmth and the texture of the wood, however combined with the lighting the wood gets a colder expression resulting in the overall cold feeling of the space.
- Influence on attendance & involvement: the visual discomfort of the space may negatively affect both the attendance and involvement of the visitors. There is no seating in the space or any movable furniture which does not give people an option to stay in the community center for longer.



Name: Hindupara Integrated Community Center

Function: Community center

Location: Kutupalong, Bangladesh

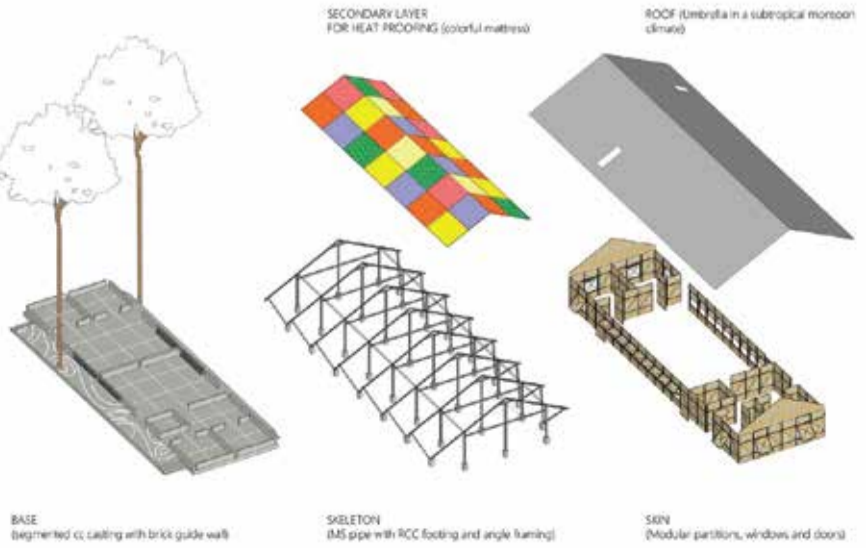
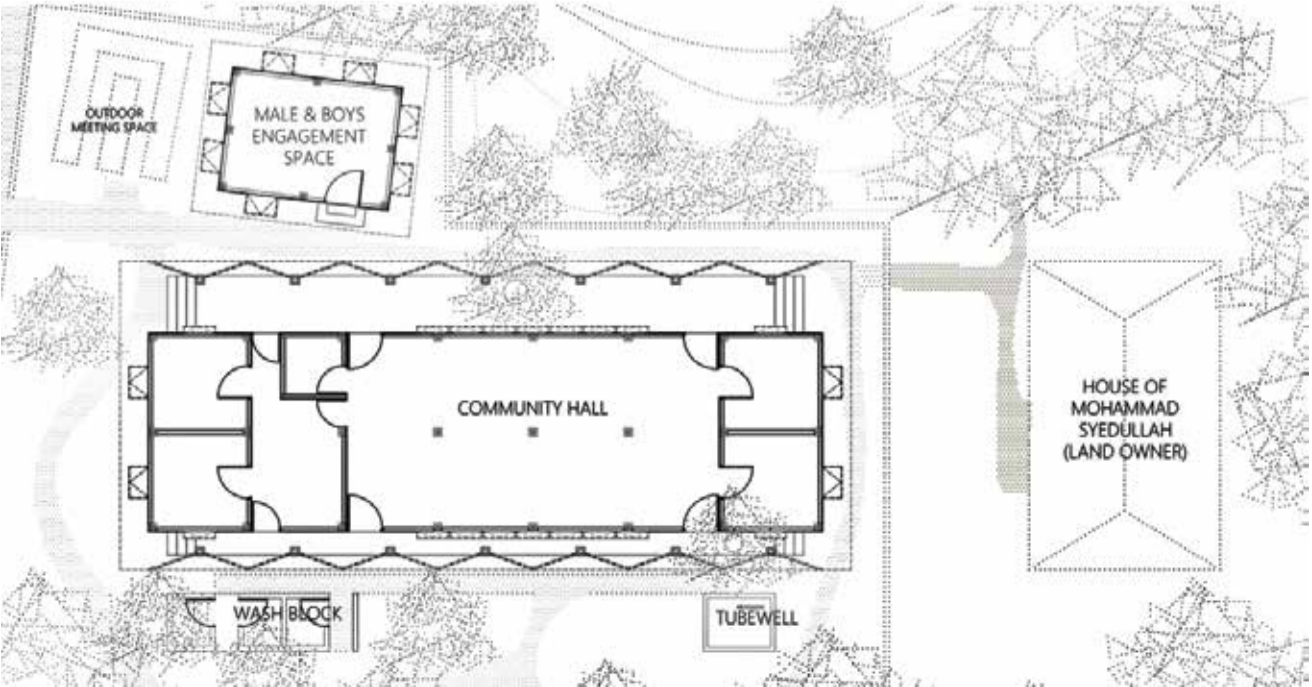
Area: 221 m2

Year: 2019

Architect: Rizvi Hassan

Characteristics:

- Form: simple form follows the shape of buildings traditional to the area. The ceiling is high in the larger, main hall making it feel more spacious and more appropriate for larger gatherings. The small meeting space created specifically for men and boys has a slightly lower ceiling creating a more intimate atmosphere.
- Color: the colors are very lively and intense. There is a variety of hues, saturation and contrast are high. The space seems vibrant and joyful.
- Lighting: there is a lot of natural light entering the space through large window openings. The space is well, uniformly lit, without excessive intensity or contrasts.
- Material: the colorful layer of textile applied on the ceiling for heat protection and the bamboo partition walls give a warmer expression to the space, while steel elements and concrete floor counter it with a cold feeling. This second effect is, however, reduced by application of colorful carpets on the ground. This suggests that the “cold effect” is not intended and welcome in this space.
- Influence on attendance & involvement: the center’s only function is providing a space for workshops, therefore the attendance outside of the organized activities might not be high. There is little chairs and no tables in the main hall, however during the meetings the floor is covered with more carpets and also serves as a seating spot which may have an interesting effect on involvement, potentially improving it by forcing a more active position of a body.





Name: Common Space
Function: Community center
Location: Foshan, China
Area: 130 m2
Year: 2022
Architect: NEME Studio Architects

- Characteristics:*
- Form: a simple square shaped space of medium to small size. Consists of just one meeting/performance/workshop room. High ceiling makes it seem more spacious.
 - Color: the color lightness is moderate with dominant shades of brown and grey. Saturation is low for majority of the space but the contrasting black elements make the space more interesting. Despite low saturation the walls look somewhat warm.
 - Lighting: the space is uniformly, well lit with natural light through the clerestory windows. The intensity is balanced. The artificial lighting is identical temperature to natural light approx. 5000K. There is a contrast between the light spot and dark corners, justified in this case as the light is focused on the scene rather than audience.
 - Material: the thick and heavy brick walls, the plexiglass windows and concrete floor all give a cold feeling of the space. Yet, that coldness is in some way comforting, probably thanks to the warm shade of brick and rich natural lighting which balance the atmosphere out. The half meter thick walls also give an impression of safety when inside.
 - Influence on attendance & involvement: the thickness of the walls from the outside and a lack of door in the front facade, on the other hand, gives a feeling of unavailability and may negatively affect the attendance. The minimalism of the interior may minimize distraction during community activities and increase involvement.

