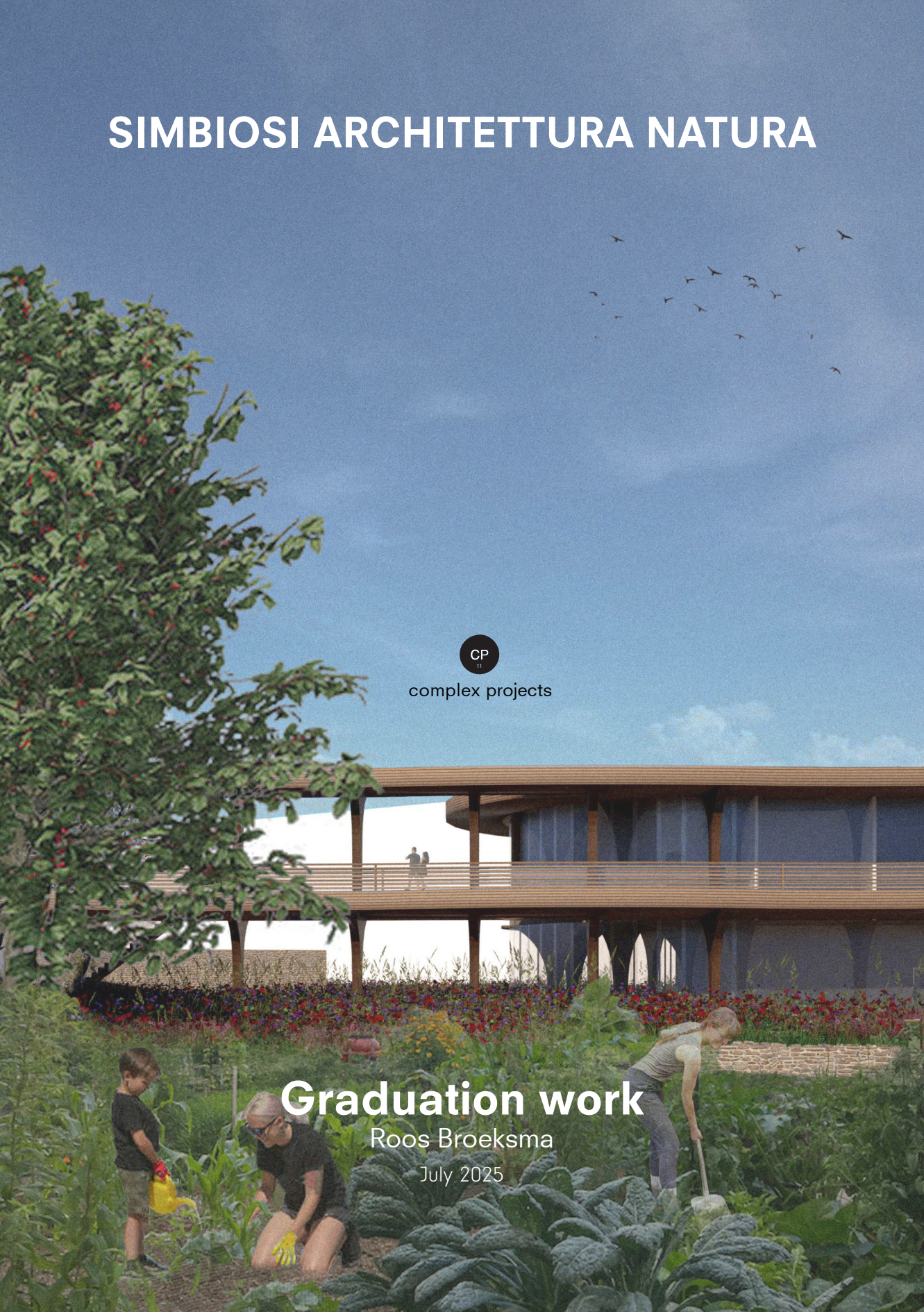
SIMBIOSI ARCHITETTURA NATURA



complex projects

Graduation work

Roos Broeksma

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TU Delft

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2025

COMPLEX PROJECTS
Bodies and Building Milan
AR3A010 (Research plan)
AR3CP010 (Complex projects MSC3)

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Key words
Symbiotic architecture, Milan, Biophilic architecture, user experience

SIMBIOSI ARCHITETTURA NATURA

"A green oasis sheltered in between the hardened and polluted city"

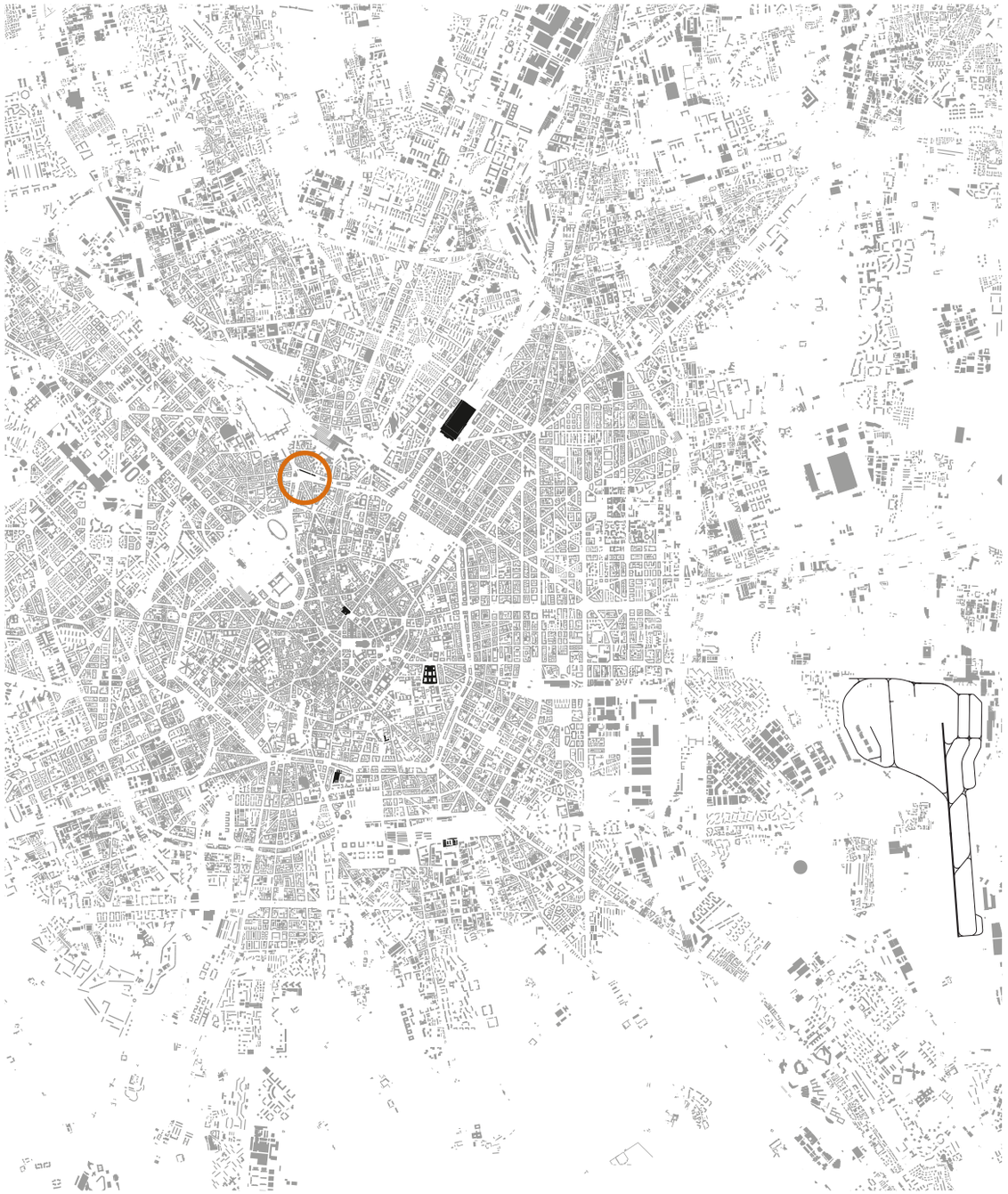

Figure 1: Line map of Milan with highlighted buildings, assigned student building marked with orange.

The interest of public buildings has always been there for me since this is a place where a lot of people gather and it should make all these people feel welcome. In the complex graduation studio one of the themes is generic vs. specific and I find this theme interesting because a building should be as generic to let a lot of people feel welcome, but at the same time be as specific to make them feel welcome. This is something that I wanted to investigate. At the same time this studio let's people pick their own research topic freely, which was perfect since I want to do research into symbiotic architecture.

Every student within the graduation studio gets an assigned building type During the project the students are first analysing the existing building in terms of client, program and site and adapting it to make it their own and suitable to their lens and chosen thesis topic. During the second phase of the graduation topic MSC4 the students can pretend that the existing building was never built and can design according to the out together design brief of MSC3.

In this case the design assignment will be a library (office and museum) for Fondazione Feltrinelli (Microsoft office and the ministry of culture) on the circled in orange location in Porta Volta/Porta Garibaldi. The site is a narrow one located on the border of the mentioned neighbourhoods and hold archaeological remains of the Spanish walls that used to be there. It is located on the north side of the city centre.

In this booklet the site, program, client and thesis topic will be further investigated and developed into a design brief.

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INTRODUCTION

01

Personal fascination and thesis topic

For the graduation studio of Complex Projects at the TU Delft a library, office and museum in Milan have to be designed for an already appointed site (located in Porta Volta) and clients: Fondazione Feltrinelli, Microsoft office and the ministry of culture Milan. Throughout the graduation studio different topics must be researched by students: the clients, site and program, but also a lens. In this case the lens is culture. A design must be made based on these factors, but also based on a chosen research topic by the students.
Green architecture is something that I find interesting, because it can make multiple types of people feel at home and therefore bring people together. It can also help to resolve problems in cities like pollution, heat and health problems. This thesis will focus on these abilities of greenery and how it can improve the quality of a library and office in Milan.
In the second quarter the research into this theme will be done according to this research plan. At the same time the design brief of the site, clients and program will be further elaborated, and all of this input together will be used in the design process.

Figure 2: Green public architecture: the building as a green environment (Jacques Ferrier chartier dalix architectes).

Problem statement

Milan is the second biggest city in Italy and is known for design, fashion, art, economy, food, architecture and more. The city has approximately 1,4 million residents. Not only the residents use the city, but annually about 8.5 million people visit Milan (Road genius, 2024). This number is expected to grow even more in the upcoming years. The crowdedness together with the city mostly existing out of hardened materials leads to a lot of pollution (Girardi, 2019). In February 2024 Milan briefly was the third polluted city in the world (Giuffrida, 2024). At the same time Milan is heating up with 41% of the city being covered in 'heat islands' (Telespazio, 2020). This all can lead to serious health problems, Giuffrida (2024) states the following: "Poor air quality was linked to 50,303 premature deaths in Italy in 2020, according to the EEA. Most were in Milan, but Cremona in Lombardy was the Italian province with the highest proportion of deaths – between 150 and 200 per 100,000 residents – attributed to PM 2.5".

Greenery can be a solution to these problems since it can clean the air and help reduce heat and so more urban nature is needed in the city of Milan.

Figure 3: Collage of the problem with problem statement.

Research question

Cities are growing and nature is lacking in and around buildings. This causes environmental problems, and the city of Milan wants to go green by using buildings to increase the amount of urban nature. In this study the following research question will be answered to gather information about how this goal can be achieved:

"How can a symbiosis between a building and greenery be designed for Fondazione Feltrinelli, Microsoft office, and the Ministry of Culture in Milan to enhance environmental sustainability and user experience in office and library spaces?"

Sub questions

To be able to give an answer to the research question, the following sub questions will be researched:

- Which architectural and landscape design strategies can improve a symbiosis between a building and green in the design for Fondazione Feltrinelli, Microsoft office and the ministry of culture Milan?
- How can the design of a biophilic building contribute to the energy efficiency and environmental characteristics of the building?
- Which green systems are the most fitting within the context of a library, office and museum for Fondazione Feltrinelli, Microsoft office and the ministry of culture Milan?
- How does the symbiosis with greenery add to the well-being and user experience of users in offices and libraries?

Figure 4: Collage of the research goal.

Theoretical framework

A symbiosis between architecture and nature

A symbiosis means a relationship that benefits both parties involved, so in this case architecture benefits from its natural environment and the natural environment benefits from architecture. "Symbiotic architecture takes into account the site-specific conditions and natural systems, such as the climate, topography, vegetation, and wildlife, and uses them as inspiration for the design. The goal is to create a building that not only minimizes its impact on the environment but also enhances its ecological function." (Smart cities, 2023). Symbiotic architecture can be achieved by implementing green walls, green roofs, indoor gardens and other elements of biophilic design, but also by using natural ventilation and optimizing natural light and rainwater.

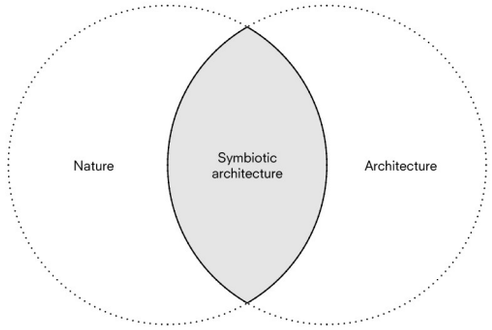


Figure 5: A symbiosis between architecture and nature.

Biophilic design

Biophilic design is a way of designing by incorporating nature into architecture to enhance the affinity people have with nature. Almusaed (2011) describes it as: "Biophilic architecture is a part of an innovative view in architecture, where nature, life and architectural conjecture merge to create a lively habitable edifice fit to satisfy the demands, restrictions and respect for both people and the environment."

There are different design strategies to biophilic design: Kellert (2018) states the following design principles for biophilic design: "Biophilic design creates interrelated and integrated settings where the ecological whole is experienced more than its individual parts." And "Biophilic design occurs in a multiplicity of settings, including interior, exterior, and transitional paces and landscapes.". In order to create a functional biophilic design, an environment should be designed and not only stand-alone elements like plants: "Rather than simply inserting nature into the built environment, these principles of biophilic design reflect the understanding that humans evolved in adaptive response to nature, and this knowledge can be used to design buildings and landscapes that advance people's health and productivity." (Kellert, 2018).

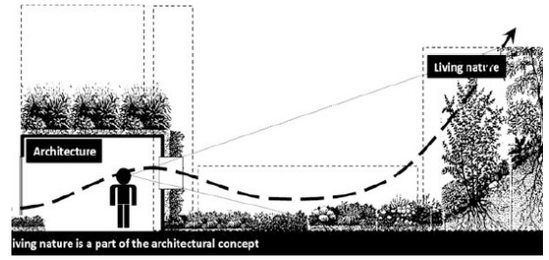


Figure 6: Biophilic design by Biophilic and Bioclimatic Architecture by Almusaed, A. (2011).

Nature and its influence on user experience and well-being

User experience is a combination of look, feel and usability. Green in and around buildings can change the look and feel and even make the usability more pleasant due to the improvement of environmental characters. The presence of nature in the built environment has multiple benefits, it can reduce stress, enhance productivity and improve one's state of mind (Al-Kodmany, 2023).
Professor Ming Kuo found that "access to green space decreases aggression and attention deficit hyperactivity disorder symptoms. It also boosts the immune system." (rachelcarsoncouncil, n.d.). A study conducted by Fleming, Rizowy, and Shwartz (2024) shows that people who focused more on green elements had a better mood and less anxiety than people who did not focus on green. Well-being is a combination of psychological, emotional, physical and social factors. The different researches all show that greenery in and around buildings can improve all of these factors. Nature therefore has a positive influence on well-being and a better user experience.

Theoretical framework

Greenery in Milan

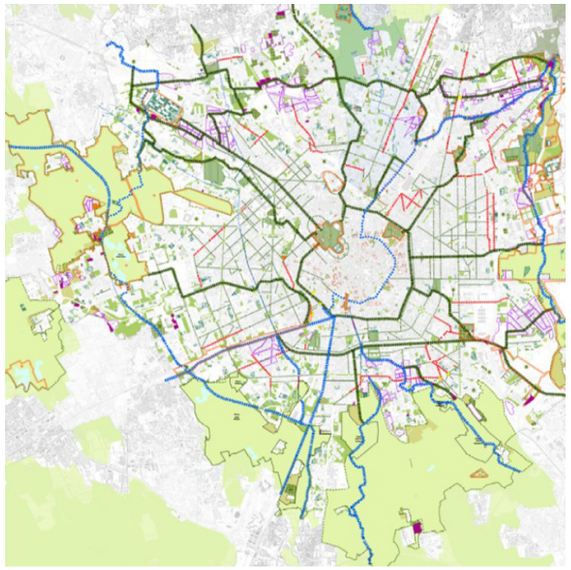
Milan is known as a hard city with a lot of pollution and to change this. Local authorities have announced plans to plant 3 million trees by 2030, believing that the increase in greenery will have a positive effect on the quality of air, and consequently on the health of the people." (Girardi, 2019). To achieve this goal, they want to use urban areas, but also buildings by "transforming courtyards, streets, squares, rooftops into healthy, fresh, quality, living spaces" (CDP, n.d.).
The city wants to create a 'green belt' that connects the parks and becomes an urban threshold (DP Città Resilienti, Direzione Transizione Ambientale, Commune di Milano). For this network existing green linear connections are important (see pictured bellow) One of these existing green connections is located at the site of the assigned plot.

Use streets, squares, courtyards, roofs, façades and parks for green implementation

Plant 3 million trees by 2030

Improve the quality of life of its 1.4 million citizens

Figure 7: Goals of Milan going green.



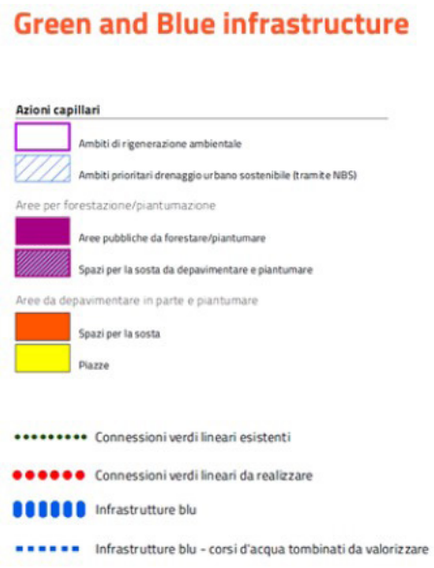


Figure 8: Green and blue infrastructure.

Relevance of the topic

Since Milan is the most polluted city in all of Europe the city wants to change this and make the city greener and improve the quality of life: "The city is "going green" in a major way to fight against climate change and improve the quality of life of its 1.4 million citizens.

Research methods

A lens analysis
During the first quarter of the graduation studio a lens study will be conducted by a group of 8 studio's in order to gain information about Milan, in this case about the culture. The different students will each look upon what culture means for their building types and look at the overlapping themes. These themes are researched then. Following this one conclusion will be drawn and upon this conclusion a group strategy will be chosen.

Program analysis
The drawings of HerzogdeMeuron (of the existing buildings) are used to analyse the existing building to gather insights into the program & the relations between the functions.

Literature study
To gather information about the influence of greenery on cognitive performance, well-being mostly scientific papers will be used. To locate these papers Google Scholar will be used as well as ResearchGate, ScienceDirect and the library of TU Delft. Through the library of TU Delft books will be searched.

The books "Nature by design" by Stephen R. Kellert and "Building urban nature" by Jacques Vink, Piet Vollaard and Niels de Zwarte form an important base for the research and will be conducted for insights about the why and how of nature inclusive design.

Site analysis
Between the 18th and 24th of November 2024 there will be a trip to Milan. This is meant to give insights and understanding the site and culture of Milan and the surroundings of the appointed location, but also to visit the existing building to get a grip on the program. Other than that, there will be mapping done of the site to gain information about the surroundings, and ways of entrance. Desk research will be done to gather information about the neighbourhood.

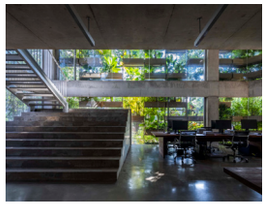
Client analysis
Desk research will be done to get to know more about the clients and their wishes. Additionally, interviews will be conducted to get insights into the wishes of the clients for the design of the building.

Case study
Different case studies will be done in order to take inspiration and learn from others about how to combine greenery and architecture, and also to see how different green elements can be technically designed. The Kengo Kuma office of the future, Joint research centre by Mecanoo, the Shared Education Building by OXO architects, the Primary School For Sciences And Biodiversity by Chartier Dalix Architectes and Vo Trong Nghia Architects 'Urban farming office' will be used for the case study.

Office of the future by Kengo Kuma

Joint research centre by Mecanoo

Shared Education Building by OXO architects


Urban farming office by VTN Architects

The School For Sciences And Biodiversity by Chartier Dalix Architectes

Diagram of research

The research will take place in different steps that sometimes follow up one another, but also happen simultaneously; the whole process is an iterative process. The diagram of research pictures which steps will be taken, when they are expected to take place and how these lead to chain points and eventually to an endpoint: final design.

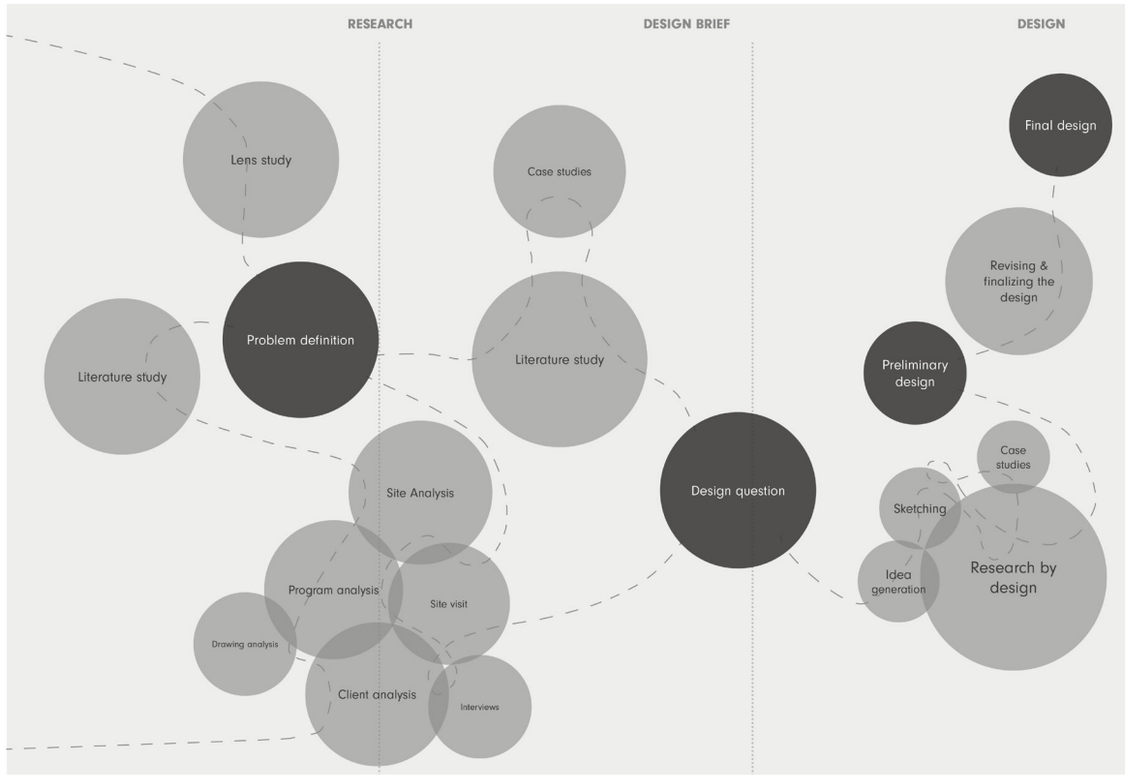


Figure 9: Diagram of research.

DESIGN BRIEF
(INCLUDING RESEARCH)

02

Client

Overview of the clients

The current clients of the existing building are the publishing company Fondazione Feltrinelli that hosts their headquarters here. Microsoft Office has their Italian headquarters in the building: Microsoft house (with showrooms, classrooms and technology centres) to contribute technology to the vibrant Milanese economic culture.

The ministry holds their museum of the Italian resistance in the building.

These three clients are the original clients of the project, but during the site visit it was discovered that there are currently two more clients (located in the Microsoft office building): Unifor & Cassa Gruppo Centrale. Since these clients were not in the original client base/ design brief, these will not be included in the design brief for the new design.

Other clients that can add to a cohesion in the project and could be interested in the project are the municipality of Milan and UNESCO city of literature. They will be added to the client list.

An overview of the client list can be seen in on the right with the grey ones being removed.

Fondazione Feltrinelli | headquarters

Microsoft office | Microsoft house

Ministry of culture | museum of resistance

Unifor | showroom

Gruppo Cassa Centrale | offices

Municipality of Milan

Unesco city of literature

The ambitions of the clients

All clients have their own ambitions and these will be highlighted using statements from their own websites and the importance of these will be highlighted. These together will be combined into one ambition for the whole building.

Fondazione Feltrinelli

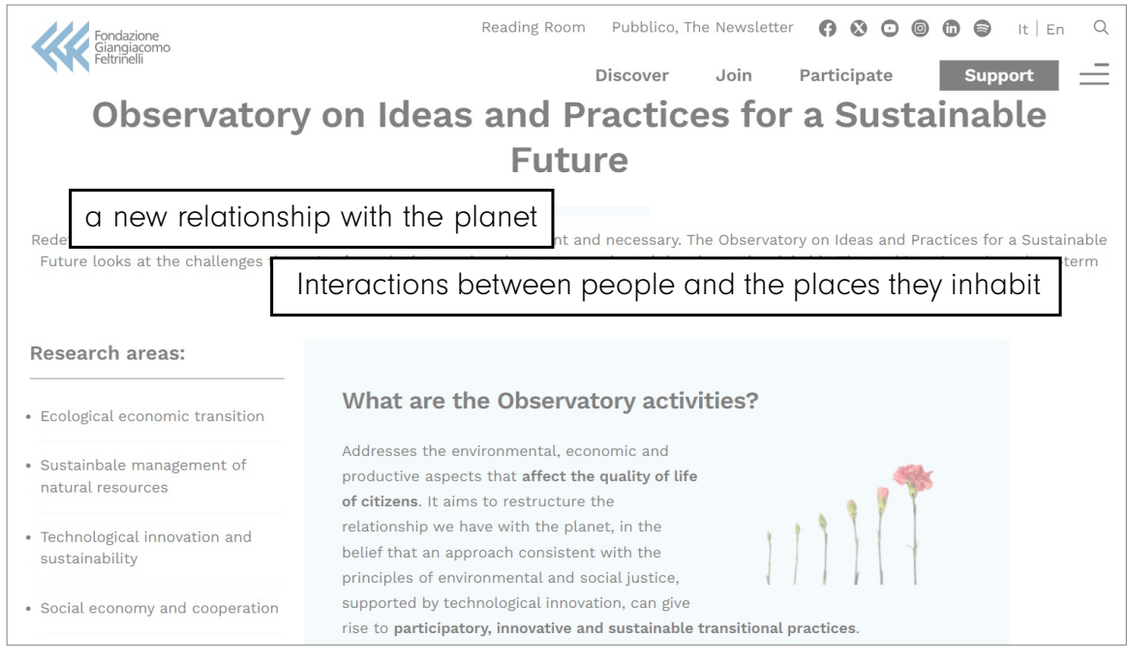


Figure 10: The ambitions of Fondazione Feltrinelli.

Feltrinelli wants to create a new relationship with the planet and interactions between people and the places they inhabit. They even have a observatory on ideas and practices for a sustainable future.

Client

Microsoft office

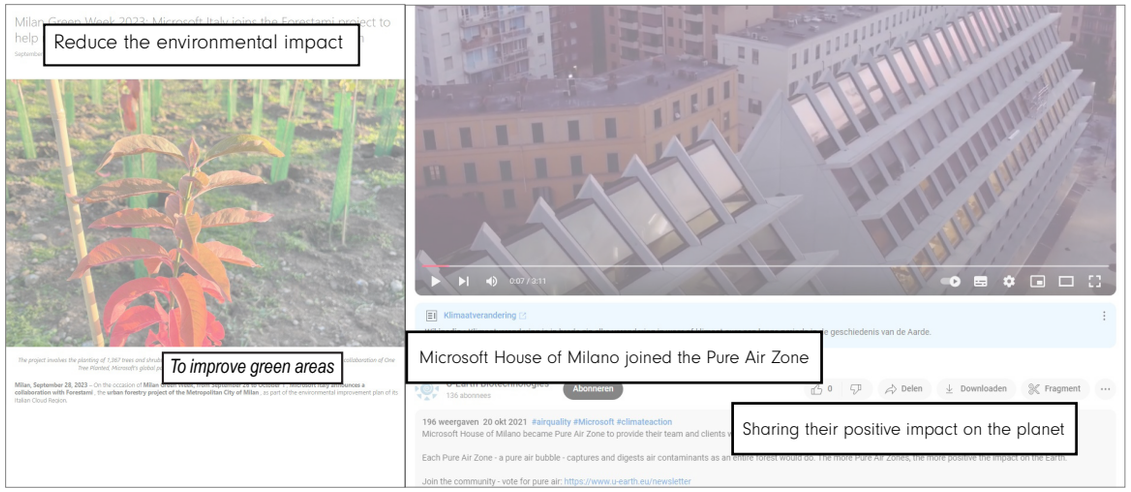


Figure 11: The ambitions of Microsoft Office.

Microsoft office wants to reduce the environmental impact of their cloud region, improve green areas, purify the air and have a positive impact on the planet.

Ministry of culture

Figure 12: The ambitions of the ministry of culture.

They want to create awareness for historical struggles of Italy to broader audiences, especially the youth.

Municipality of Milan

Figure 13: The ambitions of the municipality of Milan.

Creating more public spaces where people can meet and give citizens more liveable squares and public spaces.

UNESCO city of literature

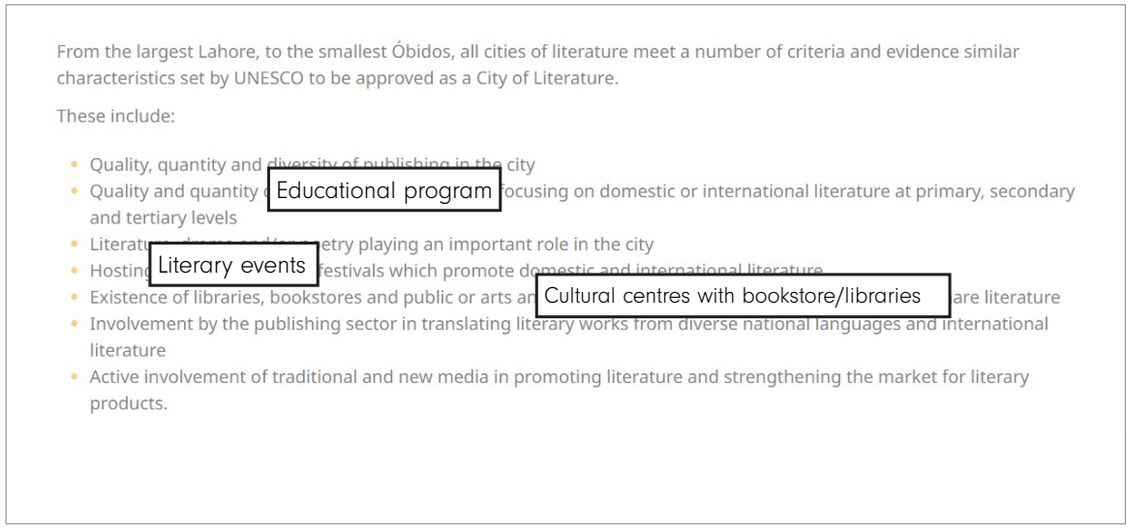


Figure 14: The ambitions of the UNESCO city of literature.

The UNESCO city of literature wants to have cultural centres with bookstore/libraries that have educational programs and can host literary events.

Client

Combining the ambitions of the clients

In the pages before it can be seen that the ambitions of the clients are:

- A sustainable future.
- To create a new relationship with the planet.
- Let people interact with the places they inhabit.
- Creating places where people can meet.
- Sharing knowledge (about history).

When combining these ambitions the shared ambition results in creating the green knowledge hub of the future.

Figure 15: Shared ambition: green knowledge hub of the future.

Adding to the culture of Milan (lens)

During the group research (Appendix 2) of the lens Culture the aim was to find out what Milan is known for. This resulted in Milan as the city of:

- Literature
- Fashion
- Design
- Economy
- Art & architecture
- Sports

This can be seen in figure 16.

Figure 16: The current culture of Milan and what it is known for.

The group research also states that Milan shows it's culture through events and therefore an event calendar was made that shows which events of which category take place when and where per month (Appendix 3). An overview can be seen in figure 17.

When adding a green knowledge hub to the city this can be a start in adding to the culture and making Milan a city of Green initiatives (figure 18), before it was known as one of the most polluted cities in Europe, but this can be changed by exchanging and promoting green initiatives. Events can be held for knowledge exchange and community involvement and with that another category can be added to the event calendar with the hub being the centre point (figure 19).

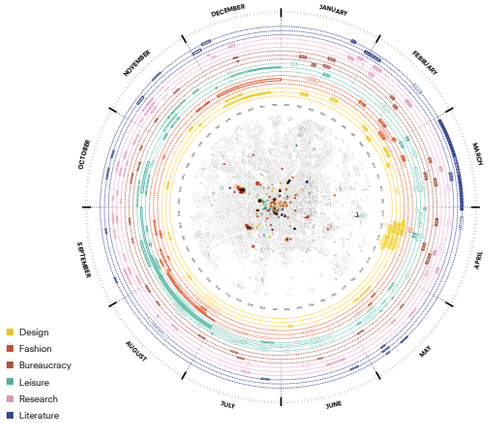


Figure 17: The current event calendar of Milan.

Figure 18: The addition to the culture of Milan and what it is known for.

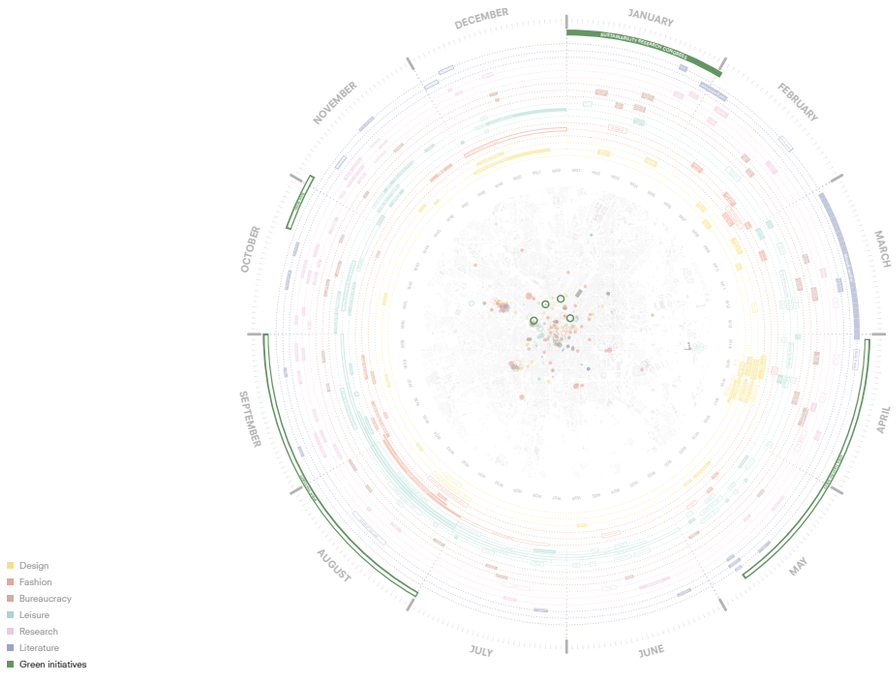


Figure 19: An indication of possible new events in the event calendar of Milan.

Client

Adding another client: UNESCO green citizens

When becoming a city of green initiatives another possible client is UNESCO green citizens projects. Their ambitions can be seen in figure 20.

Unesco green citizens

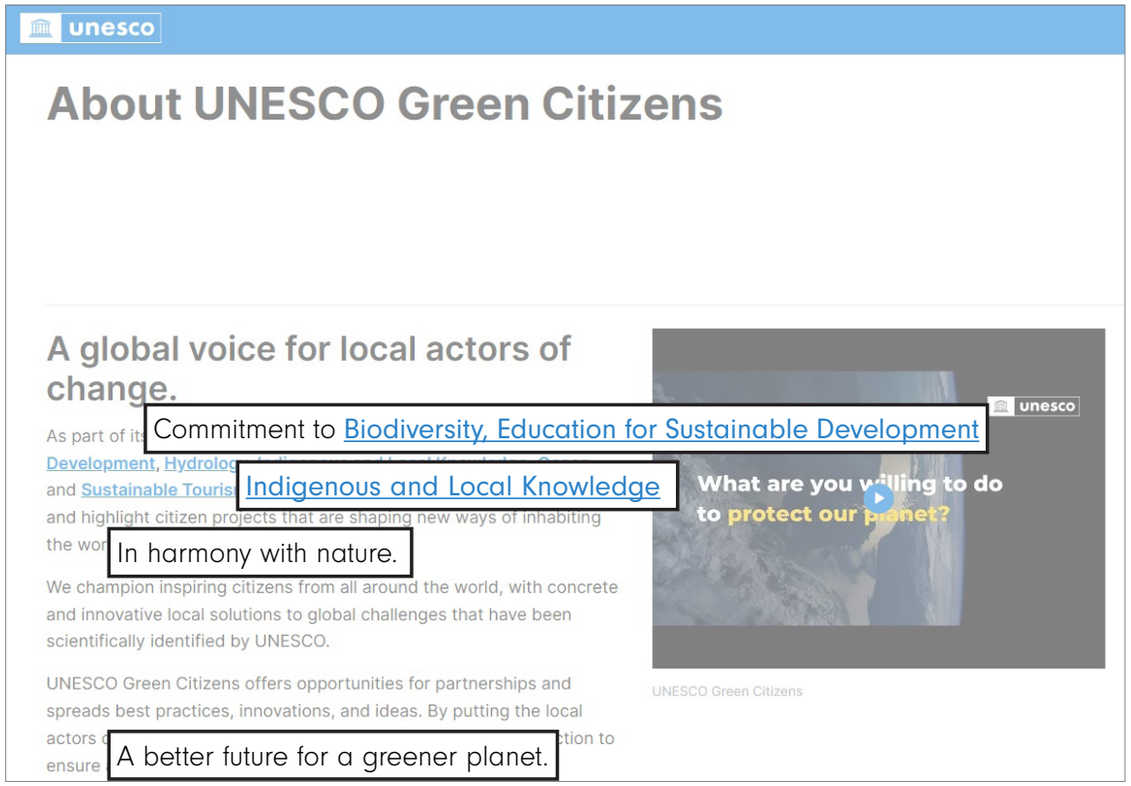


Figure 20: The ambitions of UNESCO green citizens.

UNESCO green citizens wants commitment to biodiversity, education for sustainable development, indigenous and local knowledge, harmony with nature and a better future for a greener planet.

Requirements for the UNESCO green citizens project

To be able to involve the wishes of the green citizens project community involvement is needed and to share indigenous and local knowledge exchange of knowledge is needed about locally known greenery.

Creating community involvement

Exchanging knowledge about sustainability.

Using locally known greenery.

Requirements for accessible greenery for all

In order for everyone to feel free to join in on and learn about the greenery the systems should be easy to maintain so that the citizens can do it/ help with it.

This can be achieved by having no complicated technical systems (since these can be expensive and hard to fix), using ground bounded greenery (either on ground level or heightened) that can store excessive water for later in the ground and using manually water-able plants so that everyone can contribute.

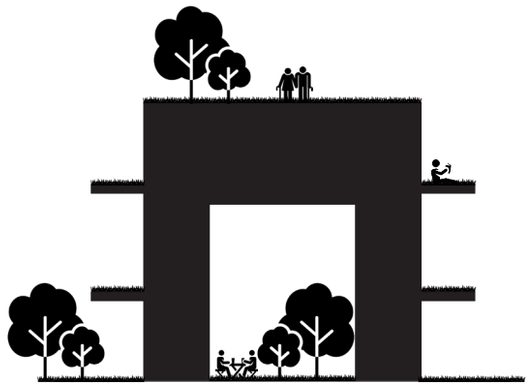
Creating No complicated technical systems

Ground-bounded green with soil

Manually water-able plants

Requirements for public gathering

To create public gathering in and around the building all outdoor greenery should be publicly accessible and use-able. How to create such roofs/balconies is shown in the thesis (symbiotic architecture) sub chapter.



All outdoor greenery should be publicly accessible and usable.

Client

The users of the building
Besides the clients there are also the users of the building in this case staff, students and residents of the neighbourhood who come to work, network, study, collaborate and recreate.

For these users a good user experience is of essence and nature inclusive design can help improve user experience and well-being by reducing stress, improving cognitive performance and improving emotion, mood & preference.

Staff

Students

Residents of the neighbourhood.

Requirements for a positive user experience
To reach these positive influences the patterns of biophilic design can be used. More information about how this works can be seen in the sub chapter of the thesis topic.

The requirements of these positive influences are the following:

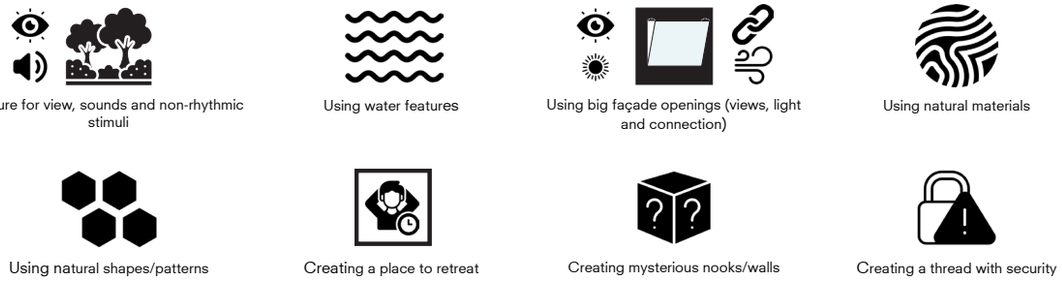


Figure 21: The 14 patterns of biophilic design (Terrapin Bright Green, 2024).

To be used requirements
To be able to create a symbiosis between architecture and greenery only the direct links to nature are essential like sight, sound, materiality and patterns and so the patterns of mystery and thread with security do not have to be implemented. Retreat will have to be used for the public gathering.

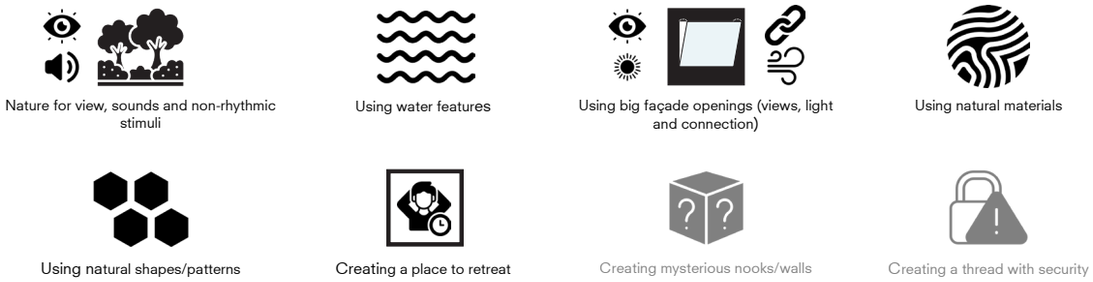


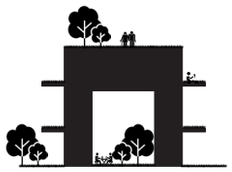
Figure 22: The to be used patterns of biophilic design (Terrapin Bright Green, 2024) (in grey do not have to be used).

Client conclusions

Creating the green knowledge hub of the future

- Becoming a **UNESCO green citizens city.**
- Involving citizens & exchanging knowledge about greenery.
- No complicated systems.
- Ground bounded greenery.
- Manually water-able greenery.

All outdoor green publicly usable



- All outdoor greenery should be **publicly accessible** and usable.

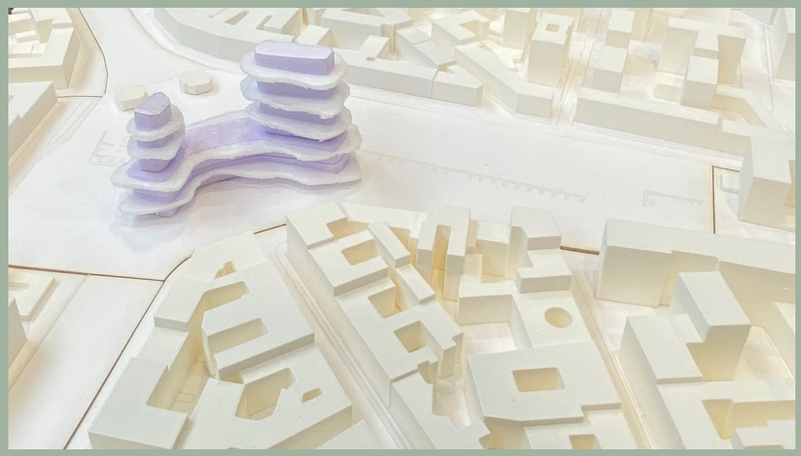
Using the patterns of biophilic design

Using the 14 patterns of biophilic design.

- Having views on nature.
- Implementing water features.
- Using natural materials.
- Creating openings/ transitions towards nature.
- Using natural patterns/ shapes.

Client massing models

Client | A | Terraces same m2 as building



Client | B | Terrace building with organic forms

Client | C | Green heart within the building forms

Program

Changing the building type

The current building type is a library, but as argued in the client sub chapter the building type will change into a green knowledge hub for this the current program needs to change. In this sub chapter these changes will be elaborated.

The current program and removing from it

The current program consists of the library for Fondazione Feltrinelli, Microsoft House for Microsoft Office, a Museum, a Unifor showroom and Gruppo Cassa Centrale, but like discussed in the client chapter Unifor and Cassa Gruppo Centrale will be removed.

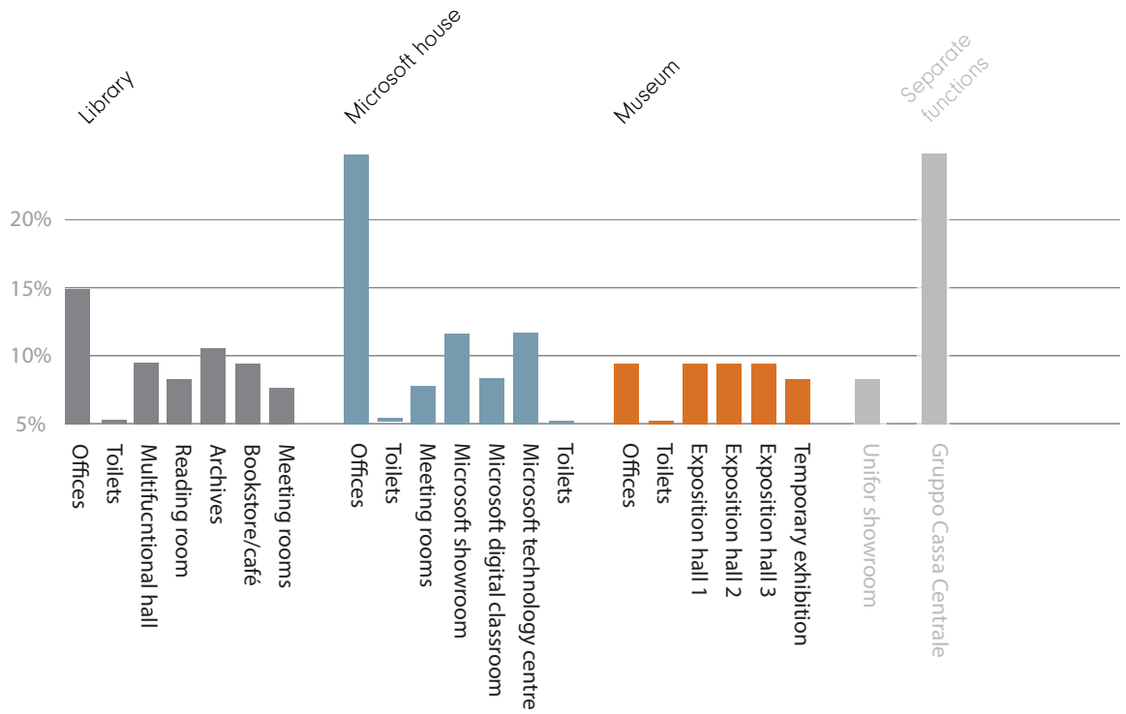
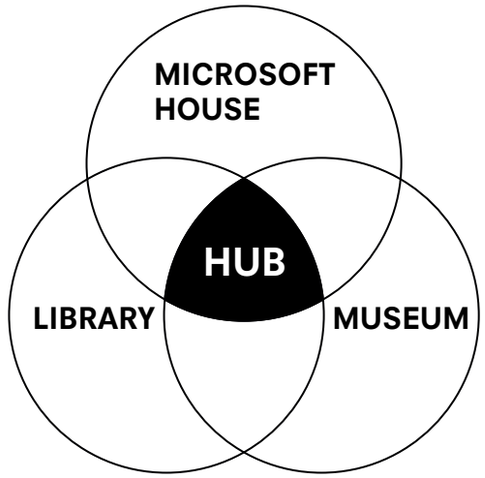


Figure 23: The current program (grey will be removed).

Clustering and combining functions

To create a knowledge hub; “a centre or focal point for the exchange of knowledge, support, development and ideas”, some of the functions of the program will be combined and shared to strengthen each other.

The publicly accessible space will be picked and clustered together to achieve this goal (figure 24 & 25).



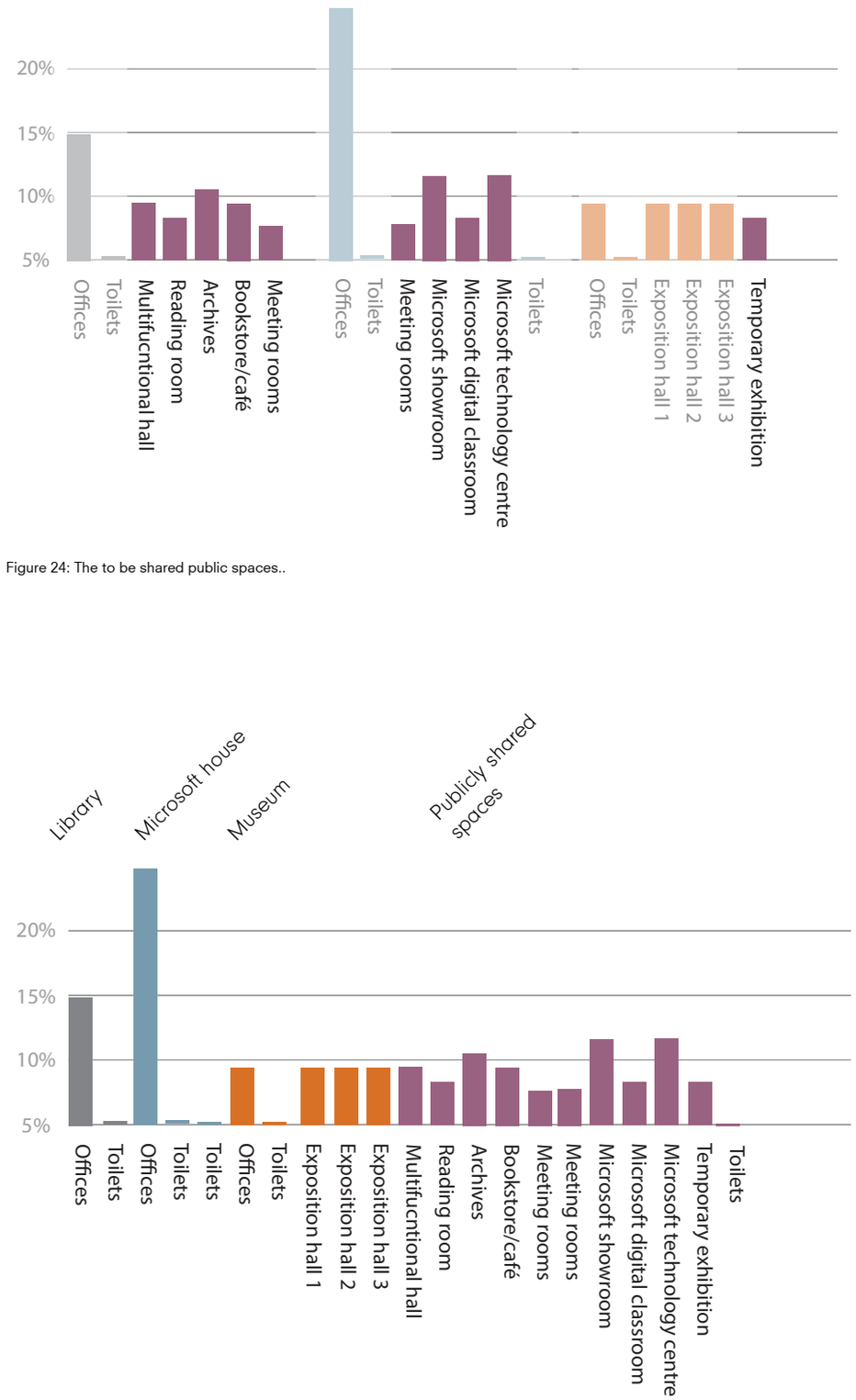


Figure 24: The to be shared public spaces..

Figure 25: The public spaces clustered together.

Program

Adding spaces

In order to make the building optimally functional new programmatic spaces need to be added. The first addition being **a green atrium**: a place where sustainable initiatives can be held like the green events and where citizens can be involved with the greenery. This space can connect the building functions and tie everything together.

Another addition is more **study space**. During the site visit it was noticed that the current study area in the reading room and the café were fully occupied (figure 26 & 27) and you even have to make reservations on time for the reading room and so more study space is needed.

Since the building is focussed on knowledge exchange and so learning indoor greenery will also be added to emphasize the symbiosis and because "Nature may promote learning by improving learners' attention, levels of stress, self-discipline, interest and enjoyment in learning, and physical activity and fitness" (Kuo, Barnes, & Jordan, 2019). And so in the rooms that are focussed on learning **indoor greenery** will be added as well.

An overview of the additions can be seen in figure 28.

Figure 26: The fully occupied reading room during the site visit.

Figure 27: The fully occupied bookstore/café during the site visit.

Requirements per room

Every room has different requirements and these are important for the design. A lot of the rooms will have indoor greenery like mentioned before with the exception of the archives, since these need a stability of 20 degrees and 30% humidity. The exhibition halls will not have indoor greenery either, since the main focus needs to be on the to be exhibited pieces. The reading room, meeting rooms, classroom, technology centre, showroom, bookstore/café and study spaces will have 12% indoor greenery because "12% green coverage ratio as the optimal greenery dose for the office after integrating the results on psychological, physiological, and productivity performance." (Jiang, Song, Xian Li, Siu-Yu Lau, & Lei, 2020). These rooms also require sight on outdoor green. For the showroom and bookstore/café a separate entrance is necessary. The study space needs consultation area, quiet area and general study area.

For the amount of indoor greenery in the atrium and offices there are other rules:

- Green atrium: half of the space needs to be indoor green to have a equal division of architecture and nature
- The Feltrinelli offices: per 10 books 1 plant will be planted and with 200.000 books and 0,2 m2 per plant 400 m2 indoor green is the requirement.
- The Microsoft offices: Microsoft has planted 300 trees and shrubs elsewhere in Milan to make up for cloud region and so they will do the same in their building (75 trees and 225 shrubs) = 345 m2.
- The museum offices: Per every exhibited piece one plant will be planted. With 200.000 exhibited pieces 400 m2 indoor green is the requirement.

All the requirements can be seen in figure 29.

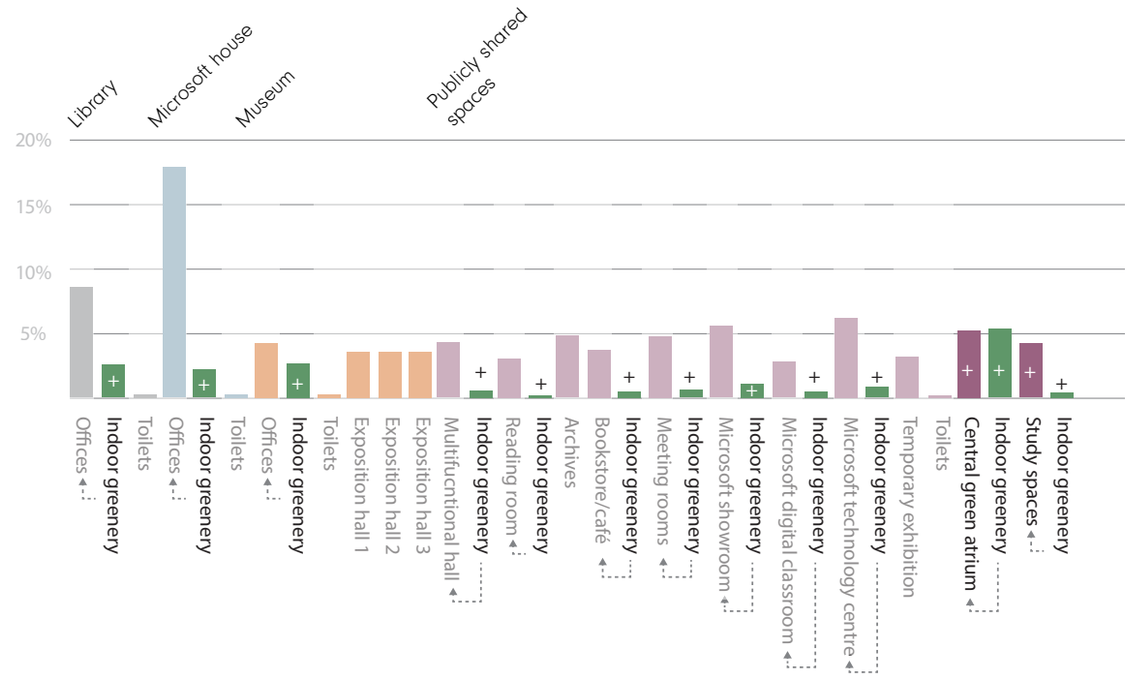


Figure 28: The overview of the program with the added spaces.

Atrium

- 1600 m2 floor area
- (50%) greenery = 800 m2
- Open layout
- Sight on outdoor green
- Vertical transport

Archives

- 20 degrees and 30% humidity
- No indoor greenery
- Underground to maintain same temperature

Exhibition halls

- No indoor greenery (only focus on exhibition)
- Open floor plan
- On outdoor green

Reading room, Meeting rooms, Classroom, technology centre

- + 12% indoor greenery
- Sight on outdoor green

Microsoft showroom & bookstore/café

- + 12% indoor greenery
- Sight on outdoor green
- Own entrance

Study spaces

- + 12 % Indoor greenery
- Sight on outdoor green
- 25 % consultation area
- 25% quiet area
- 50% general study area

Offices Feltrinelli

- Per 10 books 1 plant = + 400 m2 indoor greenery
- Sight on outdoor green
- Private

Offices Microsoft

- 75 trees and 225 shrubs = + 345 m2 indoor greenery
- Sight on outdoor green
- Private

Offices museum

- Per exhibited piece 1 plant = + 400 m2 indoor greenery
- Sight on outdoor green
- Private

Figure 29: The requirements per room.

Program

Program bar

When putting al the required spaces and the amount of square metres together a program bar is the result. This can be seen in figure 30.

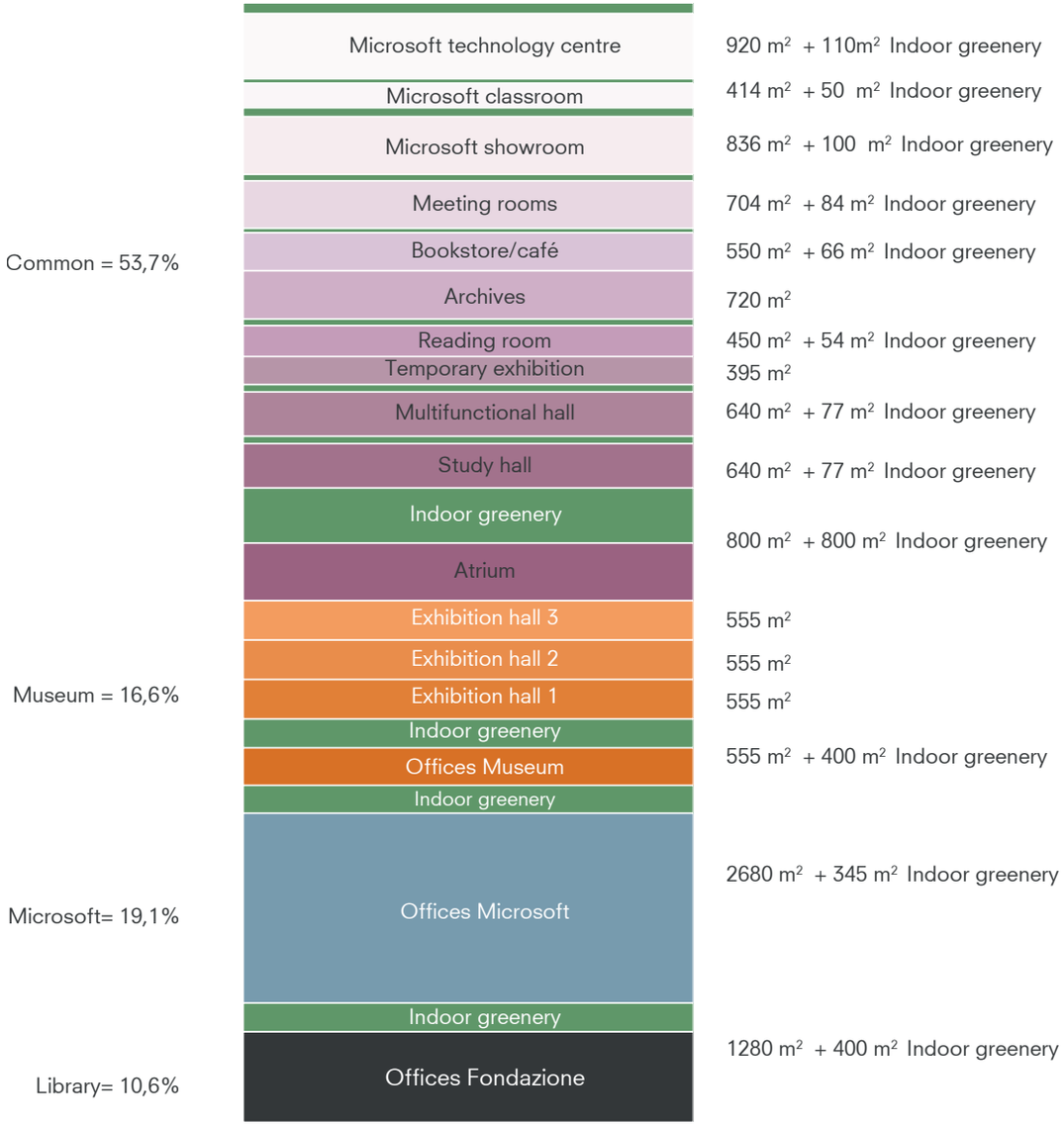


Figure 30: The program bar.

Relationship scheme

The way that the spaces are organised is also very important for the building. Like mentioned in the requirements some rooms need indoor green, some only need views on green, some need privacy and some need their own entrance. The publicly accessible and shareable functions are clustered together and the green atrium is the place that ties everything together to form a whole and give space for green initiative.

The offices need more privacy because of possible confidential information and so these are located separately from the main hall. The exhibition spaces are located near the green atrium, but not straight alongside it so that these have more space. In figure 31 the relationship scheme is a result of all these requirements.

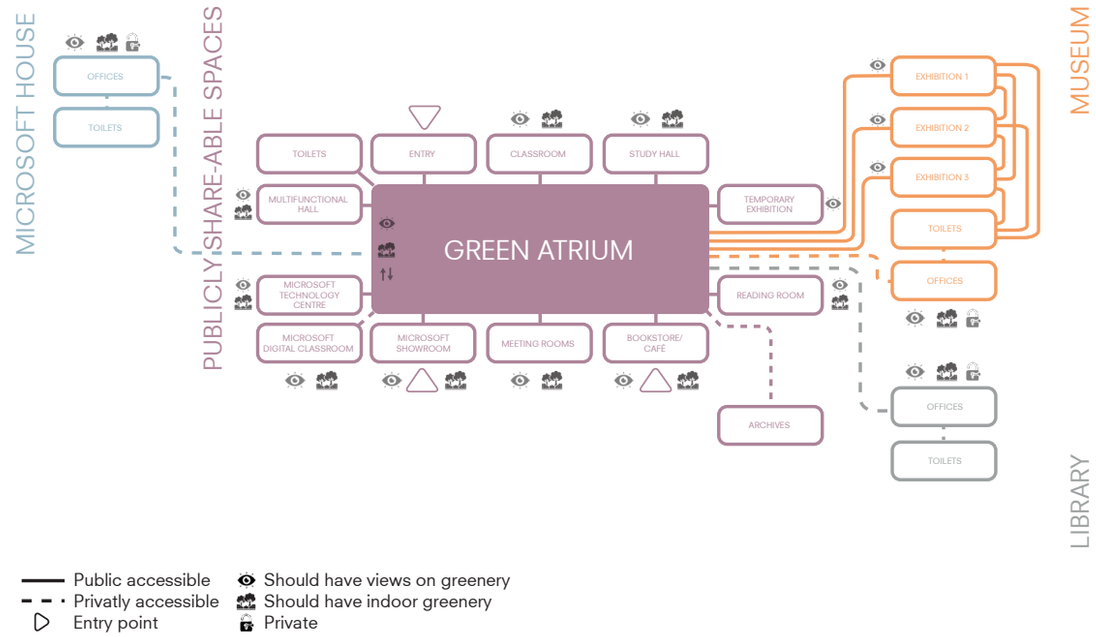
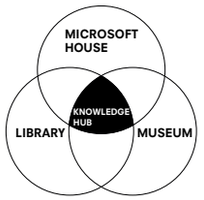


Figure 31: The relationship scheme.

Program conclusions

Combining publicly share-able functions

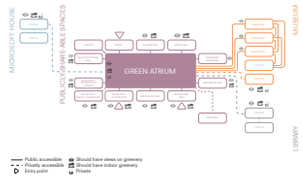


- Combining functions to strengthen them.
- Creating a centre for exchange of (green) knowledge.
- Adding a **study hall** and **green atrium** to the program.

Biophilic centre

- Adding a green atrium with 800 m^2 indoor greenery.
- Offices of fondazione and museum both have 400 m^2 indoor greenery.
- Office of Microsoft has 345 m^2 indoor greenery.
- Adding **12% indoor greenery** into all other knowledge orientated rooms.
- Almost all rooms have views on outdoor greenery.

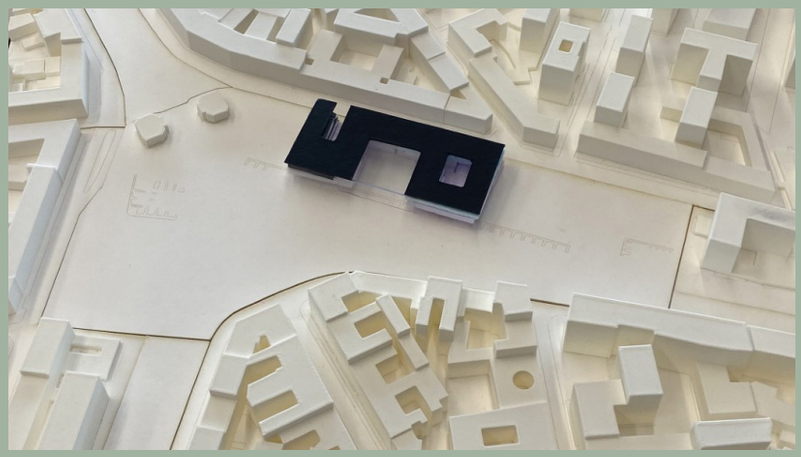
Programmatic relations



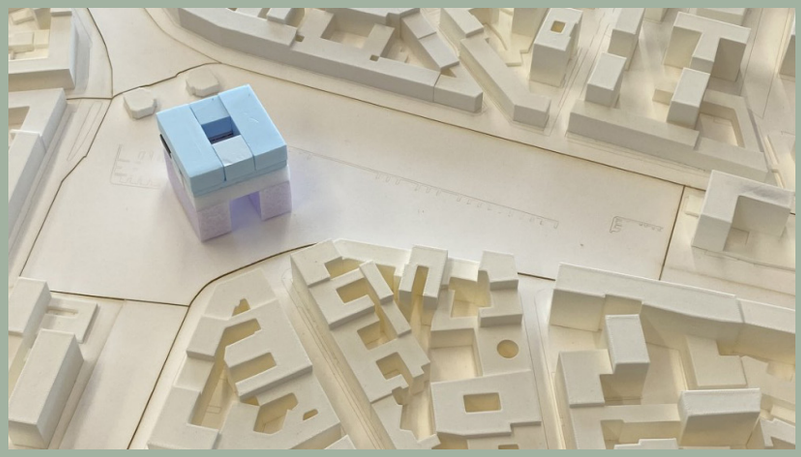
- Having a green atrium as a key space for central meeting.
- Share-able functions around it.
- Appointed learning/ knowledge rooms have indoor greenery.
- Public and private connections.

Program massing models

Program | A | Spreading the functions (wide)



Program | B | Clustering the functions (cube)



Program | C | Stacking the functions (tower)

Site

In this sub chapter the site where the building will be built is being analysed.

Background
The plot it located north of the old city centre of Milan (figure 32). The plot has an L-shape and is divided into two halves by a road. An impression of the plot and it's direct surrounding is shown in a picture of the site model (figure 33).

Figure 32: Location of the plot on the map of Milan.

Figure 33: Model of the site and surroundings (L-shaped divided by the road)

Connection zone
Back in the days on the plot the old Spanish walls used to be. This location was a border between the inner city and outer landscape. The plot used to be a transitional zone. Nowadays the old walls and gates are gone, but the plot is still a transitional zone but then between the old city centre, the business district and china town. As a requirement of the site it is important to keep this in mind and create a transitional zone that connects the neighbourhoods.

Figure 34: L scale: the old city walls as a border/ transitional zone.

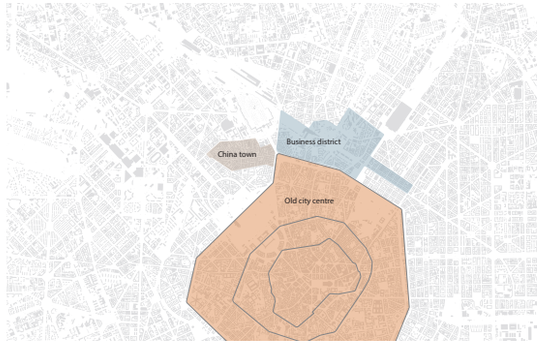


Figure 35: M scale: the current different neighbourhoods.

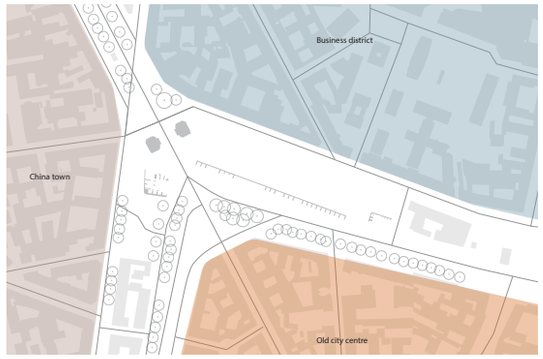


Figure 36: S scale: the current different neighbourhoods.

Figure 37: The wish to create a connection zone.

Site

Archaeology

The plot is located on a location where the old Spanish city walls used to be and some archaeological remains of these walls can be found on the site as well as the old toll houses. In the design these remains need to be preserved and cherished so that the history will be protected.

Figure 38: The wish to preserve and cherish the archaeological finds.

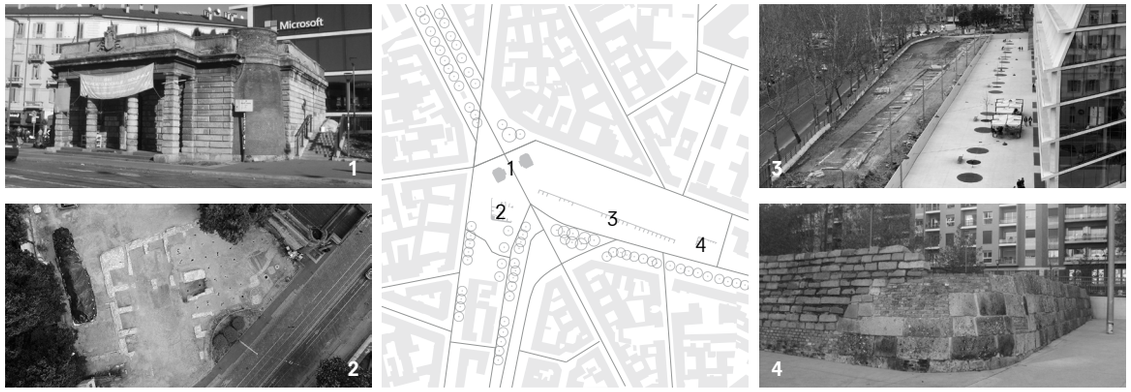


Figure 39: The found archaeological remains of the old city walls on the plot.

A green oasis

In Milan there is something called the green belt that is a network of greenery that strengthens one another. The municipality of Milan wants to strengthen this in the coming years by going green: planting 3 million trees before 2030 and increasing the tree canopy by 5%.

When looking at the map of Milan it can be seen that the appointed plot is located in this green web and makes up for an important spill to the north of Milan especially with the planned green zone: Farini a bit up north of the site. When visiting the site it was noticed that there was not that much greenery in itself, but more just trees. Therefore a requirement of the site would be to create a green environment with grass, trees and flowers to strengthen the green belt.

Figure 40 L scale: the site is a spill in the green belt.

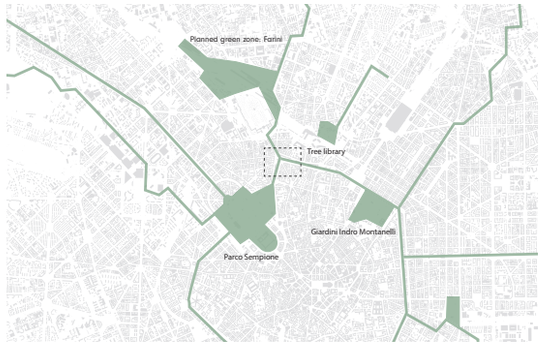


Figure 41: M scale: the location as a spill in the green web. Especially with the panned green zone Farini.

Figure 42: S scale: when looking at the site there is not much greenery apart form trees.

Figure 43: The wish to create a green zone.

Site

The culture of Milan

The culture of Milan can be seen in the way the city is built as well. A quick analysis of this and how I want to use/ change this in the project can be seen in figure 44. This affects the possible types of nature inclusive building ways and narrows them down to six (figure 45).

Where these nature-inclusive types are coming from and how it is changed has been part of the thesis research and can be seen in the sub-chapter thesis topic.

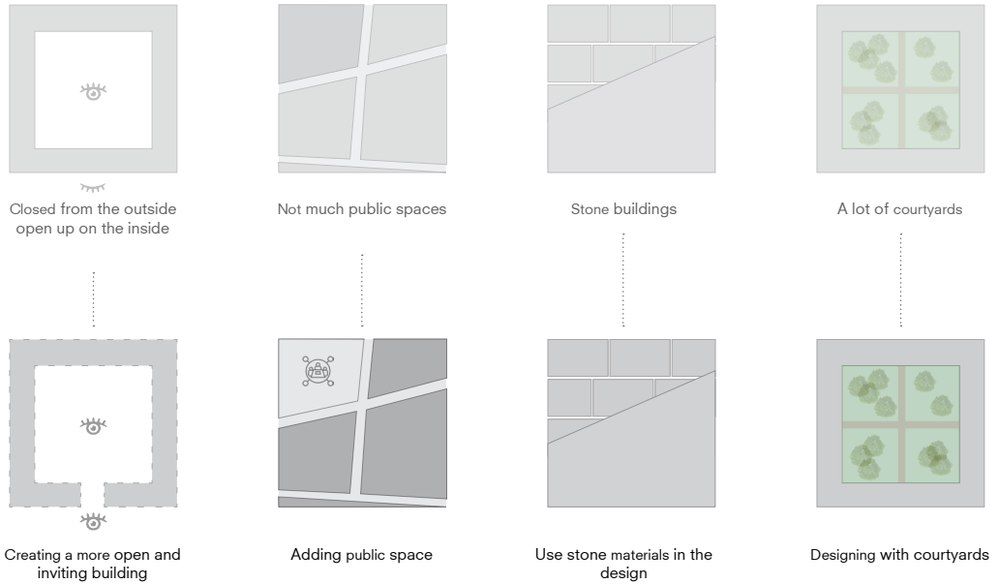


Figure 44: Milan building culture and takeaways from it.

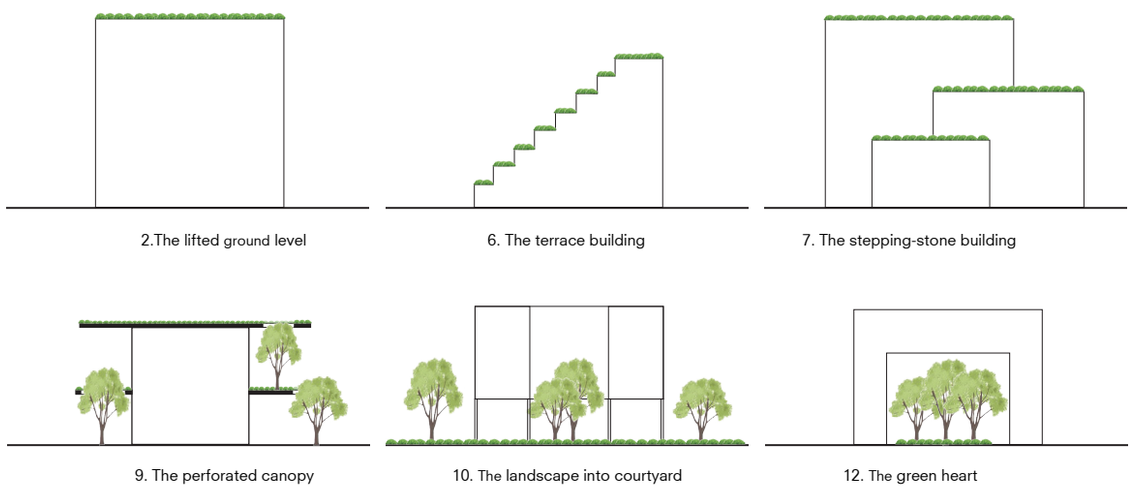


Figure 45: Possible types of nature-inclusive building styles.

Local green

In order for a symbiosis to be successful greenery known to the location should be used and this is also a requirement form UNESCO green citizens. For this information cards of local plants and trees are made. Examples of these can be seen in figure 46.
In the sup-chapter thesis topic a full version of these cards can be seen and also where the input came from.

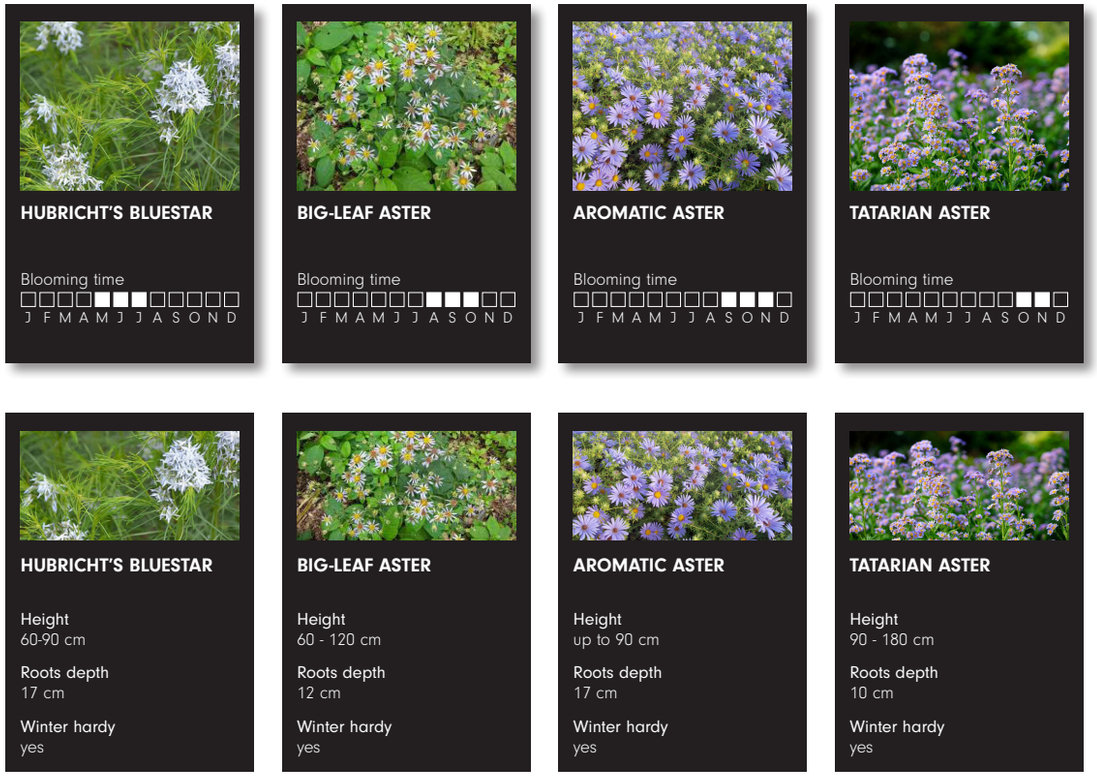


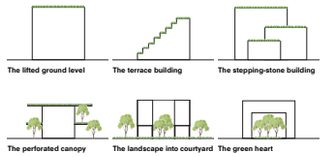
Figure 46: Previews of plant & tree info cards.

Site conclusions

Creating a green zone while respecting the archaeology & connection

- Creating a **connection** between the neighbourhoods.
- Cherishing and **showing** the **archaeological remains**.
- Creating a **green environment** with grasses, bushes and trees.

Fitting nature-inclusive systems



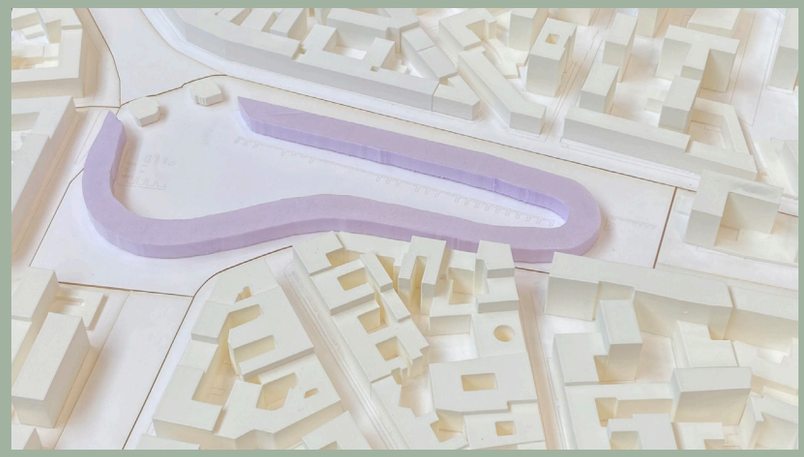
Using one or a combination of the typologies:

- Lifted ground level
- Terrace building
- The stepping stone building
- The perforated canopy, the landscape into courtyard
- The green heart

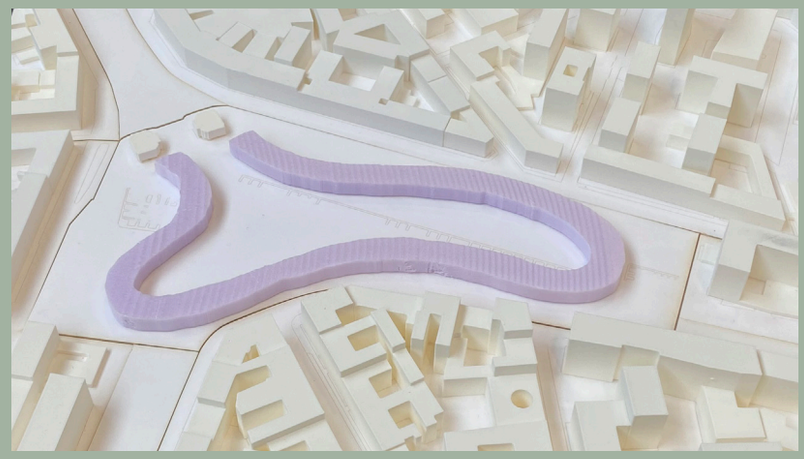
Using site known greenery

- Plants and trees known to Milan should be used.

Site massing models



Site | A | Revolving around the plot



Site | B | Organic revolving around the plot

Site | C | Organic pavilions around the plot

Thesis topic | A symbiosis between architecture and nature

Research question

Cities are growing and nature is lacking in and around buildings. This causes environmental problems, and the city of Milan wants to go green by using buildings to increase the amount of urban nature. In this study the following research question will be answered to gather information about how this goal can be achieved:

"How can a symbiosis between a building and greenery be designed for Fondazione Feltrinelli, Microsoft office, and the Ministry of Culture in Milan to enhance environmental sustainability and user experience in office and library spaces?"

Sub questions

To be able to give an answer to the research question, the following sub questions are researched:

- Which architectural and landscape design strategies can improve a symbiosis between a building and green in the design for Fondazione Feltrinelli, Microsoft office and the ministry of culture Milan?
- How can the design of a biophilic building contribute to the energy efficiency and environmental characteristics of the building?
- Which green systems are the most fitting within the context of a library, office and museum for Fondazione Feltrinelli, Microsoft office and the ministry of culture Milan?
- How does the symbiosis with greenery add to the well-being and user experience of users in offices and libraries?

Architectural and landscape design strategies for symbiosis

To create a symbiosis between architecture and nature it is necessary to gather insights into possibilities of implementing greenery into architecture. In this paragraph the following sub-question will be answered to show what is possible.

"Which architectural and landscape design strategies can improve a symbiosis between a building and green in the design for Fondazione Feltrinelli, Microsoft office and the ministry of culture Milan?"

<u>Types of nature-inclusive buildings</u>

According to (Vink, Vollaard, & de Zwarte, 2023, p. 66) there are 8 types of nature-inclusive buildings. There are:

1. The tower: In the tower there are possibilities for green façades or balconies to provide greenery. On the roof this is possible as well, but the surface area is bounded, so the rest of the façade and balconies is where most of the greenery is positioned. An example of such a building is Bosco Verticale in Milan.
2. The lifted ground level: The lifted ground level is a building where the amount of space consumed by the building is compensated on the roof level by a green area. These are perfect for dense inner-city area, since this is possible on most buildings. An example of this type is the Chicago city hall.
3. The lifted landscape: With this type, the landscape is placed halfway on the building. Because of this the in between landscape is a bridge between the towers and ground levels and serves as a connection. The standard hotel on the High Line New York is an example of this type.
4. The vertical landscape: The vertical landscape is a building with a green façade as a continuation of the landscape on ground level. An example of this type is The Larkin Street Substation Expansion, San Francisco.

5. The landscape across the building: The landscape building flows from a landscape into a building by greenery growing on the sloped roof. Since this takes up quite some space this type is mostly used in outer city areas and not dense inner cities. An example of such a building is the central library of TU Delft.
6. The terrace building: This type of green building has terraces on multiple levels that are relatively close to one another in height, so this makes it that interaction between the terraces is possible between people, plants and other species. An example of this greenery type is the Kengo Kuma office of the future.
7. The stepping-stone building: The stepping-stone building type consists of different volumes that step up. These different volumes all have a green roof that is interact-able with the levels below and above creating a stepping green volume. The Forest House, Thailand, by Shma Company is an example of this building type.
8. The rock building: In this type there is no rigid or fast form, but the building is constructed by different sizes and maximizes roof/ terrace areas that create places for greenery on different levels. An example of this type is the Valley in Amsterdam.

Figure 47: Bosco verticale.

Figure 48: Chicago city hall.

Figure 49: The standard hotel on the High Line New York.

Figure 50: The Larkin Street Substation Expansion, San Francisco.

Figure 51: The central library of TU Delft.

Figure 52: Kengo Kuma office of the future, Milan.

Figure 53: The Forest House, Thailand.

Figure 54: The Valley, Amsterdam.

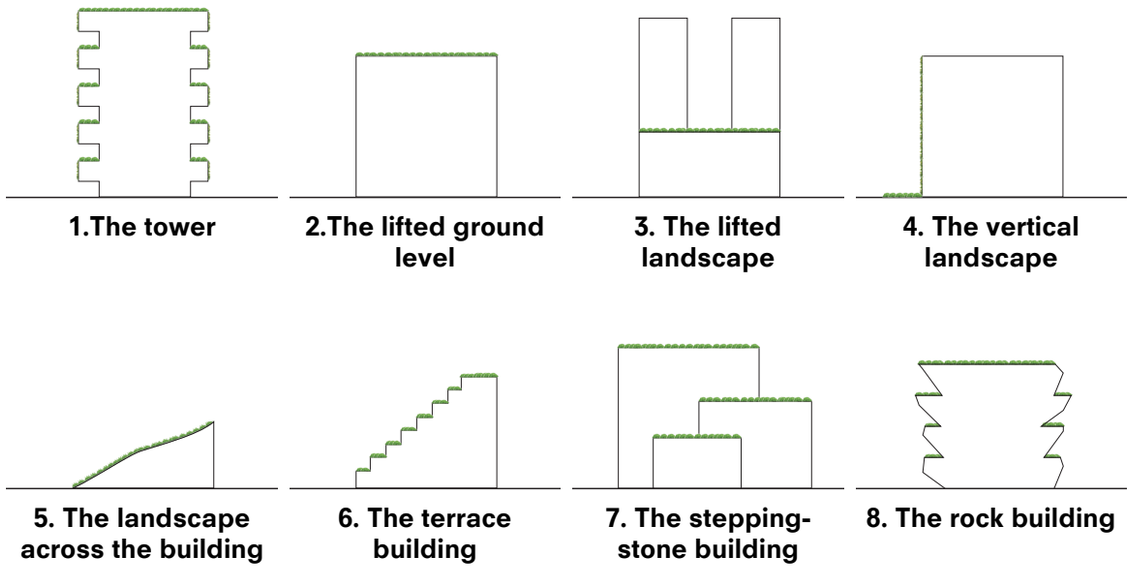


Figure 55: Types of nature-inclusive buildings according to the book building urban nature.

Thesis topic | A symbiosis between architecture and nature

Additional types of greenery based on case studies.

The types described before are the most common ones, but when looking other case studies there are more nature-inclusive types of greenery. In this research four other buildings will be analysed for their nature-inclusiveness and will be translated into four more types. The researched buildings are The house of music in Budapest, the Joint Research Centre by Mecanoo in Seville, the proposed Ternes-Villiers, La Ville Multi-Strate in Paris and The shared education building in Saclay, France.

9. The House of Music, Budapest: In this design canopies are used as an extension of the roof. These canopies have holes in them to give space for trees. Type: **The perforated canopy.**
10. The Joint Research Centre by Mecanoo, Seville: Within this project there is a landscape that flows through underneath the building contours and opens up on the inside again creating a courtyard. Type: **The landscape into courtyard.**
11. The proposed Ternes-Villiers, La Ville Multi-Strate Paris: This design proposal showcases multiple building volumes that have green balconies and rooftops, which are connected with another by slopes/ bridges to create a green environment along these volumes. Type: **The green slope.**
12. This building is an example of a building type that has a big atrium or courtyard filled with greenery within the heart of the building. Type: **The green heart.**

Figure 56: The house of music, Budapest.

Figure 57: The Joint Research Centre by Mecanoo, Seville.

Figure 58: The proposed Ternes-Villiers, La Ville Multi-Strate Paris.

Figure 59: Shared Education Building Saclay, France.

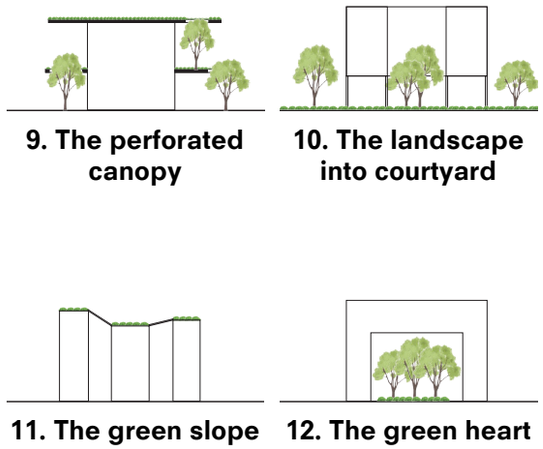


Figure 60: Additional types of nature-inclusive buildings.

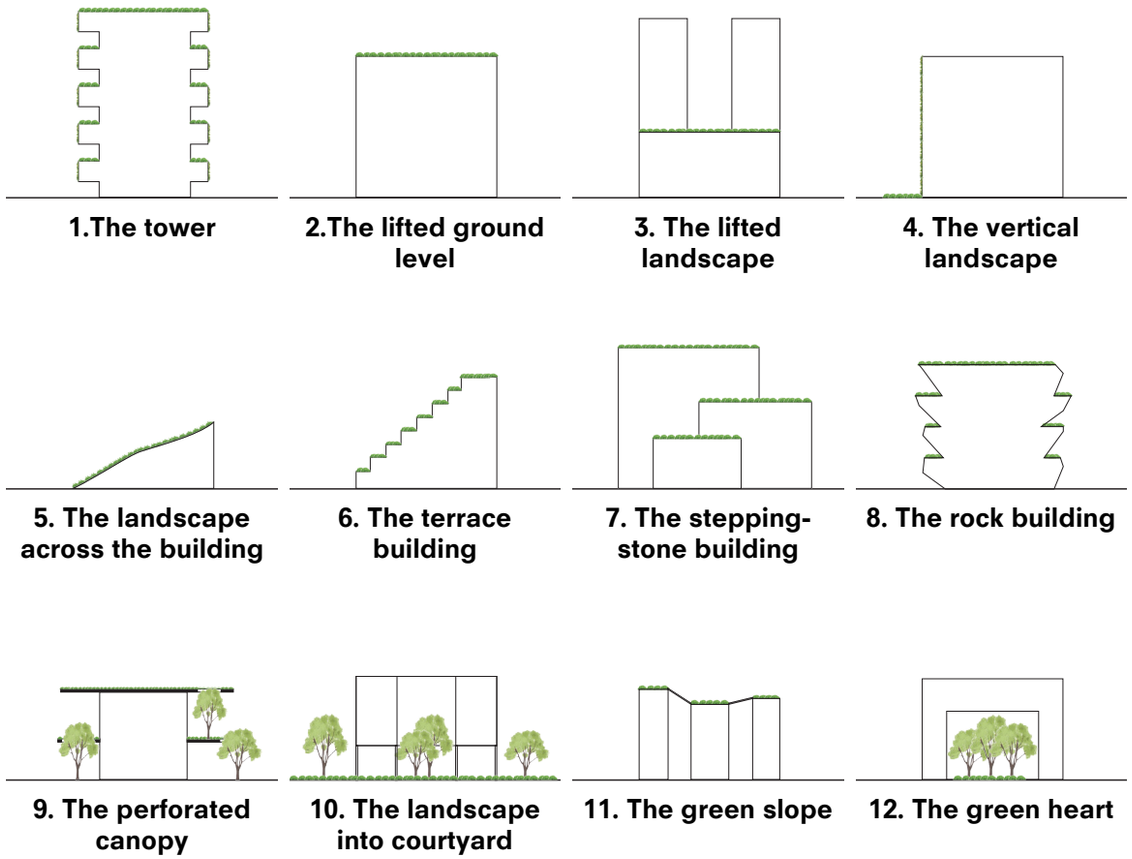


Figure 61: Overview of all types of nature-inclusive buildings.

Transitional zones.
Kellert (2018) states the following: "Biophilic design occurs in a multiplicity of settings, including interior, exterior, and transitional spaces and landscapes." Thus not only interior and exterior spaces are needed to create a successful symbiosis, but also the spaces that create a transition between the both. These transition zones help to bridge the gap between the inside and outside and therefore help create a symbiosis. According to the book Building urban nature by (Vink, Vollaard, & de Zwarte, 2023, p. 182) there are four types of transitional spaces:

1. **The green atrium:** The atrium is a central open space within a building with a glass roof. This space allows for lush greenery to grow inside of the building.
2. **A pergola besides the side of the building:** The pergola is a construction on the side of the building that creates space for plants to climb up and provides the building and created outside space with shading.
3. **An overarching green pergola around the building:** The pergola can be scaled up into a construction around the whole building.
4. **A conservatory around or in front of the building:** A conservatory is a glass enclosed space around the building that lets in light and creates an environment for greenery and light.

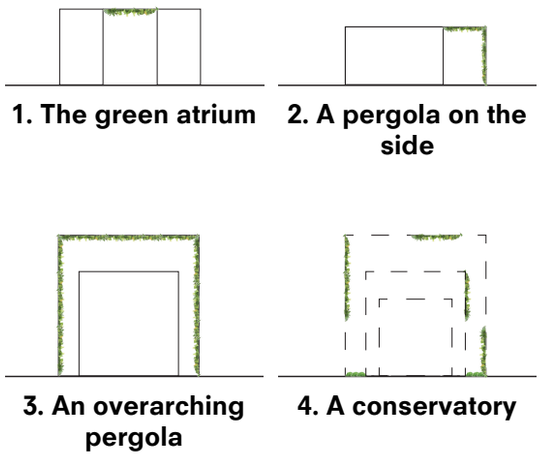


Figure 62: Types of transitional green zones.

Biophilic design and energy efficiency
Implementing greenery in and onto the design of a building has multiple benefits like enhancing user experience, which will be discussed later, but also on the energy efficiency of a building. In this paragraph the following sub-question will be answered to give insights into what design requirements are needed to achieve a positive energy efficiency and environmental characteristics:

"How can the design of a biophilic building contribute to the energy efficiency and environmental characteristics of the building?"

Ding, Cui, Chen, & Zhang (2024) states that biophilic design can have a positive influence on the air quality, energy efficiency, sound-scape of a building and heat surrounding the building.

Air quality
As mentioned in the research plan Milan is like many others a very polluted city. Adding greenery to the cityscape, but also to the indoors of a building can help improve the air quality on city- and building scale.

By absorbing CO2, the air quality in and around green buildings can be improved. It can improve indoor air quality by natural ventilation (Ding, Cui, Chen, & Zhang, 2024). At the same time leaves of trees and plants can trap air pollutants, cleaning the air around it (Leung, Tsui, Yip, Vrijmoed, & Liu, 2011). There must be caution when making choices for greenery, since the wrong types of greenery in an environment can produce biogenic volatile organic compounds (BVOCs), which will reduce the air quality (Leung, Tsui, Yip, Vrijmoed, & Liu, 2011).

Plants can improve the air quality by absorbing CO2 and picking up pollution. When adding plants to an environment one should be cautious to pick plants and trees fitting within the location.

Water storage
Green roofs and façades can help work as a buffer for water within cities and help with water storage to prevent floods (Ding, Cui, Chen, & Zhang, 2024). This by managing storm-water runoff through the soil. This water can be soaked up by the plants or evaporated or drained into the ground. For the last a water drainage from the roofs/walls onto ground level is essential (Stuiver, Spijker, de Vries, & Snep, 2018).

Managing Heating and cooling
Biophilic architecture can reduce cooling energy consumption up to 70% (Mihalakakou, et al., 2023). Research done by Karachaliou, Santamouris, & Pangalou (2015) Shows that the presence of a green roof can reduce heating and cooling up to 11-19%. This is because of the insulating qualities of the greenery. At the same time natural ventilation, the indoor climate can be improved through greenery which can help create better indoor temperatures (Ding, Cui, Chen, & Zhang, 2024).

Plants can cool the air by evaporating water, this process uses heat from the air and with that reduces the heat in cityscapes (Stuiver, Spijker, de Vries, & Snep, 2018).
The use of greenery in and around buildings can help reduce heat locally by projecting shadows onto the façades behind it. This way the façade materials do not heat up and reflect heat as much as before (Urban Technology, 2022).

All and all the presence of greenery in and around can help control heat and cooling within and around a building by preventing overheating through evaporation of plants, insulating and shadows. The shadow works of the trees and bushes has the biggest impact on the reduction of heat (Urban Technology, 2022). To achieve this result there is some space needed between a building and the greenery to be able to give these shadows.

Sound-scape
The presence of greenery and water in the built environment has been proved to reduce noise pollution and therefore improves a sound-scape. This can be done by using nature as a sound barrier between zones (Guo, 2016). A study by Guo (2016) shows that creating a barrier of greenery between functions and zones and creating sights on greenery makes up for physiological noise reduction.

Improved biodiversity
With cities growing and urbanizing more there is a loss of biodiversity: "urban land conversions are expected to be an increasingly prominent driver of habitat and biodiversity loss" (Simkin, Seto, McDonald, & Jetz, 2022). Simkin, Seto, McDonald, & Jetz (2022) state that it can even lead up to 10% or more habitat loss of species within urban environments. When incorporating nature into buildings the biodiversity of plants, animals and insects can be promoted (Ding, Cui, Chen, & Zhang, 2024). For the biodiversity it is also of essence to work with plant species that are known to the area (Kellert & Calabrese, 2015).

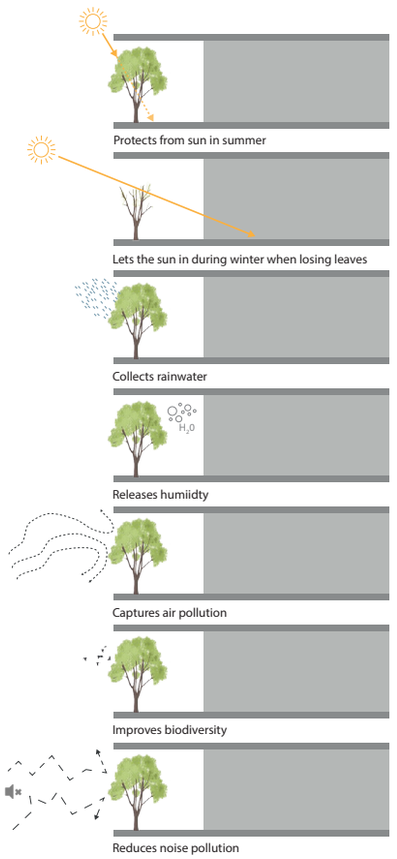


Figure 63: Benefits of green architecture.

Greenery and user experience & well-being

In this paragraph the user experience will be researched and especially how a symbiosis can have a positive effect on this. To gather these insights the following question is asked:

"How does the symbiosis with greenery add to the well-being and user experience of users in offices and libraries?"

It is proven that having nature around can have a positive influence on the user experience (Terrapin Bright Green LLC, 2014) states that there are 14 patterns that have positive effects on stress reduction, cognitive performance and emotion, mood & preference. In figure 64 these patterns can be seen.

	14 PATTERNS	*	STRESS REDUCTION	COGNITIVE PERFORMANCE	EMOTION, MOOD & PREFERENCE
NATURE IN THE SPACE	Visual Connection with Nature	* * *	**Lowered blood pressure and heart rate** (Brown, Barton & Gladwell, 2013; van den Berg, Hartig, & Staats, 2007; Tsunetsugu & Miyazaki, 2005)	**Improved mental engagement/ attentiveness** (Biederman & Vessel, 2006)	**Positively impacted attitude and overall happiness** (Barton & Pretty, 2010)
	Non-Visual Connection with Nature	* *	**Reduced systolic blood pressure and stress hormones** (Park, Tsunetsugu, Kasetani et al., 2009; Hartig, Evans, Jamner et al., 2003; Orsega-Smith, Mowen, Payne et al., 2004; Ulrich, Simons, Losito et al., 1991)	**Positively impacted on cognitive performance** (Mehta, Zhu & Cheema, 2012; Ljungberg, Neely, & Lundström, 2004)	**Perceived improvements in mental health and tranquility** (Li, Kobayashi, Inagaki et al., 2012; Jahncke, et al.,| 2011; Tsunetsugu, Park, & Miyazaki, 2010; Kim, Ren, & Fielding, 2007; Stigsdotter & Grahn, 2003)
	Non-Rhythmic Sensory Stimuli	* *	**Positively impacted on heart rate, systolic blood pressure and sympathetic nervous system activity** (Li, 2009; Park et al, 2008; Kahn et al., 2008; Beauchamp, et al., 2003; Ulrich et al., 1991)	**Observed and quantified behavioral measures of attention and exploration** (Windhager et al., 2011)	
	Thermal & Airflow Variability	* *	**Positively impacted comfort, well-being and productivity** (Heerwagen, 2006; Tham & Willem, 2005; Wigö, 2005)	**Positively impacted concentration** (Hartig et al., 2003; Hartig et al., 1991; R. Kaplan & Kaplan, 1989)	**Improved perception of temporal and spatial pleasure (allies thesia)** (Parkinson, de Dear & Candido, 2012; Zhang, Arens, Huizenga & Han, 2010; Arens, Zhang & Huizenga, 2006; Zhang, 2003; de Dear & Brager, 2002; Heschong, 1979)
	Presence of Water	* *	**Reduced stress, increased feelings of tranquility, lower heart rate and blood pressure** (Alvarsson, Wiens, & Nilsson, 2010; Pheasant, Fisher, Watts et al., 2010; Biederman & Vessel, 2006)	**Improved concentration and memory restoration** (Alvarsson et al., 2010; Biederman & Vessel, 2006) **Enhanced perception and psychological responsiveness** (Alvarsson et al., 2010; Hunter et al., 2010)	**Observed preferences and positive emotional responses** (Windhager, 2011; Barton & Pretty, 2010; White, Smith, Humphryes et al., 2010; Karmanov & Hamel, 2008; Biederman & Vessel, 2006; Heerwagen & Orians, 1993; Ruso & Atzwanger, 2003; Ulrich, 1983)
	Dynamic & Diffuse Light	* *	**Positively impacted circadian system functioning** (Figueiro, Brons, Plitnick et al., 2011; Beckett & Roden, 2009) **Increased visual comfort** (Elyezadi, 2012; Kim & Kim, 2007)		
	Connection with Natural Systems				**Enhanced positive health responses; Shifted perception of environment** (Kellert et al., 2008)
NATURAL ANALOGUES	Biomorphic Forms & Patterns	*			**Observed view preference** (Vessel, 2012; Joye, 2007)
	Material Connection with Nature			**Decreased diastolic blood pressure** (Tsunetsugu, Miyazaki & Sato, 2007) **Improved creative performance** (Lichtenfeld et al., 2012)	**Improved comfort** (Tsunetsugu, Miyazaki & Sato 2007)
	Complexity & Order	* *	**Positively impacted perceptual and physiological stress responses** (Salingaros, 2012; Joye, 2007; Taylor, 2006; S. Kaplan, 1988)		**Observed view preference** (Salingaros, 2012; Hägerhäll, Laike, Taylor et al., 2008; Hägerhäll, Purcella, & Taylor, 2004; Taylor, 2006)
NATURE OF THE SPACE	Prospect	* * *	**Reduced stress** (Grahn & Stigsdotter, 2010)	**Reduced boredom, irritation, fatigue** (Clearwater & Coss, 1991)	**Improved comfort and perceived safety** (Herzog & Bryce, 2007; Wang & Taylor, 2006; Petherick, 2000)
	Refuge	* * *		**Improved concentration, attention and perception of safety** (Grahn & Stigsdotter, 2010; Wang & Taylor, 2006; Wang & Taylor, 2006; Petherick, 2000; Ulrich et al., 1993)	
	Mystery	* *			**Induced strong pleasure response** (Biederman, 2011; Salimpoor, Benovoy, Larcher et al., 2011; Ikemi, 2005; Blood & Zatorre, 2001)
	Risk/Peril	*			**Resulted in strong dopamine or pleasure responses** (Kohno et al., 2013; Wang & Tsien, 2011; Zald et al., 2008)

Figure 64: 14 Patterns of biophilic design.

When analysing this figure there are some overlapping positive effects of creating a symbiosis with nature that influence the user experience:

- Lowered blood pressure and heart rate: The presence of nature around is shown to be relaxing, lowers blood pressure and stress (Park, et al., 2009).
- Improved mental engagement: A study done by (Windhager, Atzwanger, Bookstein, & Schaefer, 2010) showed that people who were looking at natural elements like an aquarium were showed more attention to their environment. They stated that when biophilic elements are present people show more social interaction and attention.
- Positively impacted happiness & mental health: It is proven by a study done by Barton & Pretty (2009) that having nature in one's environment results in improved mood and self-esteem. Mental health foundation (n.d.) also states: "Research shows that people who are more connected with nature are usually happier in life and more likely to report feeling their lives are worthwhile".
- Reduced stress: Park, et al. (2009) States that cortisol levels due to stress can be reduced by biophilic design.
- Positive impact on cognitive performance & concentration: it is proven that a lack of nature, called nature deficit disorder, can lead to worsened cognitive performances (rachelcarsoncouncil, n.d.). "Strong or routine connections with nature can provide opportunities for mental restoration, during which time our higher cognitive functions can sometimes take a break. As a result, our capacity for performing focused tasks is greater than someone with fatigued cognitive resources" (Terrapin Bright Green LLC, 2014).
- Positive impacted comfort and well-being: A study done by Samus, Freeman, van Heezik, Krumme, & Dickinson (2021) showed that having nature around in urban settings like a landscape park or urban park influences one's well-being in a positive way.
- Improved perception of spatial pleasure: Spaces can be perceived wider and therefore create more spatial pleasure as has been proven by a study of Repke, et al. (2018).

All in all, having nature around has a positive effect on stress reduction, cognitive performance and emotion, mood & experience.

<u>Patterns of biophilic design</u>

As can be seen in figure 64 these positive effects can be achieved by using the 14 patterns:

1. Views on nature: Having greenery around to look upon.
2. Sounds of nature: Having greenery around to create these sounds.
3. Non-Rhythmic Sensory Stimuli (sounds of nature that have no rhythm): creating a place for birds and other animals to make such sounds in nature.
4. Creating natural airflow: Having natural ventilation around.
5. Presence of water: Having water around.
6. Natural light: Having big openings in the façades.
7. Connection with natural system: Creating views on nature that changes during seasons.
8. Natural forms & patterns: Using organic forms and patterns.
9. Using natural material.
10. Using orders from nature: Using orders like can be seen in nature.
11. Creating prospect: creating views for overview.
12. Refuge: Having places to retreat.
13. Mystery: Creating curiosity by transparent materials or hidden nooks.
14. Risk/peril: Creating an identifiable thread coupled with reliable security (like cantilevers, water where one could fall in).

Requirements for the positive effects of a symbiosis

These patterns can be translated into the following design requirements:

- Having nature like green around (for views, sounds and non-rhythmic stimuli)
- Using water elements
- Using big open-able façade openings (for views, natural light, airflow, connection to natural systems and creating prospect)
- Using natural materials
- Using natural shapes/patterns
- Creating a place to retreat (like a green oasis)
- Creating mysterious nooks/ walls
- Creating a thread with security

Nature for view, sounds and non-rhythmic stimuli

Using water features

Using big open-able façade openings (views, light, airflow and connection)

Using natural materials

Using natural shapes/ patterns

Creating a place to retreat

Creating mysterious nooks/ walls

Creating a thread with security

Green systems fitting within the context

To make the design of the library, office and museum in Milan successful it is necessary to make it suitable within the context of the site, program, client, climate and the culture of Milan. Therefore, in this chapter an answer will be given to the following sub-question:

"Which green systems are the most fitting within the context of a library, office and museum for Fondazione Feltrinelli, Microsoft office and the ministry of culture in Milan?"

Firstly, it is of the essence to know which green systems exist. Green façades, green roofs and green balconies are researched. Next up the types of green architectures from the first paragraph will be compared to the context specifics of the given site in Milan to see which types are suitable and which not in this specific scenario. Lastly the greenery that will be used in the design needs to be able to grow within Milan and so the plant and tree species of Milan are researched.

Suitable types of greenery in this context

The design of the building should be fitting within the context of Milan and so it is of essence to understand the character of the city of Milan. During a site visit to the city some characteristics of the city and site stood out:

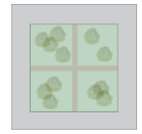
- Open vs. closed Milan

Milan is a city with a lot of closed of façades, a bit like a private city, but once you walk through the façades the buildings open up from the inside with courtyards. This characteristic I would want to continue a bit to maintain the character of the city, but at the same time make the insides more visible and inviting.

Figure 65: Current closed vs. open character and wish for a bit more open character.

- Courtyard architecture

As mentioned before the city holds a lot of courtyards with greenery inside of them. To connect to this the green courtyards would have to be continued within the design of this building.



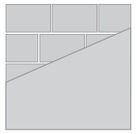


Figure 66: Courtyard architecture in Milan.

Figure 67: Stone material façades in Milan.

- Using stone like façades

The city holds a lot of buildings with natural stone façades. I want to continue this in the design of the building to be able to connect to the surroundings and really make the building a part of Milan.

- Lack of public space

Within Milan there are some big piazzas and parks as highlights, but apart from those there is not a lot of public space for the residents of Milan and within this design I would want to add to the public space.

Figure 68: Lack of public space vs. adding meeting spaces.

- Narrow site

The site is a narrow one within an urban landscape that makes it harder to create a big volume for greenery and landscapes that flow from ground to roof level.

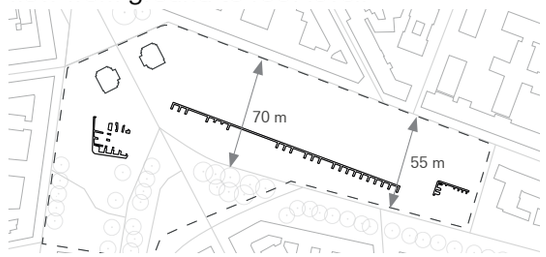


Figure 69: Narrow site with old ruins.

- Old ruins

The old ruins of the site are an important reflection of the history of Milan and would have to be preserved. This takes up some space of the site and makes it even more narrow.

- Transitional zone

With the wish of the site being a transitional zone for the different neighbourhoods it is essential to create some kind of connection between the northern and southern neighbourhoods and not build a building too massive that disconnects one another.

- Green balconies

In Milan a lot of balconies are used for plants and greenery and therefore the green balcony architecture fits within the context.

- Green roofs

Within the city there are a lot of green roofs to be seen, and this shows that the people here are seeking more greenery and so the green roof type can connect the building and the neighbourhood well.

The characteristics of the site and city make it so that the 12 types of nature-inclusive design can be narrowed down since some of them are not suitable for this site or city characteristics.

In figure 70 can be seen which of the previously discussed nature-inclusive building types are fitting within this context.

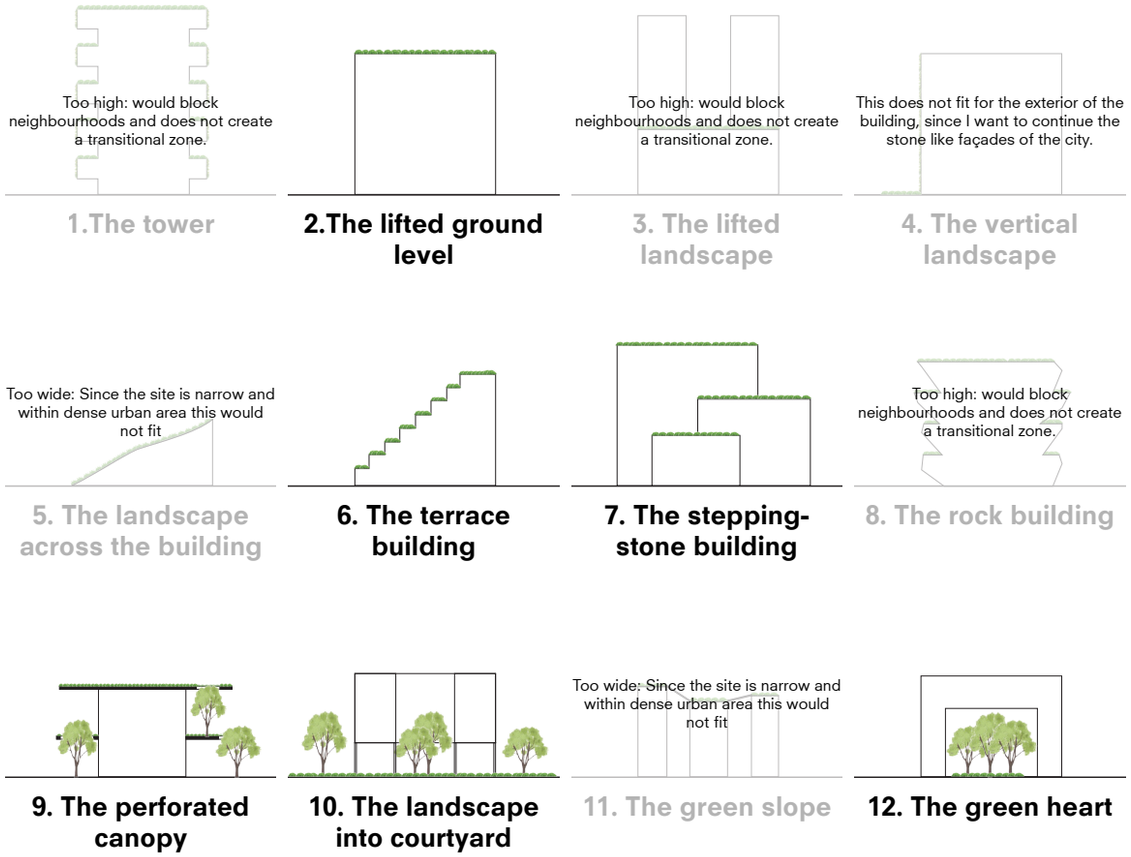
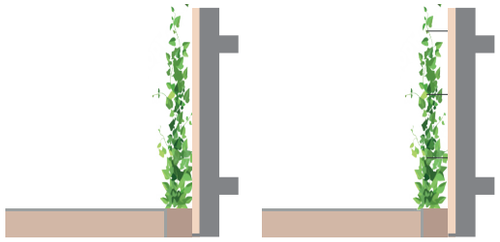


Figure 70: Overview of types of nature-inclusive buildings fitting within the context.

Green façades

As mentioned before most of the outer façades that are to be seen in elevations will be made of stone like materials to connect to the surroundings, but some inner façades in courtyards for example can be green façades. In order to use such façades in the design it is important to know which types of green façades there are. There are 6 types of green façades (Pearlmutter, Calheiros, Hoffmann, & Pucher, 2021):

- Type A1: Ground bounded self-attached, this is a climbing plant like ivy that attaches itself to the wall system with its roots. It grows from the soil on the ground level.
- Type A2: Ground bounded guided, this is also a climbing plant, but this one can does not attach itself and needs a system like a raster or cables to support itself. It grows from the soil on the ground level.
- Type B1: Wall bounded stand-alone system, this system has a substrate and irrigation layer and can provide itself. The plants are rooted into the system on one side.
- Type B2: Wall bounded panels, in this system there are panels with substrate that hold different plants and can be attached to façades. This makes green façades to be flexibly designed.
- Type C1: Pot-based ground, this system consists of plant boxes placed on the ground. This system needs a platform to be placed on.
- Type C2: Pot based wall attached, within this system plant boxes are attached to the wall that grow plants.



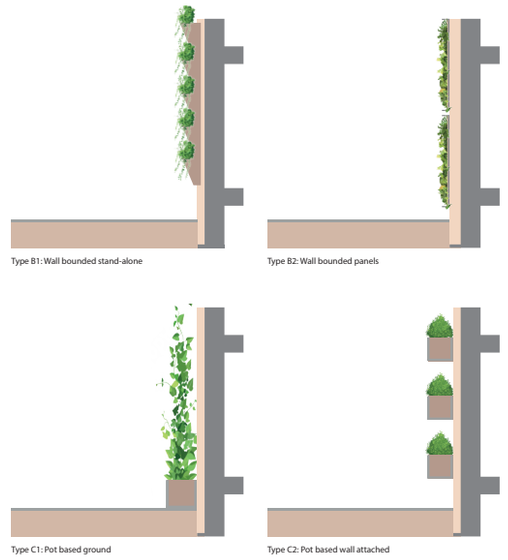


Figure 71: Types of green façades.

Green roofs

According to (Vink, Vollaard, & de Zwarte, 2023, p. 171) there are two types of green roofs; the extensive and intensive one. Both are built from the same materials: construction -> vapour barrier -> insulation -> waterproofing -> protective layer -> water retention layer -> filtering layer -> substrate -> vegetation layer, but in different thickness's from the water retention layer till the vegetation layer. The extensive green roof is minimal and is suitable for lower planting like grass & moss. The intensive green roof is thicker and fits even trees & shrubs.

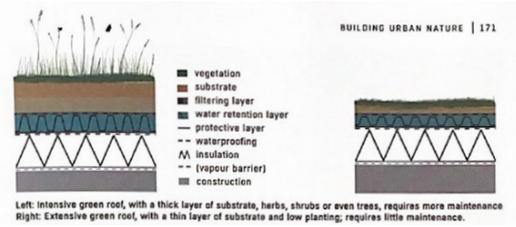


Figure 72: Built up of green roofs.

Ding, Cui, Chen, & Zhang (2024) add one more green roof type: the semi-intensive green roof which allows for grasses and shrubs but not trees.

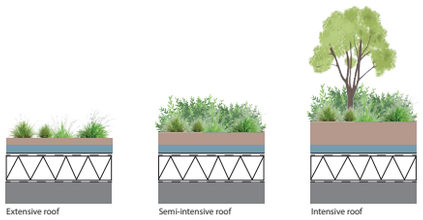


Figure 73: Classifications of green roofs.

A problem with green roofs can be the root depth of trees that can be a lot deeper than the substrate layer. A solution to this is working with plant-boxes that allow deeper roots like is done in the Forest House in Thailand by Shma Company Limited.

Figure 74: The forest house by Shma Company Limited.

Figure 75: Addition to classifications of green roofs: plant-box roof.

When wanting to create a symbiosis between architecture and greenery and make it visible from street level onward it is crucial to be able to see the green roof and with heights only trees and high shrubs can obtain this and so semi-intensive, intensive or plant-box roofs are essential.

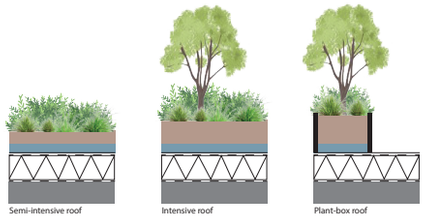


Figure 76: Suitable classifications of green roofs for a symbiosis.

Green balconies

Green balconies or canopies kind of have the same assembly as green roofs, but without the vapour barrier and insulation layer. There is one more option; the hanging garden, which uses balustrades to hang up green panels. For the balconies and canopies the plant box- and the intensive balconies need a lot of support if not supported by columns and so for unsupported balconies and canopies the extensive, semi-intensive and panelled balustrade type would be best. However, the wish is to create balconies that can be used as an outdoor space and create shadow onto the façade, so a support system would be helpful to create intensive and plant-box balconies, possibly with a panelled balustrade.

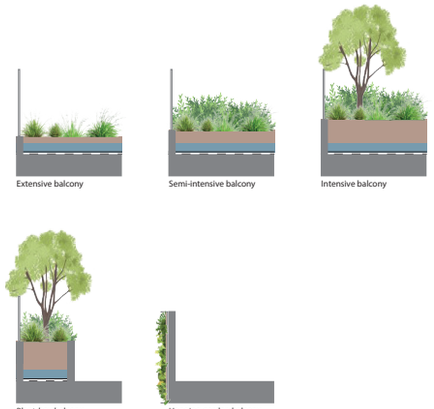


Figure 77: Types of green balconies.

Types of plants and trees

For the greenery to work and flourish in this specific location it is important to use plants and trees that are inhabitants of Milan and to document the specific blooming times of these plants and to see if they are winter hardy and survive this climate. Another important aspect is to see the height and root depth of these specific plants.

For the trees Picture this (n.d.) is used to indicate which trees are common in Milan and to give information about the specific of these trees.

For the plants the tree library in Milan is a source of information. The info cards about the plants (figure 78 & 79) make up for a big source of information and to gain insight into the specifics of the types of plants Gardenia, (n.d.) is used.

Figure 78: First information card about plants in Milan.

Figure 79: Second information card about plants in Milan.

FRONT BACK FRONT BACK FRONT BACK FRONT BACK

HUBRICHT'S BLUESTAR
Blooming time: J F M A M J J A S O N D
Height: 60-90 cm
Roots depth: 17 cm
Winter hardy: yes

BIG-LEAF ASTER
Blooming time: J F M A M J J A S O N D
Height: 60 - 120 cm
Roots depth: 12 cm
Winter hardy: yes

AROMATIC ASTER
Blooming time: J F M A M J J A S O N D
Height: up to 90 cm
Roots depth: 17 cm
Winter hardy: yes

TATARIAN ASTER
Blooming time: J F M A M J J A S O N D
Height: 90 - 180 cm
Roots depth: 10 cm
Winter hardy: yes

PURPLE MOOR-GRASS 'DAUERSTRAHL'
Blooming time: J F M A M J J A S O N D
Height: 50 - 120 cm
Roots depth: 50 cm
Winter hardy: yes

PURPLE MOOR-GRASS 'STRAHLENQUELLE'
Blooming time: J F M A M J J A S O N D
Height: up to 90 cm
Roots depth: 50 cm
Winter hardy: yes

SWITCH GRASS 'CLOUD NINE'
Blooming time: J F M A M J J A S O N D
Height: 150 - 210 cm
Roots depth: up to 180 cm
Winter hardy: yes

SWITCH GRASS 'SHENANDOAH'
Blooming time: J F M A M J J A S O N D
Height: 90 - 180 cm
Roots depth: up to 300 cm
Winter hardy: yes

INDIANGRASS
Blooming time: J F M A M J J A S O N D
Height: 90 - 240 cm
Roots depth: 200 cm
Winter hardy: yes

GOLDEN OATS GRASS
Blooming time: J F M A M J J A S O N D
Height: 150 - 180 cm
Roots depth: 30 - 60 cm
Winter hardy: yes

BUGLEWEED
Blooming time: J F M A M J J A S O N D
Height: 10 - 20 cm
Roots depth: 10 - 30 cm
Winter hardy: yes

PENNSYLVANIA SEDGE
Blooming time: J F M A M J J A S O N D
Height: 30 - 60 cm
Roots depth: 20 - 30 cm
Winter hardy: yes

UMBRELLA BAMBOO
Blooming time - rare: J F M A M J J A S O N D
Height: 300 - 460 cm
Roots depth: 30 - 60 cm
Winter hardy: yes

JAPANESE AZALEA
Blooming time: J F M A M J J A S O N D
Height: 120 - 150 cm
Roots depth: 20 - 30 cm
Winter hardy: yes

ENGLISH IVY
Blooming time: J F M A M J J A S O N D
Height: 610 - 910 cm (climbing plant)
Roots depth: 20 - 30 cm
Winter hardy: yes

SOFT TOUCH JAPANESE HOLLY
Blooming time: J F M A M J J A S O N D
Height: up to 90 cm
Roots depth: 30 - 50 cm
Winter hardy: yes

BLUE GLOBE-THISTLE
Blooming time: J F M A M J J A S O N D
Height: 90 - 120 cm
Roots depth: 2 cm
Winter hardy: yes

HYBRID GERANIUM 'PATRICIA'
Blooming time: J F M A M J J A S O N D
Height: up to 120 cm
Roots depth: 40 cm
Winter hardy: yes

SIBERIAN IRIS
Blooming time: J F M A M J J A S O N D
Height: 60 - 120 cm
Roots depth: 5 cm
Winter hardy: yes

BLUE STAR KALIMERS / JAPANESE ASTER
Blooming time: J F M A M J J A S O N D
Height: 30 - 60 cm
Roots depth: 30 cm
Winter hardy: yes

ORIENTAL POPPY
Blooming time: J F M A M J J A S O N D
Height: 30 - 120 cm
Roots depth: 30 cm
Winter hardy: yes

RUSSIAN SAGE
Blooming time: J F M A M J J A S O N D
Height: 30 - 60 cm
Roots depth: 30 - 60 cm
Winter hardy: yes

ORPINE
Blooming time: J F M A M J J A S O N D
Height: 25 - 60 cm
Roots depth: 30 - 45 cm
Winter hardy: yes

BETONY
Blooming time: J F M A M J J A S O N D
Height: 30 - 60 cm
Roots depth: 30 cm
Winter hardy: yes

BLACK MONDO
Blooming time: J F M A M J J A S O N D
Height: 15 - 20 cm
Roots depth: 10 - 20 cm
Winter hardy: yes

ARROWWOOD 'DAWN'
Blooming time: J F M A M J J A S O N D
Height: 240 - 300 cm
Roots depth: 30 - 60 cm
Winter hardy: yes

WHITE-STEMMED BRAMBLE
Blooming time: J F M A M J J A S O N D
Height: 200 - 300 cm
Roots depth: 30 - 60 cm
Winter hardy: yes

COMMON BOX 'GRAHAM BLANDY'
Blooming time: J F M A M J J A S O N D
Height: 150 - 460 m
Roots depth: 20 - 40 cm
Winter hardy: yes

BUSH CLOVER THUNBERG
Blooming time: J F M A M J J A S O N D
Height: 120 150 cm
Roots depth: 30 - 60 cm
Winter hardy: yes

JAPANESE SEDGE
Blooming time: J F M A M J J A S O N D
Height: 30 - 60 cm
Roots depth: 20 - 30 cm
Winter hardy: yes

BOX HONEYSUCKLE
Blooming time: J F M A M J J A S O N D
Height: 90- 180 cm
Roots depth: 20 - 30 cm
Winter hardy: yes

RHODODENDRON 'PALESTRINA'
Blooming time: J F M A M J J A S O N D
Height: 75 - 100 cm
Roots depth: 20 - 30 cm
Winter hardy: yes

Figure 80: Information cards plants.

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EUROPEAN NETTLE TREE
Blooming time: J F M A M J J A S O N D
Height: 12 - 21 m
Roots depth: 2- 3 m
Evergreen: no

OLEANDER (TOXIC FOR KIDS AND PETS)
Blooming time: J F M A M J J A S O N D
Height: 2 - 6 m
Roots depth: 0,5 - 1 m
Evergreen: yes

EUROPEAN BEECH
Blooming time: J F M A M J J A S O N D
Height: 25 - 40 m
Roots depth: 2 - 3 m
Evergreen: no

BLACK LOCUST
Blooming time: J F M A M J J A S O N D
Height: 10 - 30 m
Roots depth: 2 - 3 m
Evergreen: no

OLIVE TREE
Blooming time: J F M A M J J A S O N D
Height: 4 - 15 m
Roots depth: 1 m
Evergreen: yes

LEMON TREE
Blooming time: J F M A M J J A S O N D
Height: 2 - 6 m
Roots depth: 0,6 -1,5 m
Evergreen: yes

CORN PLANT
Blooming time - rare: J F M A M J J A S O N D
Height: 4,5 - 15 m
Roots depth: 0,9 - 2 m
Evergreen: yes

SYCAMORE
Blooming time: J F M A M J J A S O N D
Height: 20 - 35 m
Roots depth: 2 - 4 m
Evergreen: no

POMEGRANATE TREE
Blooming time: J F M A M J J A S O N D
Height: 1,8 - 6 m
Roots depth: 1,5 - 2 m
Evergreen: no

COMMON HAZEL
Blooming time: J F M A M J J A S O N D
Height: 3 - 15 m
Roots depth: 1 - 1,5 m
Evergreen: no

BAY LAUREL
Blooming time: J F M A M J J A S O N D
Height: 7 - 18 m
Roots depth: up to 2 m
Evergreen: yes

COMMON HAWTHORN
Blooming time: J F M A M J J A S O N D
Height: 5 - 14 m
Roots depth: 1,5 - 2 m
Evergreen: no

CHERRY PLUM
Blooming time: J F M A M J J A S O N D
Height: 8 -12 m
Roots depth: 0,3 - 0,45 m
Evergreen: no

FIELD MAPLE
Blooming time: J F M A M J J A S O N D
Height: 8 - 11 m
Roots depth: 1 - 2 m
Evergreen: no

RUBBER TREE
Blooming time - Rare: J F M A M J J A S O N D
Height: 20 - 40 m
Roots depth: 1 - 2 m
Evergreen: yes

ROSE OF SHARON
Blooming time: J F M A M J J A S O N D
Height: 2 - 4 m
Roots depth: 0,5 -0,6 m
Evergreen: no

INDIAN LAUREL
Blooming time: J F M A M J J A S O N D
Height: 15 - 25 m
Roots depth: 1 - 2 m
Evergrеen: yes

COMMON FIG
Blooming time: J F M A M J J A S O N D
Height: 3 - 10 m
Roots depth: up to 3 m
Evergreen: no

NORWAY SPRUCE
Blooming time: J F M A M J J A S O N D
Height: 30 - 62 m
Roots depth: 1,5 - 2 m
Evergreen: yes

COMMON HOLLY
Blooming time: J F M A M J J A S O N D
Height: 9 m
Roots depth: up to 1 m
Evergreen: yes

Figure 81: Information cards trees.

Conclusion

The answer to the research question **"How can a symbiosis between a building and greenery be designed for Fondazione Feltrinelli, Microsoft office, and the Ministry of Culture in Milan to enhance environmental sustainability and user experience in office and library spaces?"** is not given by one aspect, but different elements of design are key to create a symbiosis on the specific given site:

Architectural and landscape strategies

There are 12 types of nature-inclusive buildings, but with the given site in a dense urban area with archaeological features and a transitional area only the lifted ground level, the terrace building, the stepping-stone building, the perforated canopy, the landscape into courtyard, the green heart or a combination of them would be suitable for the design for Fondazione Feltrinelli, Microsoft office, and the Ministry of Culture in Milan.

Energy efficiency and environmental impact

A symbiosis between building and greenery created biophilic design can enhance environmental sustainability by improving the air quality due to absorbing CO2, pollution and releasing 02, it can help with water storage and therefore reduce floods, it can insulate buildings and protect them from heat it the summer by shadowing and absorbing heat through evaporation, it can help reduce noise pollution when forming a barrier and add to the biodiversity. To achieve these effects the right plants known to the area should be used and plants should be used to create shadows onto the buildings. These plants should use their leaves during winter to let the sun come through during those times.

User experience and well-being

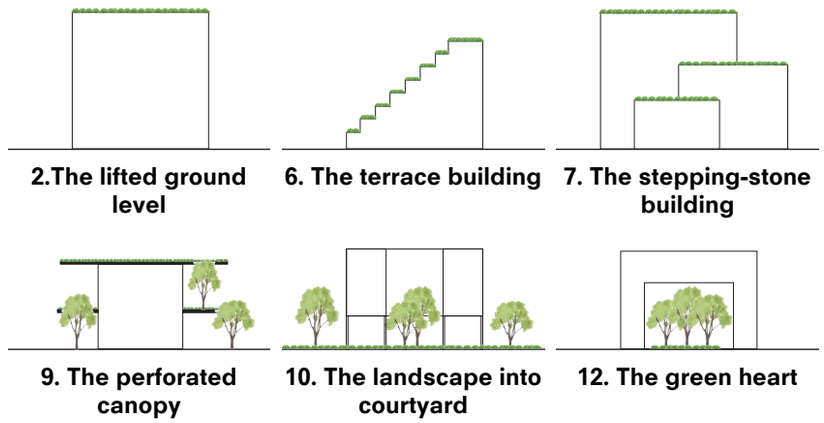
To not only have greenery present on/in the building and site, but also make it have a positive influence on well-being and user experience there are some requirements that need to be incorporated into the design: Having nature around for view and sound, using water features, using big openable façades openings for view, sounds & connection, using natural shapes/ patterns, using natural materials, creating a space to retreat, creating mystery and creating a thread with security.

Green systems fitting within the context

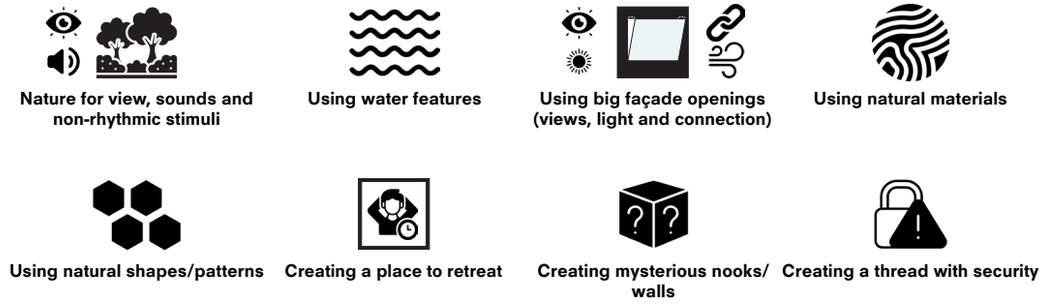
Considering the narrow site with archaeological ruins in a dense urban area of Milan there are some types of green systems that are more suitable than others. Within the characteristics of the city of Milan and its stone-like courtyard architecture green balconies, courtyards and roofs are most suitable. To create a symbiosis between architecture and nature green façades can be used as well, but mostly inside courtyards since the outer walls will be made of stone to connect with the surroundings. There are 6 types of green façades possible. To create a symbiosis between architecture and nature the greenery would have to be visible and so for green roofs the semi-intensive -, the intensive - and the plant box roof systems would be most suitable. For the balconies the extensive -, semi-intensive -, hanging garden -, plant-box -, and intensive balconies would be suitable, but should keep in mind that views are important as well, so there should be a combination of them. In order to make the symbiosis successful inhabitant plants and trees of Milan should be used and for this the plant and trees information cards should be used.

On the page on the right these design requirements for the design can be seen.

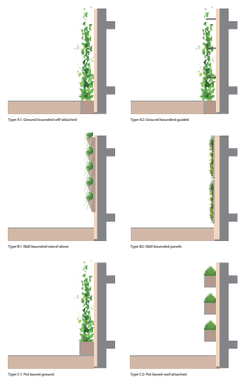
Nature-inclusive building types fitting within the context



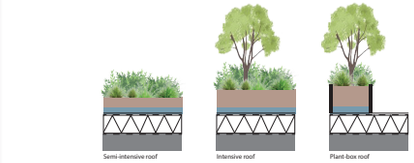
A positive user-experience



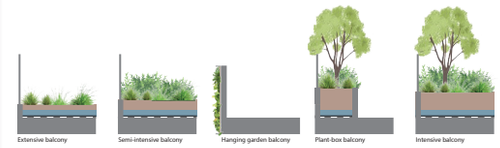
Green façades



Green roofs & balconies



Suitable classifications of green roofs for a symbiosis



Suitable types of green balconies without support

Suitable types of green balconies with support

Types of greenery

Plants & tree cards of Milan

CONCEPT

03

Site approach diagrams

The site approach starts with the master vision of restoring the green belt, which has an influence on the plot design. The design of the plot has different approaches that will also be taken into account.

<u>Restoring the green belt</u>

- Only pedestrians and cyclist
- No cars
- Blocking heavy traffic of cars
- Creating green longs
- Creating public meeting spaces
- Connecting the parks

The green knowledge hub will be an extension of the park and form an important node in the green network.

<u>Respecting the archaeology</u>
The present archaeology on the site should have a prominent space where it is present and can be looked at.

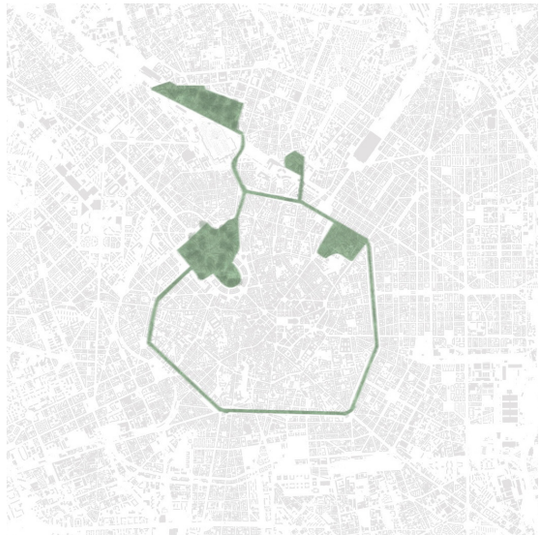
<u>Defining build-able areas of the plot</u>
Not every bit of the site is suitable for building. The outer sides should be green in order for the buildings to be located alongside greenery. Furthermore the archaeology and some space around it is not suitable to be built upon.

<u>Creating green axes</u>
In order for the green belt to work the green axes should be visible within the plot.

<u>Placing entrance zones according to surroundings</u>
The site should be approachable from the adjoining streets.

<u>Restoring old waterways</u>
Some of the old waterways will be restored as a remembrance of the history and for the biodiversity and green to work.

<u>Creating shade from the sun</u>
In order for the buildings to not become over heated the sun pathways are taking into account by having south facing façades hidden behind greenery as sun shading.



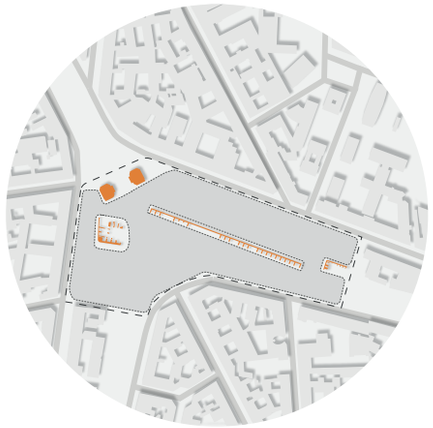
Green belt as long park around the city.

Pedestrian and cyclist zone.

The plot as an extension of the park and node in the park.

The green knowledge hub on the node.

Respecting and showing the old city walls.



Using the build-able area of the plot.

Park axes: creating a real green belt and connecting.

Opening up to the main entry points to the plot

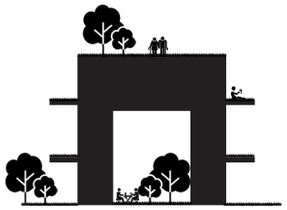
Restoring some of the old waterways.

Creating shading from heavy sun.

Design principle diagrams

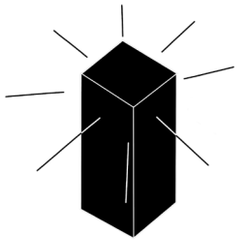
The research outcomes form a big influence for the design of the green knowledge hub. This informs the different design principles:

- Use-able green terraces
- Organic shapes
- Visibility
- Shareable spaces clustered
- Green heart as a connector
- Building in the constrained areas
- Respecting archaeology and connecting
- Becoming one with the landscape

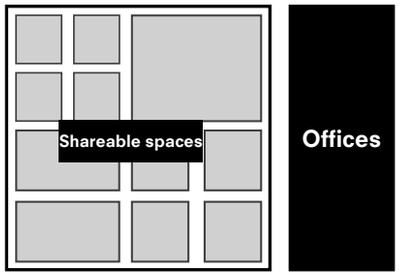


Creating use-able green terraces.

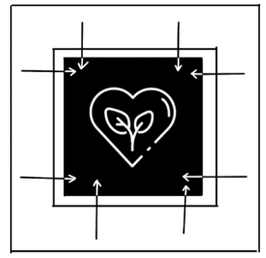
Using organic shapes.



Creating a visible (attraction point).



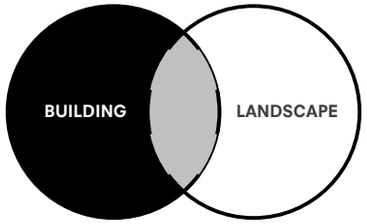
Shareable spaces clustered, offices ed further away for privacy.



Creating a green heart as a connector.

Building in the constrained areas.

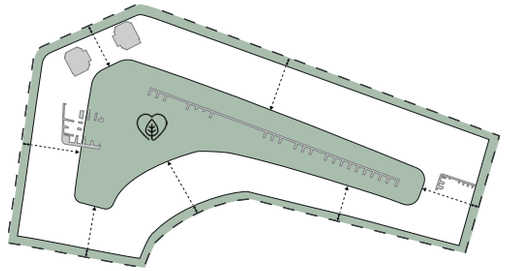
Respecting archaeology and connecting.



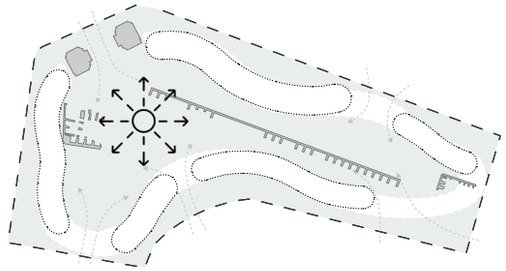
Becoming one with the landscape.

Concept diagrams

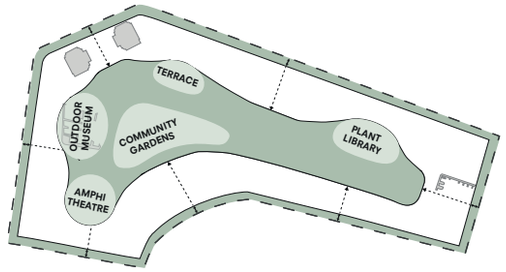
The concept is a symbiosis between architecture and nature, that has been translated into a relationship between buildings that are shaped to create a protected garden. “ To create a sheltered green oasis in the middle of the hardened and polluted city”. Within this oasis there is a place for the culture of greenery and events related to this, but at the same time a place to connect with the archaeology. Around this green heart the building shape is formed and building shapes are assigned to open up towards the surrounding streets to invite people inward. People are encouraged to walk through the gardens from one pavilion to another and therefore the entrances are located around the green heart. To be able to do this all year round and to create one entity bridges between the buildings are made. In the diagrams to be seen on the right the design steps can be seen.



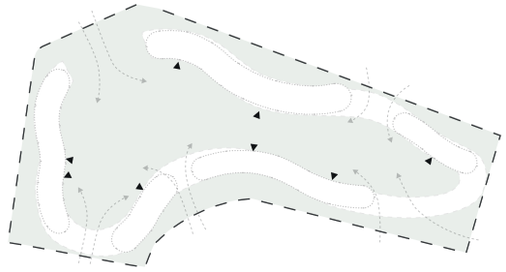
SYMBIOSIS I A PROTECTED GARDEN



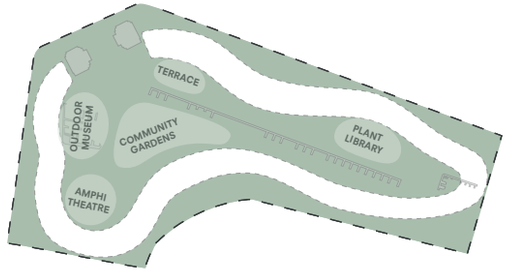
CREATING MOVEMENT I SPREADED VOLUMES



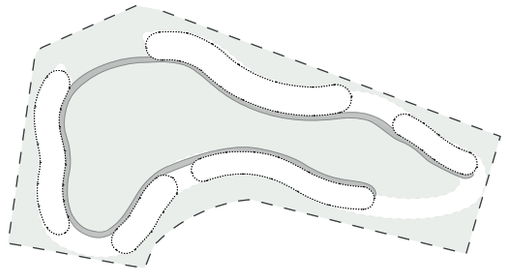
THE CULTURE OF GREENERY I GREEN CULTURAL EVENT SPACES



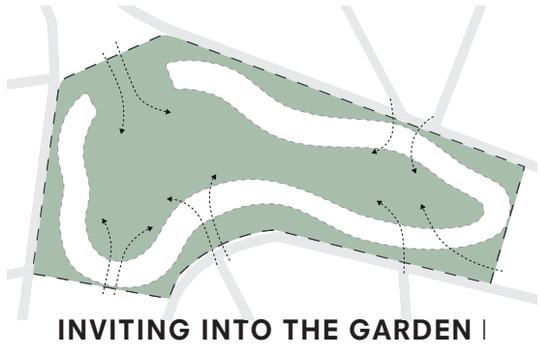
INVITING INTO GARDENS I ENTRIES FROM GARDEN SIDE



EMBRACING THE GARDEN I BUILDINGS AROUND GREEN HEART



CONNECTING I BRIDGES BETWEEN BUILDINGS



INVITING INTO THE GARDEN I OPENING UP TOWARDS GARDEN

DESIGN

04

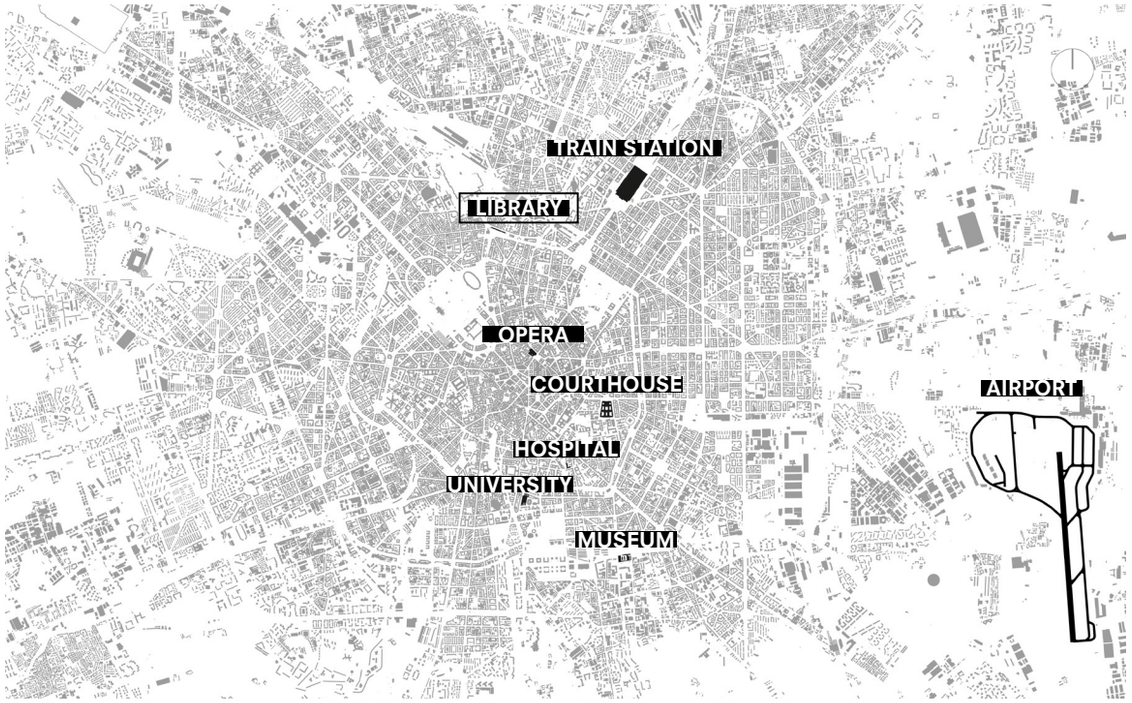
Drawing set

In the next paragraph the drawings will be shown with a scale bar.

Group site plan

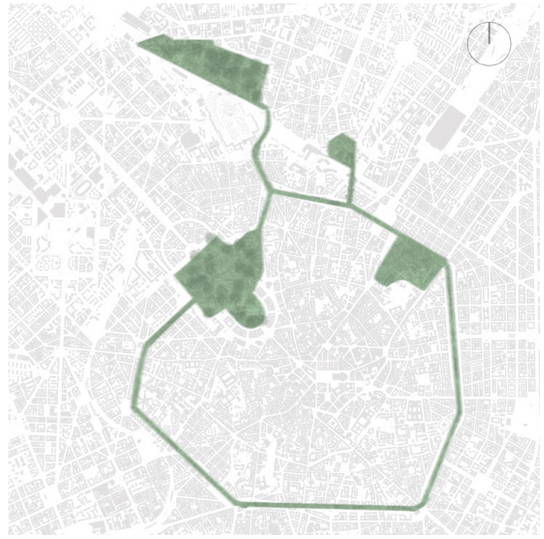
“As a world cultural capital, Milan is inextricably bound with the events culture. The city ends up in a state of continuous evolution changing based on its week, transforming itself into a ‘City of Temporality’. But as the power of the city grows, so does its cultural event-scape, bringing up issues of over-tourism, Disneyfication and overcrowding that are threatening Milan’s closed-off identity.
As a group of 8 buildings, we will focus on reversing this process with a strategy that will adapt to Milan’s “weekly” nature. In each of our building, we will be hosting all critical elements for the occurrence of the events. (Location, Audience, Advertising, Logistics, Content, Mobility) that will be complementary to each other, providing all the needs for the weekly event. With the deliberate integration of these spaces, we aim to achieve a more coherent urban context that energizes Milan’s built environment during events while maintaining its character.

The 8 designs demonstrate how these principles operate, illustrating the event-driven strategy that is capable of contributing to the city’s dynamism.”

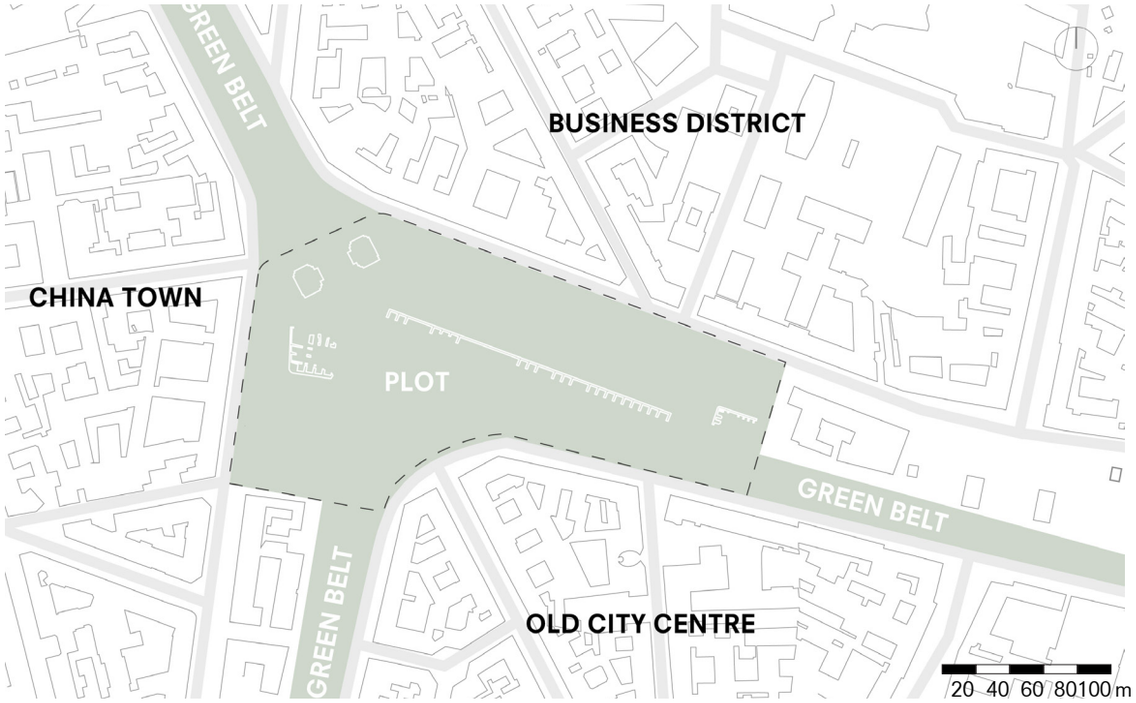


Urban implementation

Within this design the green belt of the city is emphasized by creating a green park around the city to block heavy trafficking towards the city centre and to create green lungs for the city.
The site is located on an important node connecting the city up to the northern part of the city and combining 3 green axes.



The green belt of Milan



Drawing set

Site plan

The buildings are located in different pavilions around the open site that hosts place for green cultural events. As a heart it has a community garden that allows inhabitants to reconnect with the culture of greenery. On the south side of the plot there is an amphitheatre for hosting conferences, concerts or community events.

On the west side along the museum there is an outdoor museum area that showcases the archaeology and allows people to walk through it. Alongside the main building there is a terrace that has a view on the gardens. More to the east near to the library offices there is a plant library to teach people about the domestic greenery.

SITE PLAN

01 **Community gardens**
02 **Outdoor museum**
03 **Amphi theatre**
04 **Terrace**
05 **Plant library**
06 **Playground**

6 12 18 24 30m

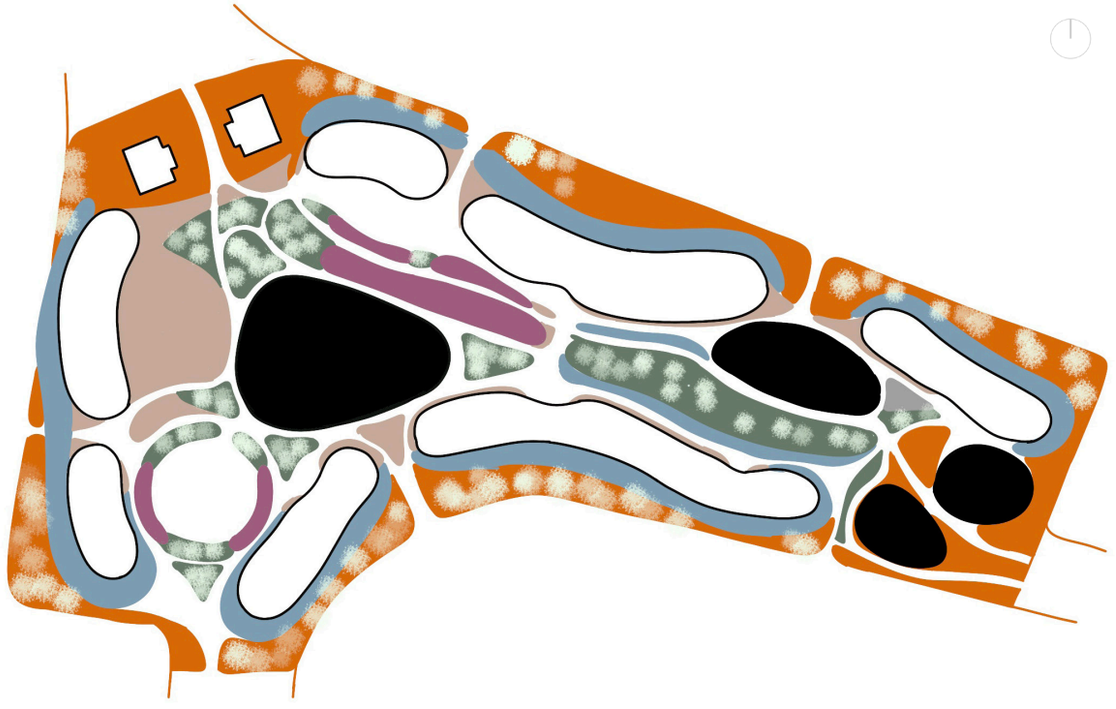
Drawing set

Plant zoning

On the site there are different zones of planting using the site known greenery of the research:

- The green buffer around the edges to shelter the plot from the surrounding streets with a mix of high (leave losing) and low plants (evergreen).
- Plants and trees near buildings that are lower and leave losing to let sun in during the winter and block the sun in summer.
- Lush greenery that is evergreen so that there are views on greenery all year round (mix of high and low).
- Greenery under the canopies that have to be lower due to hight restrictions of the canopies and for views.
- Greenery in the middle of the plot that is lower to keep views on the culture of greenery.

In the figure on the right it can be seen where these zones are.



GREEN BUFFER

MIX OF HIGH (LEAVE LOSING) AND LOW (EVERGREEN)

Trees	Plants
Common fig	Common box
Lemon tree	White stemmed bramble
Field maple	Rodondendron
Common hazel	Arrowwood dawn
Sycamore	Box honeysuckle
	Black mondo
	Switch grass 'Shenandoah'

LUSH GREENERY FOR VIEWS ON GREEN

HIGH AND LOW EVERGREEN PLANTS AND TREES FOR GREEN YEAR ROUND

Trees	Plants
Olive tree	Common box
Oleander	White stemmed bramble
Bay laurel	Rodondendron
Lemon tree	Arrowwood dawn
Rubber tree	Box honeysuckle
Common hazel	Black mondo
	Switch grass 'Shenandoah'

NEAR BUILDINGS

LOW MIX OF PLANTS FOR YEAR ROUND GREEN & LOW LEAVE LOSING TREES

Trees	Plants
Pomegrenate	Aromatic aster
Cherry blossom	Hybrid geranium
Cherry plum	Poppy
Rose of sharon	Japanese azelea
Common holly	Pendylvania sedge
Lemon tree	Blue star kalimers
	Betony
	Black mondo

UNDER CANOPIES

LOW MIX OF PLANTS FOR YEAR ROUND GREEN

Trees	Plants
None	Aromatic aster
	Hybrid geranium
	Poppy
	Japanese azelea
	Pendylvania sedge
	Blue star kalimers
	Betony
	Black mondo

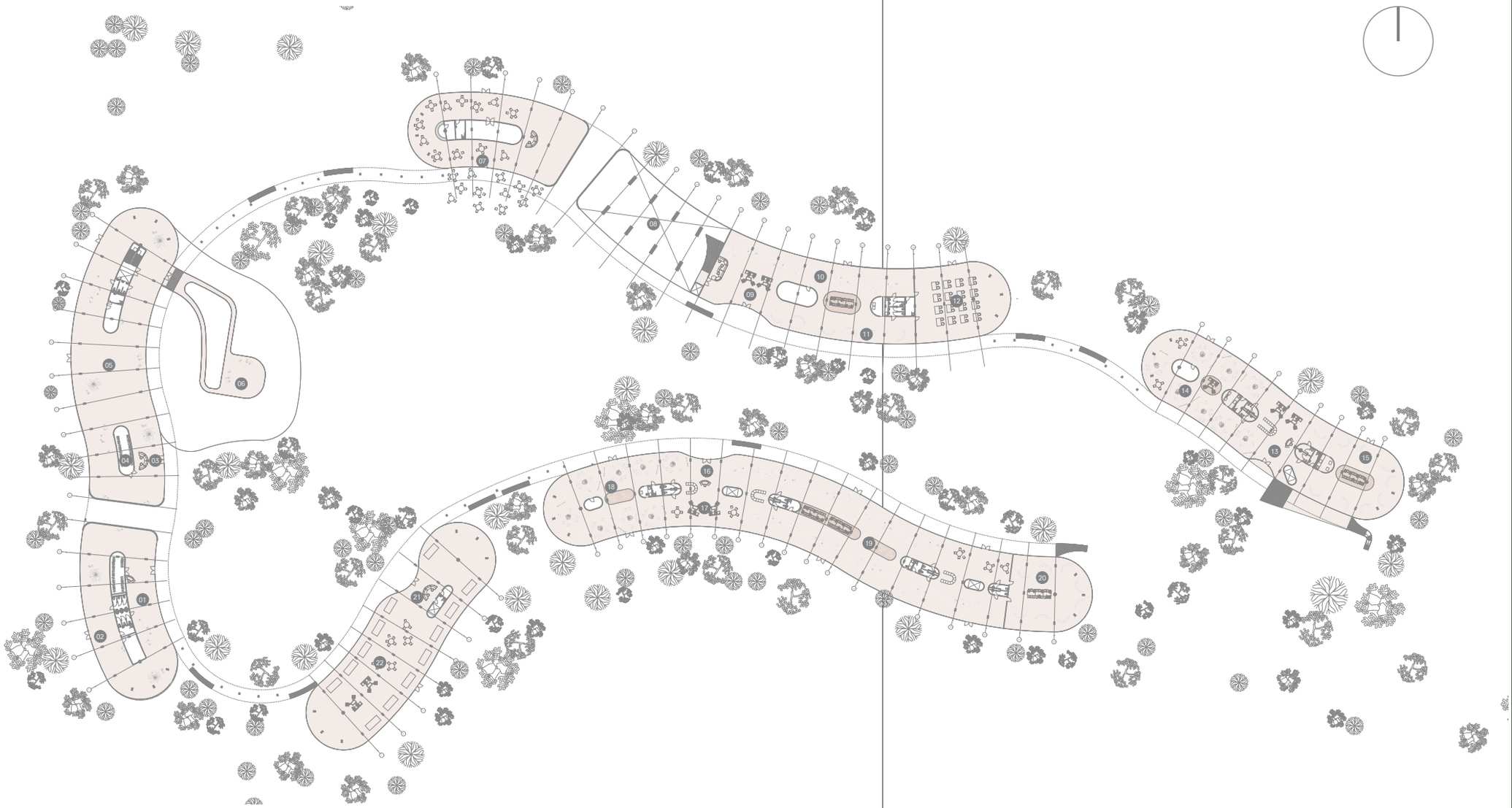
LOW GREENERY FOR VIEWS

MIX OF PLANTS FOR YEAR ROUND GREEN, BUT LOW FOR VIEWS ON CULTURE

Trees	Plants
None	Aromatic aster
	Hybrid geranium
	Poppy
	Pendylvania sedge
	Blue star kalimers
	Betony
	Black mondo

Drawing set

Floor plan | ground floor

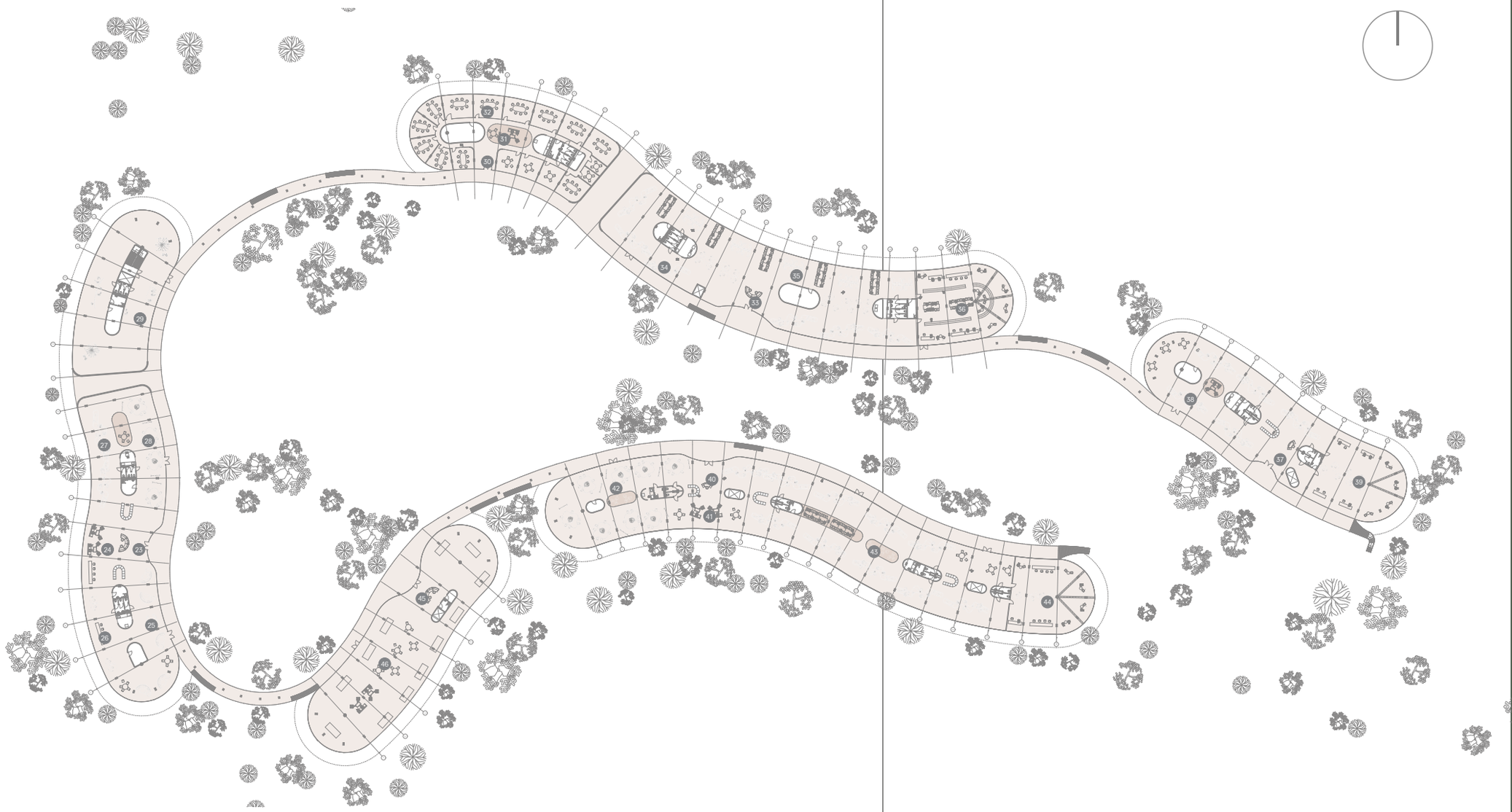


01 Entrance temporary exhibitition
02 Temporary exhibitition
03 Entrance museum
04 Wardrobe museum
05 Museum
06 Outdoor museum
07 Café/bookstore
08 Multifunctional hall (void)
09 Entry shared ammenities
10 General study area
11 Consultation study area
12 Classroom
13 Entry fondazione Feltrinelli
14 Informal meeting area
15 Brainstorm area
16 Entry Microsoft offices
17 Waiting area
18 Informal meeting area
19 Open workspace
20 Brainstorm area
21 Entry Microsoft experience
22 Microsoft showroom

6 12 18 24 30 m

Drawing set

Floor plan | first floor

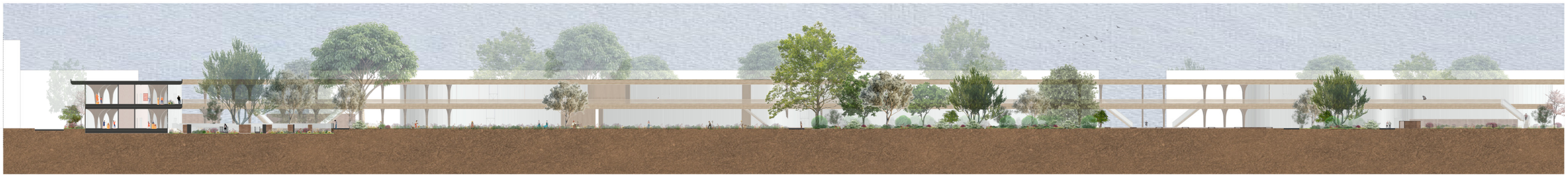


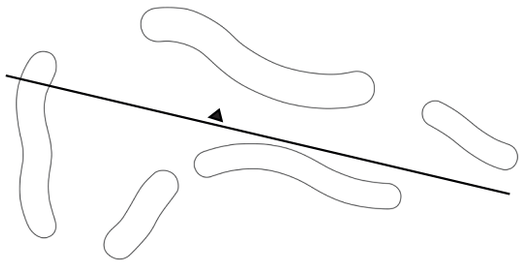
23 Entrance offices museum
24 Waiting area
25 Brainstorm area
26 Concentration area
27 Open workspace
28 Informal meeting area
29 Exhibition hall
30 Entry meeting rooms
31 Waiting areea meeting rooms
32 Meeting rooms
33 Entry study areas
34 General study area
35 Quiet study area
36 Reading room
37 Entry fondazione Feltrinelli
38 Open workspace
39 Concentration area
40 Entry Microsoft offices
41 Waiting area
42 Informal meeting area
43 Open workspace
44 Concentration area
45 Entry Microsoft technology centre
46 Microsoft technology centre

6 12 18 24 30 m

Drawing set

Sections

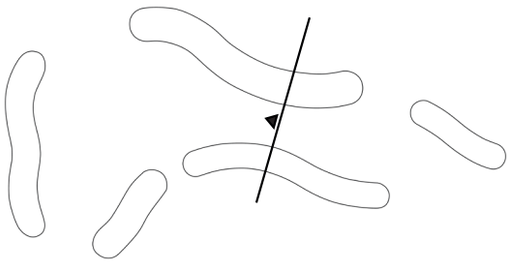




10 20 30 40 50 m

Drawing set

Sections



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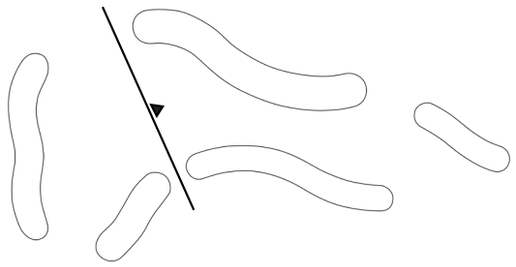

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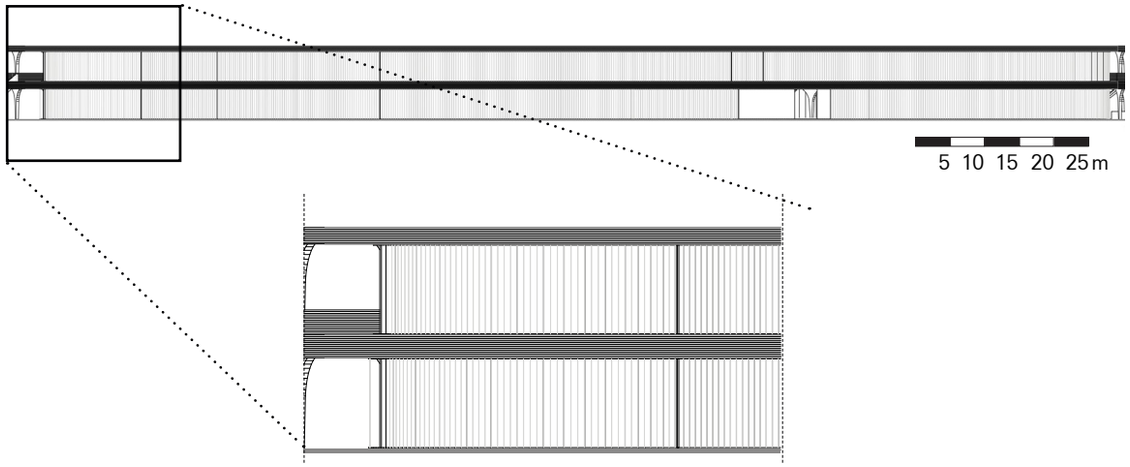
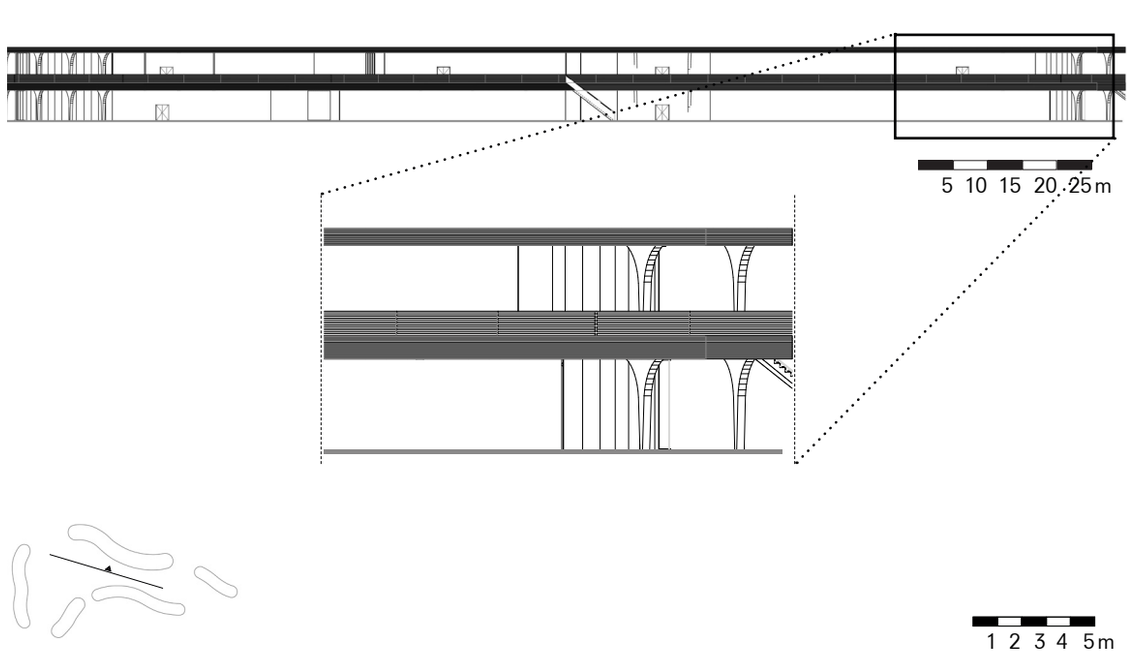
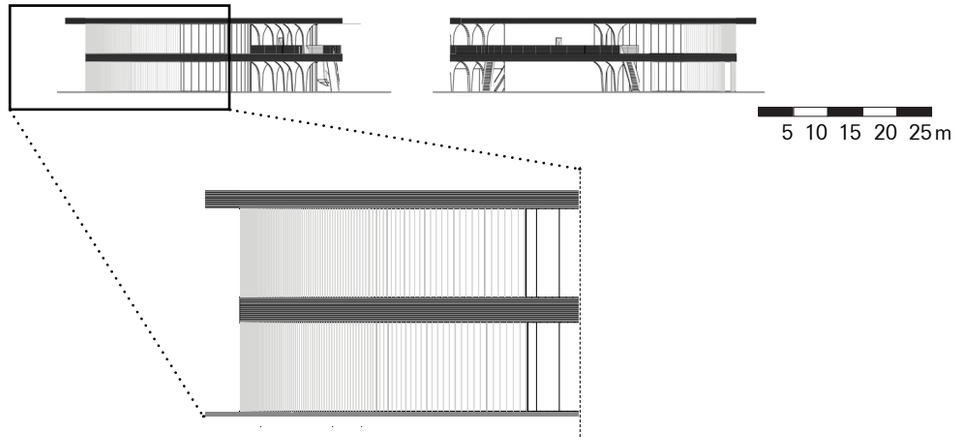
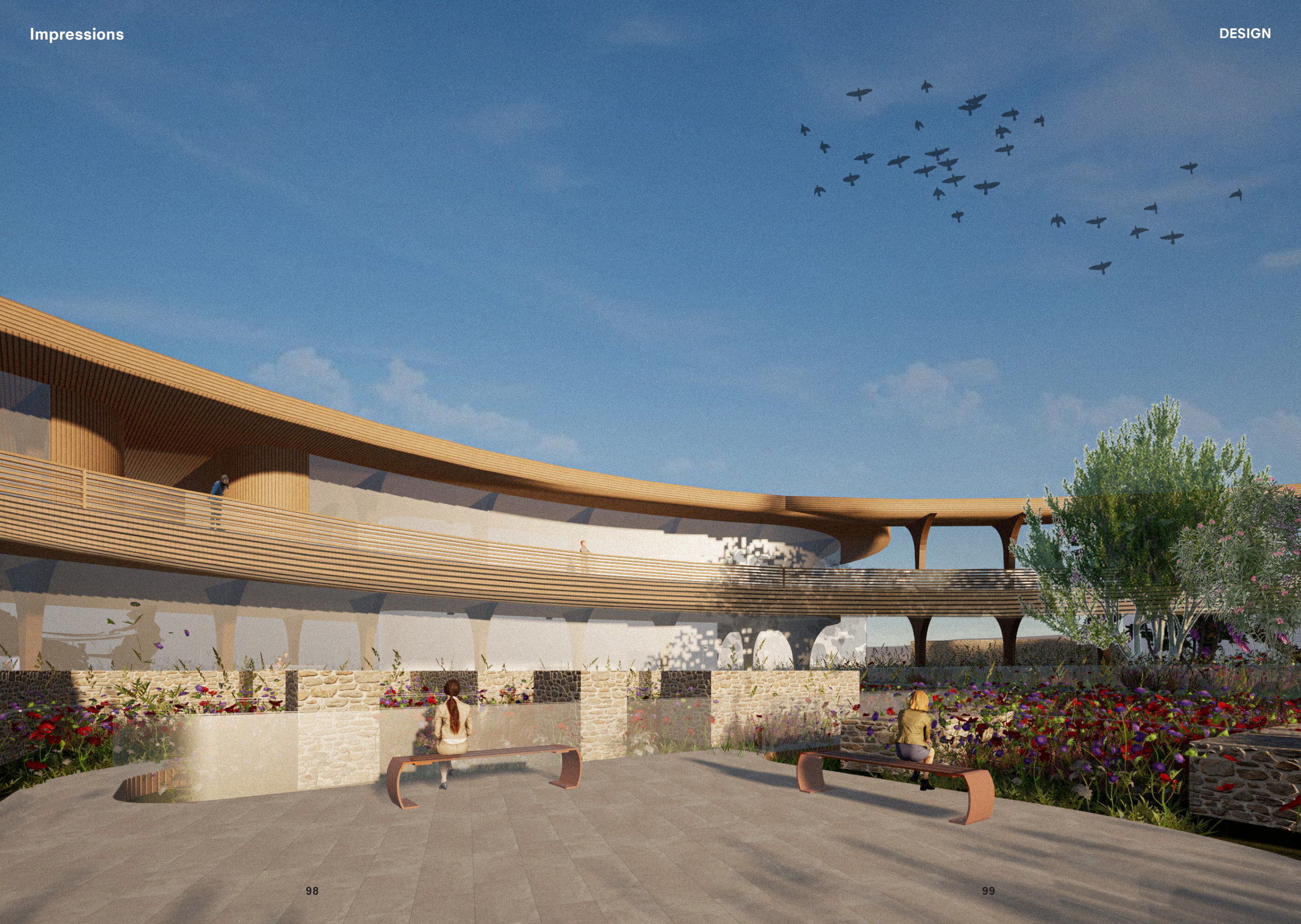
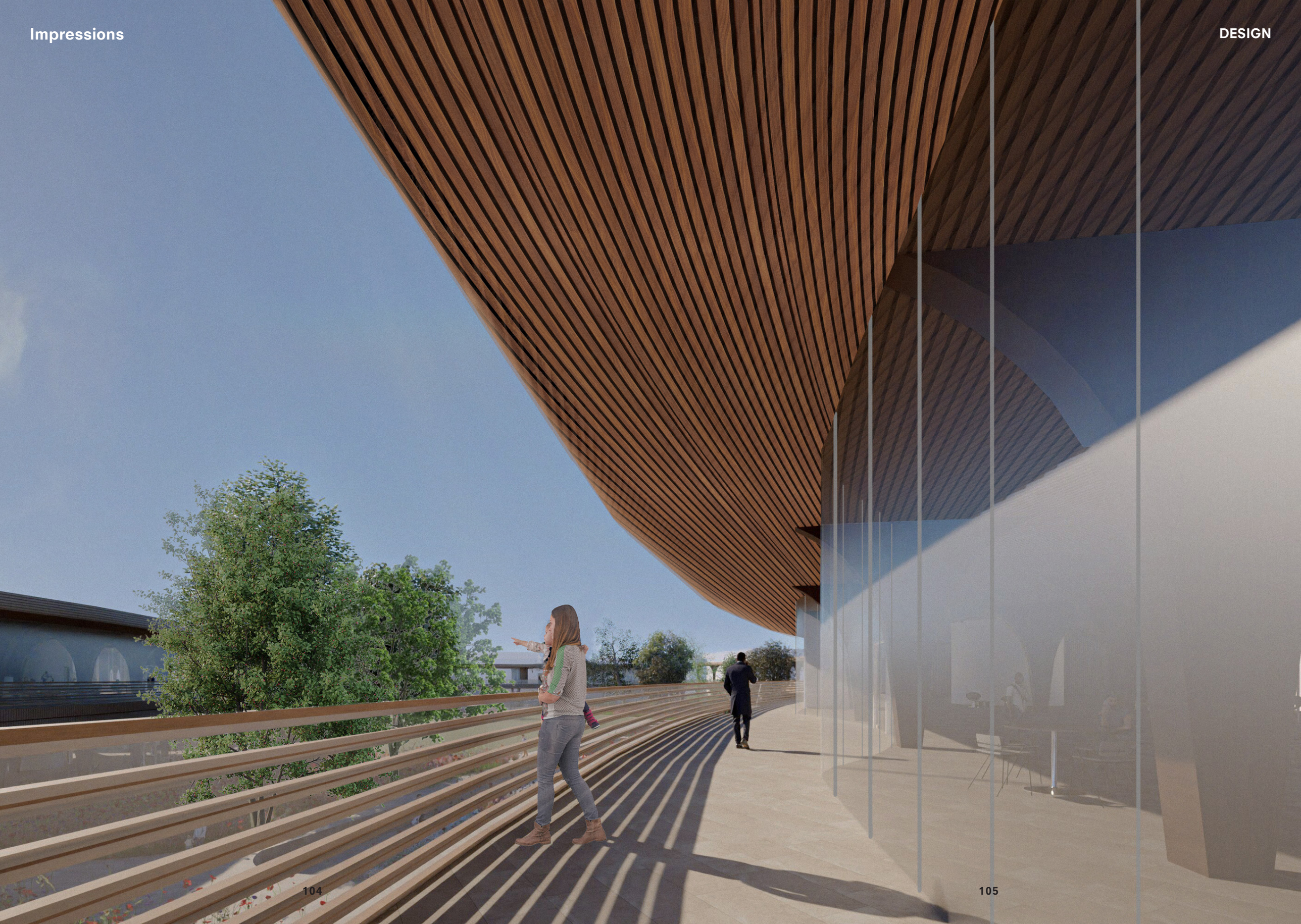
Elevations











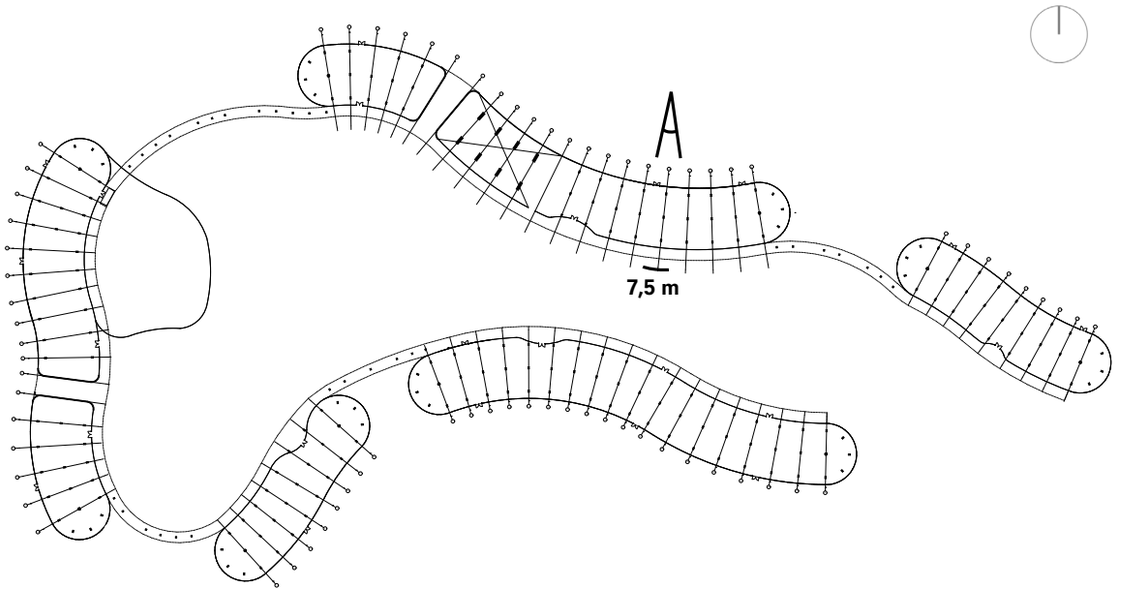
TECHNICAL DEVELOPMENT

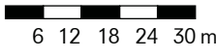
05

Structure

Construction plan

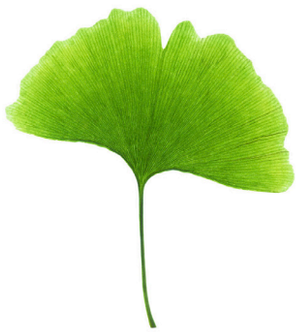
In order to create the organic shapes but still making it possible to build the building itself repeating constructions are used. These are placed under an angle to make the organic shapes possible. This has been done in a way that the maximum span is 7,5m and so the building can be created from wooden floors and theredore consits out of natural materials like the research has initiated.





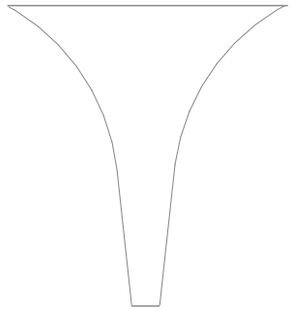
Structure

The structure of the project is also referring to natural shapes and resembles the ginkgo leave, and is translated into an organic shaped column. This column is repeated along the edges and in the middle of the building. It references trees on the inside emphasizing the indoor outdoor connectioin

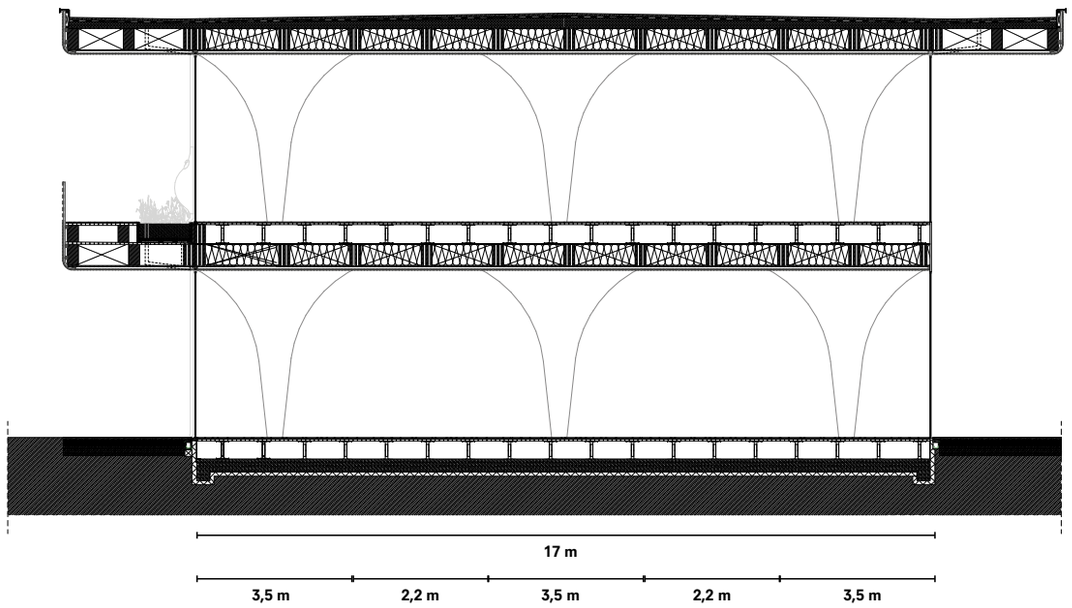


GINKGO LEAVE | NATURAL SHAPE

CONTOURS OF GINKGO SHAPE

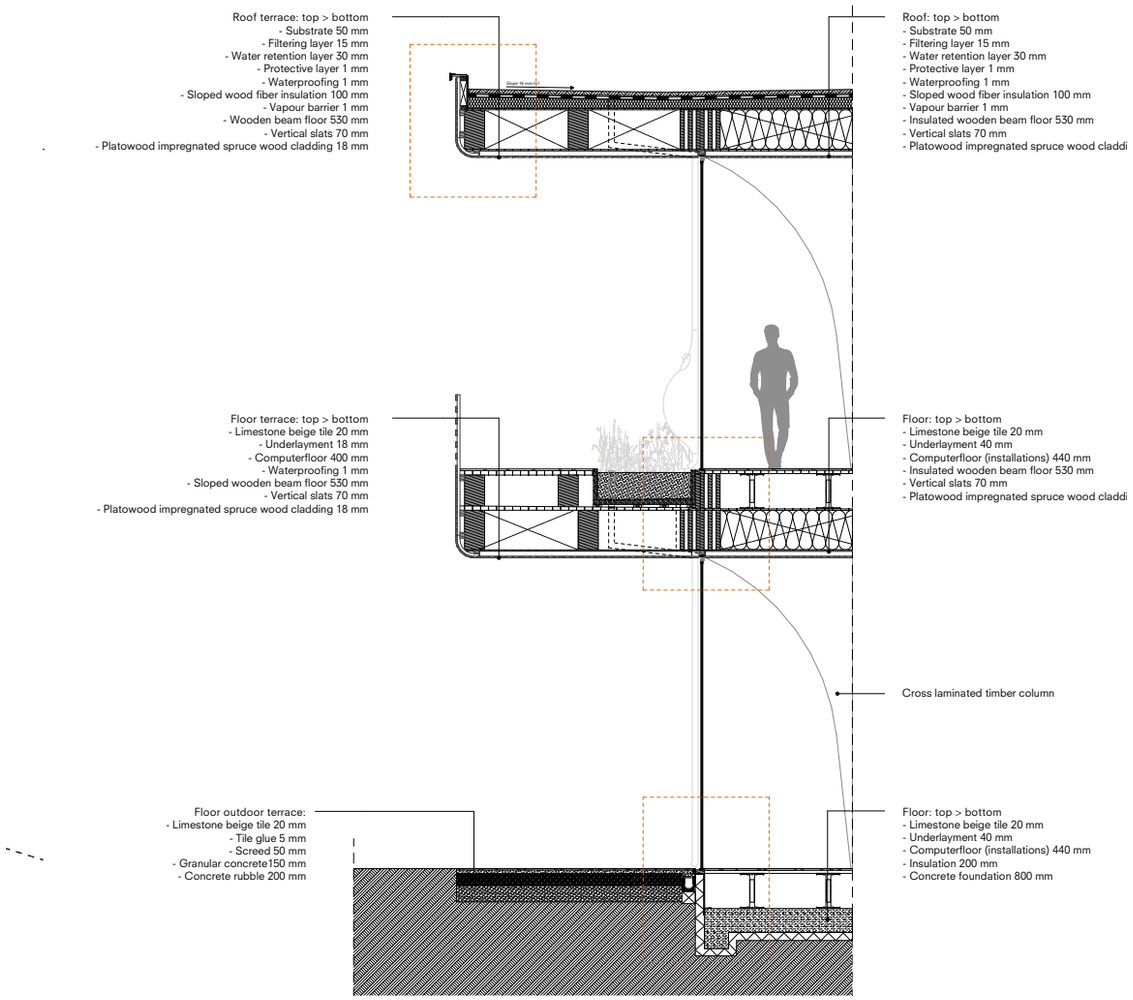


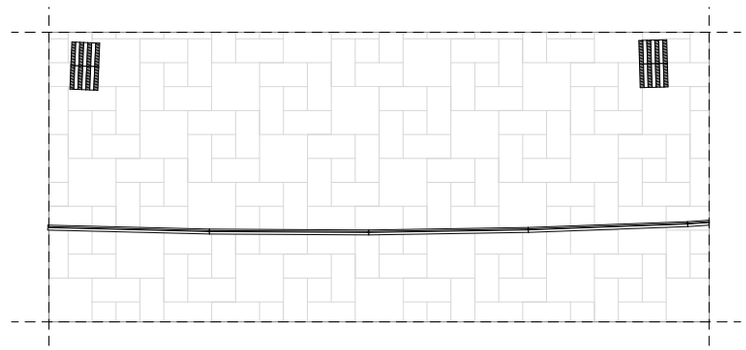
TRANSLATING TO CONSTRUCTION CONTOURS ORGANIC SHAPED COLUMN

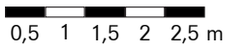


Structure in the building section

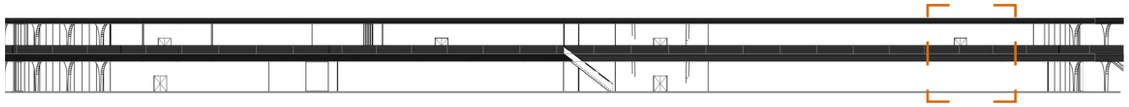
Structure







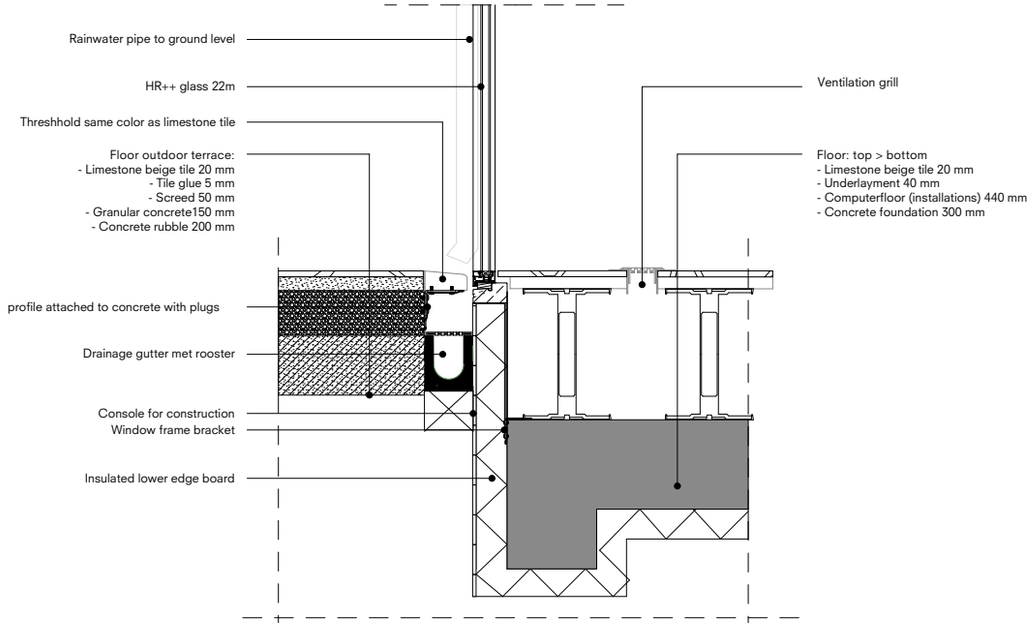
Structure in the facade

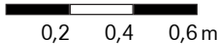


Location of structure in the facade

Facade structure perspective

Details





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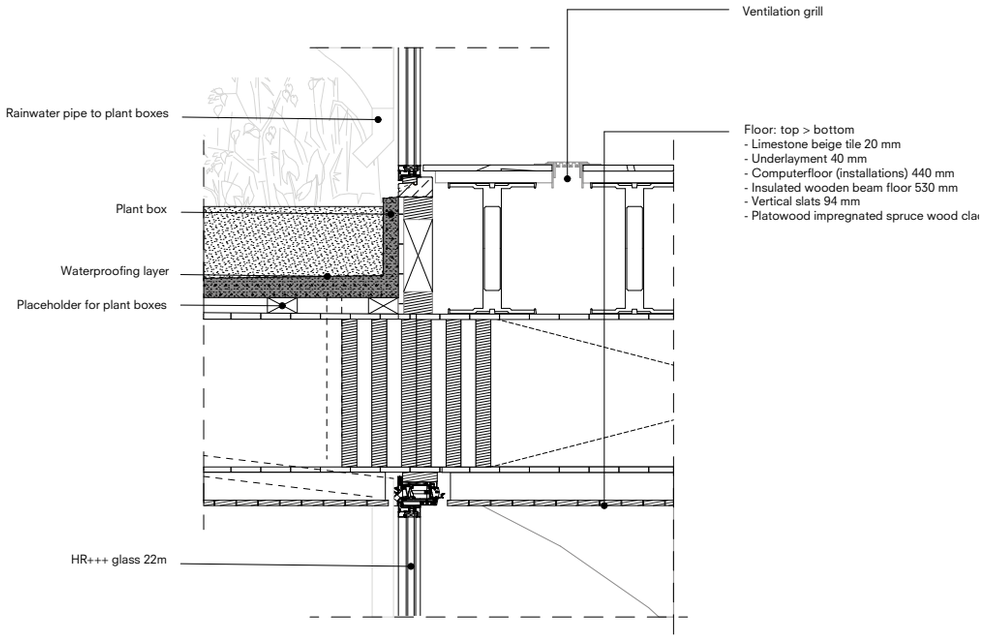
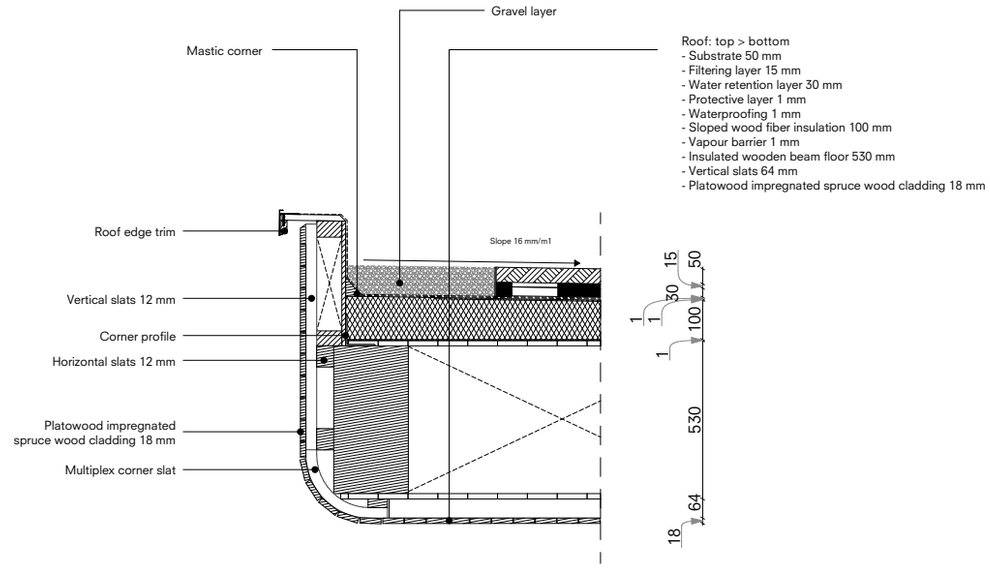


0,2 0,4 0,6 m

120

m

Details



0,2 0,4 0,6 m

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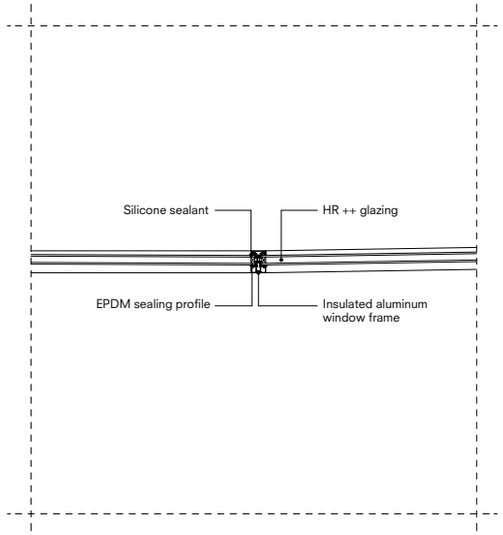
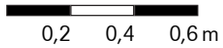
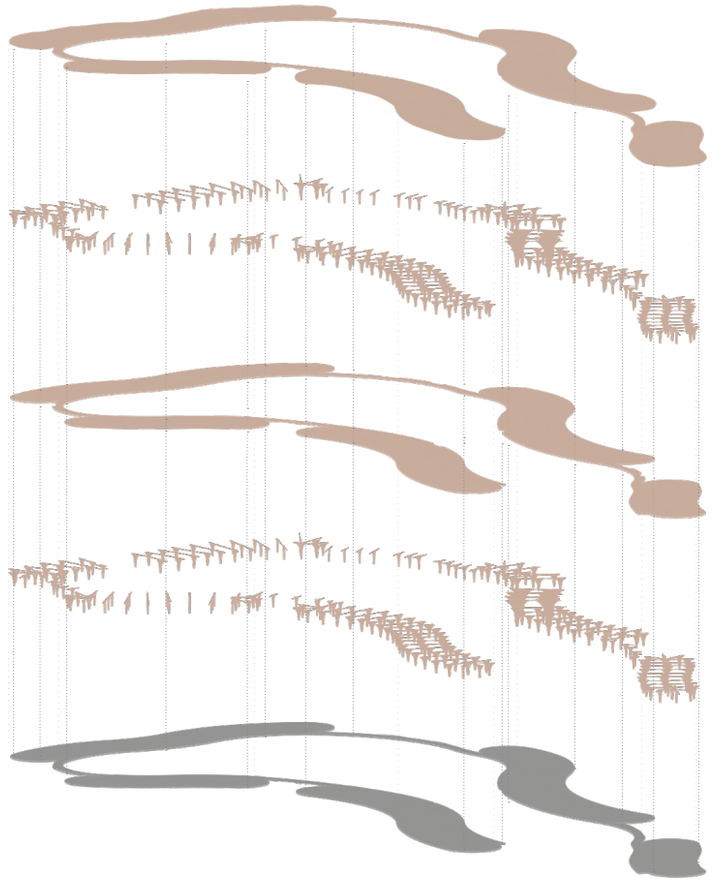






Wooden roof
Creates stability together with colums and beams.

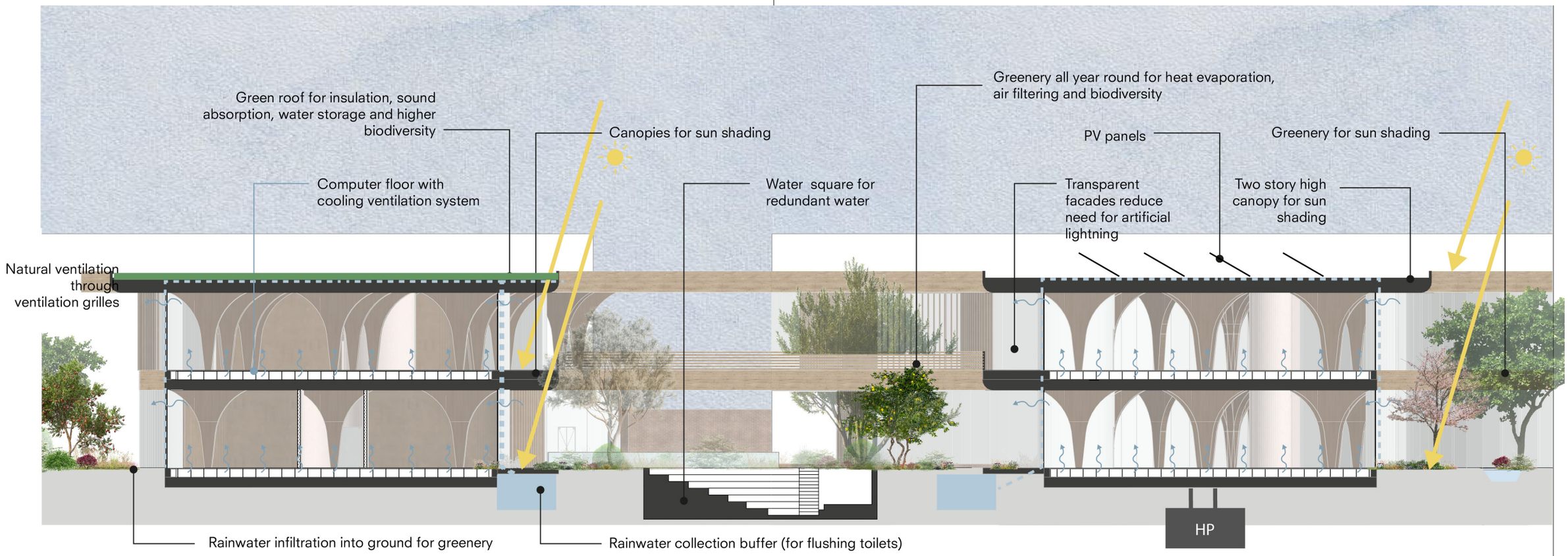
Columns and beams
Allows for large spans and organic shapes

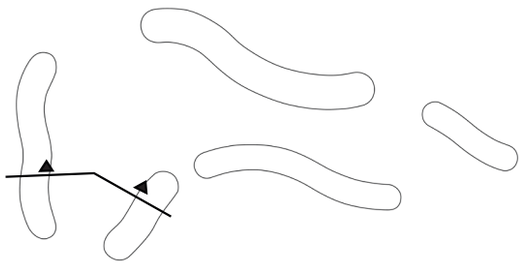
Wooden floor
Creates stability together with colums and beams.

Columns and beams
Allows for large spans and organic shapes

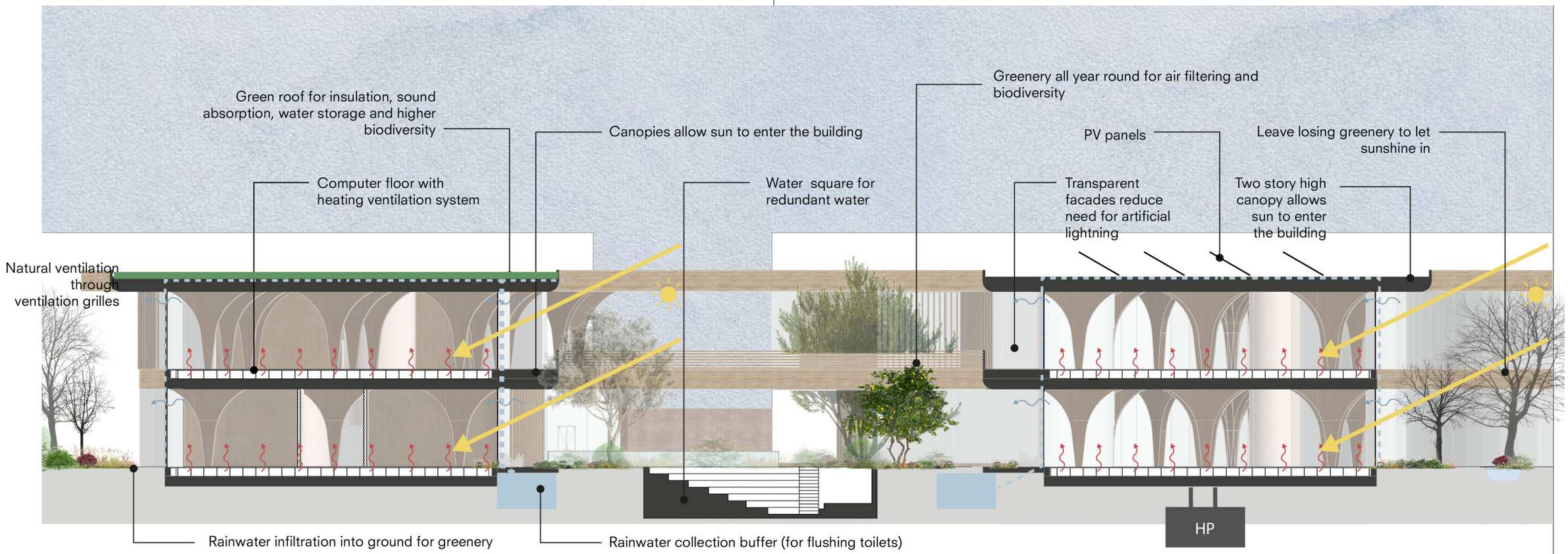
Concrete foundation
Connected to ground for stability

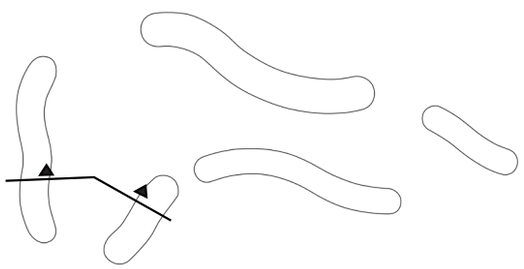
Rotated columns and beams connected by floors make the construction stable.


Green roof for insulation, sound absorption, water storage and higher biodiversity
Canopies for sun shading
Greenery all year round for heat evaporation, air filtering and biodiversity
PV panels
Greenery for sun shading
Computer floor with cooling ventilation system
Water square for redundant water
Transparent facades reduce need for artificial lightning
Two story high canopy for sun shading
Natural ventilation through ventilation grilles
HP
Rainwater infiltration into ground for greenery
Rainwater collection buffer (for flushing toilets)



2 4 6 8 10 m


Green roof for insulation, sound absorption, water storage and higher biodiversity
Canopies allow sun to enter the building
Greenery all year round for air filtering and biodiversity
PV panels
Leave losing greenery to let sunshine in
Computer floor with heating ventilation system
Water square for redundant water
Transparent facades reduce need for artificial lightning
Two story high canopy allows sun to enter the building
Natural ventilation through ventilation grilles
HP
Rainwater infiltration into ground for greenery
Rainwater collection buffer (for flushing toilets)



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REFLECTION

06

Reflection

Aspect 1 | The relationship between research and design

Within the research the focus was based on creating a relationship between architecture and nature in order to promote user experience and well-being of the users. The design is a translation of this in a way that the greenery plays a central role in the design and that the users are encouraged to go outside and meet in the nature, while the building itself emerges from nature by organic shaped structures and fading
The design is a translation of the research outcomes that blurs the lines between the indoor and outdoor through the connection of the indoor and outdoor in terms of program; but also by creating transparency between the both and having terraces as transitional zones like researched.

Aspect 2 | The relationship between graduation topic and studio topic

The studio topic is 'human scale'. Over the years the perception of human scale is changed from nature to man made constructions. "Modern constructions are often dominated by the use of human-made materials, artificial lighting, processed air, and sensory-deprived environments with little connection to the culture or ecology of the places where they occur" Kellert, S. R. (2018)
A symbiosis between architecture and nature, also known as biophilic design, helps to make environments more connected to nature and make the human scale more site specific. This specifically is relevant to the bodies and building studio of Complex designing a 'one of' building that is of a big scale and explores the relation between users and buildings. It bridges the gap between architecture and the human scale.

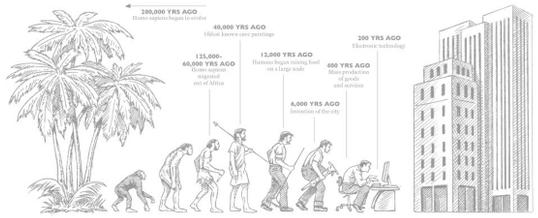

Figure 82 : Humans disconnecting from nature.

Aspect 3 | Research method and approach chosen by the student in relation to the graduation studio

The research methods given by the complex projects studio are: site, client, program, and a lens (in this case culture). This research was done simultaneously with the thesis topic research of greenery that was done through case studies, desk and literature studies. To combine both and make it project specific the thesis research was projected onto the studio research methods of client, program, site and lens:

- The types of nature inclusive buildings have been researched through literature research and case studies and where related back to what is possible on the given site.
- The lens and client research were combined into a research showing how the culture of Milan can be enriched by greenery and what this would mean for the current clients and how this could add new clients.
- The greenery that should be implemented into the project should be able to flourish in Milan and therefore domestic greenery has been researched by a site visit and desk research.
- The presence of greenery in the project changes the relationships in the programmatic functions and is therefore implemented into the relationship scheme.

All in all the graduation studio methods were used and enriched by the influence of the thesis topic research and methods.

Aspect 4 | Relationship between the graduation project and the wider social, professional and scientific relevance

Cities are heating up, polluting and becoming urban heat islands. This all can lead to serious health problems, Giuffrida (2024) states the following: "Poor air quality was linked to 50,303 premature deaths in Italy in 2020, according to the EEA. Most were in Milan, but Cremona in Lombardy was the Italian province with the highest proportion of deaths – between 150 and 200 per 100,000 residents – attributed to PM 2.5". Greenery can be a solution to these problems since it can clean the air and help reduce heat and so more urban nature is needed in the city of Milan. In this case the research is projected onto the city of Milan, but essentially the research can be applicable onto other case studies and help the architectural world become more biophilic and therefore restore balance between man (made) and nature in the built environment.

Aspect 5 | Ethical issues and dilemmas you may have encountered during graduation

The concept of this project is based on encouraging people to go outside and improving their well-being and experience though having different pavilions in a green park with routing between both. This can add to a positive lifestyle and improved well-being but can also be challenging for people with physical disabilities and the elderly who are vulnerable to weather conditions. This challenged the ideal concept of fully being outdoors and inclusiveness and health for all and therefore a midway had to be created by having the pathways between the buildings covered and creating elevators inside the buildings after all. This does not add to the ideal concept of a healthy lifestyle within the greenery but is needed for inclusiveness. This shows that sometimes a concept or idea cannot be executed fully like intended but can be executed with other measures in order to create the same idea but make it feasible.

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07

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Figures

- **Figure 1:** Made by author.
- **Figure 2:** Hobson, B., & Hobson, B. (2022, January 10). Deputy mayor of Paris joins Dezeen x MINI Living panel to discuss the future of the French capital. Dezeen. https://www.dezeen.com/2017/09/05/deputy-mayor-jean-louis-missika-dezeen-mini-living-talk-future-paris/
- **Figure 3:** Made by author.
- **Figure 4:** Made by author.
- **Figure 5:** Made by author.
- **Figure 6:** Almusaed, A. (2011). Biophilic and bioclimatic architecture. London: Springer-Verlag London.
- **Figure 7:** Made by author.
- **Figure 8:** DP Città Resilienti, Direzione Transizione Ambientale, Commune di Milano. (n.d.). A green and resilient Milan.
- **Figure 9:** Made by author.
- **Figure 10:** Fondazione Giangiacomo Feltrinelli. (2024, May 8). Observatory on Ideas and Practices for a Sustainable Future - Fondazione Giangiacomo Feltrinelli. https://fondazionefeltrinelli.it/en/osservatorio/observatory-on-ideas-and-practices-for-a-sustainable-future/
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- **Figure 18:** Made by lens group adapted by author.
- **Figure 19:** Made by lens group adapted by author.
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- **Figure 77:** Made by author.
- **Figure 78:** Picture by author. Made at tree library BAM, Milan.
- **Figure 79:** Picture by author. Made at tree library BAM, Milan.
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Appendixes

Appendix 1: Magazine

COMPLEX PROJECTS P0.5

BUILDING ANALYSIS

Library | Fondazione Feltrinelli

Babette Duijvestein
Sam Haverhals
Roos Broeksma

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ABOUT MILAN

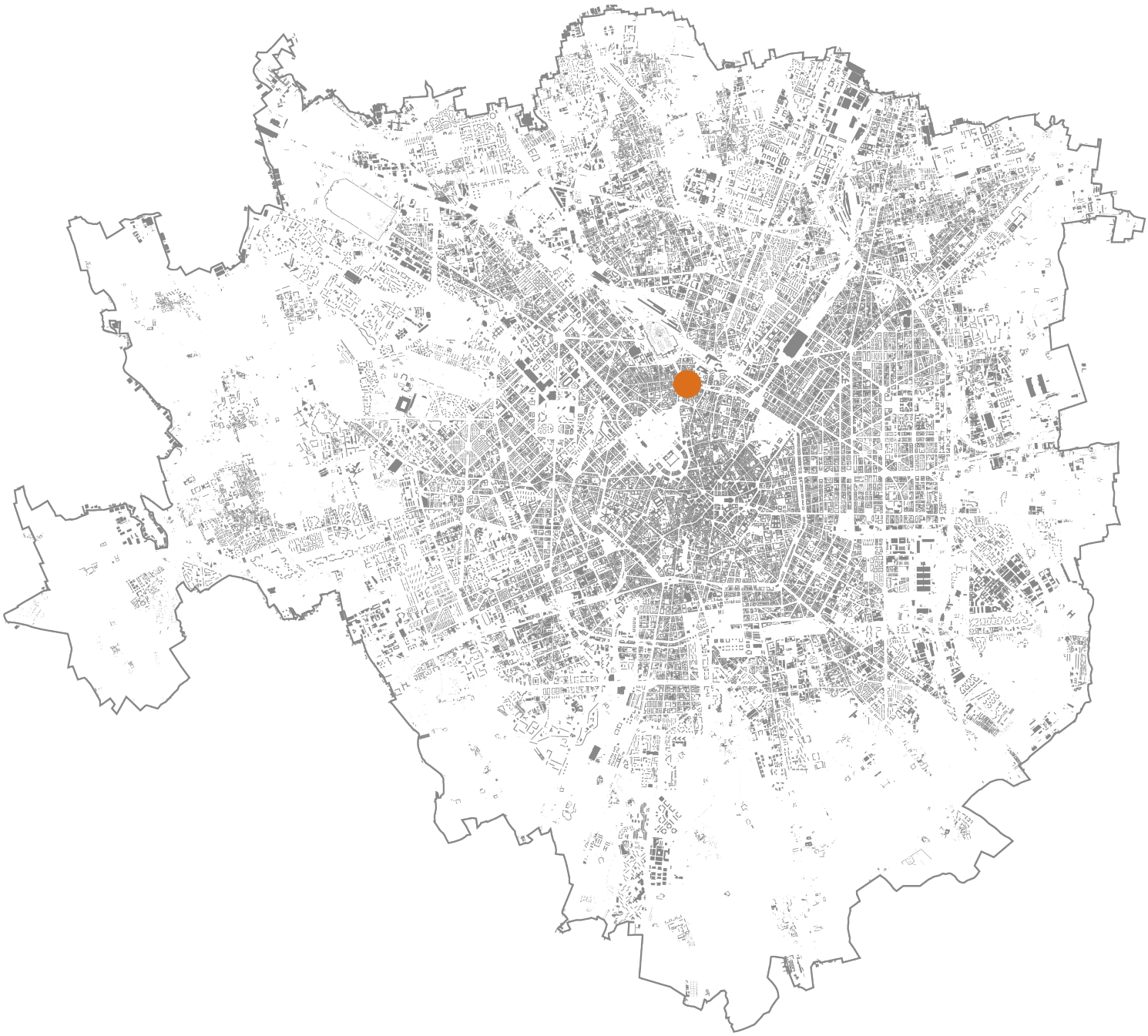
Milan is located in **Lombardy** in the north of Italy. It is the second biggest city of Italy with 4 million inhabitants. The city is almost **2600 years old.** From 286 till 402 it used to be the capitol city of the roman empire. Around 1500 the city was captured by the French. Later on the Spanish concured it and ruled the city. After that it was in the hands of Austrians and French again until 1861 it belonged to Italy again. During World war II the city was bombed multiple times, but built itself up really quickly, which resulted in a fast growing economy. Therefore multiple guest workers came to Milan and stayed there, resulting in Milan being a **multicultural city** (milaantop10, sd).

Location of Milan on the map by Roos Broeksma

Picture of what Milan is about nowadays by Roos Broeksma

Nowadays the city is known for Architecture (heritage & modern), art, fashion, football, the stock market and furniture & design.

THE LOCATION OF THE



Location of the library on the map of Milan by Roos Broeksma

LIBRARY

Photo of the sightlines towards the building by Filippo Romano

Map of the neighborhood and surroundings by Roos Broeksma

Tomba di Manzoni museum

Cimitero Monumentale di Milano

ADI design museum

Milano Porta Garibaldi Passante

Piazza Gae Aulenti

Museo della Permanente

Arco della Pace

Parco Sempione

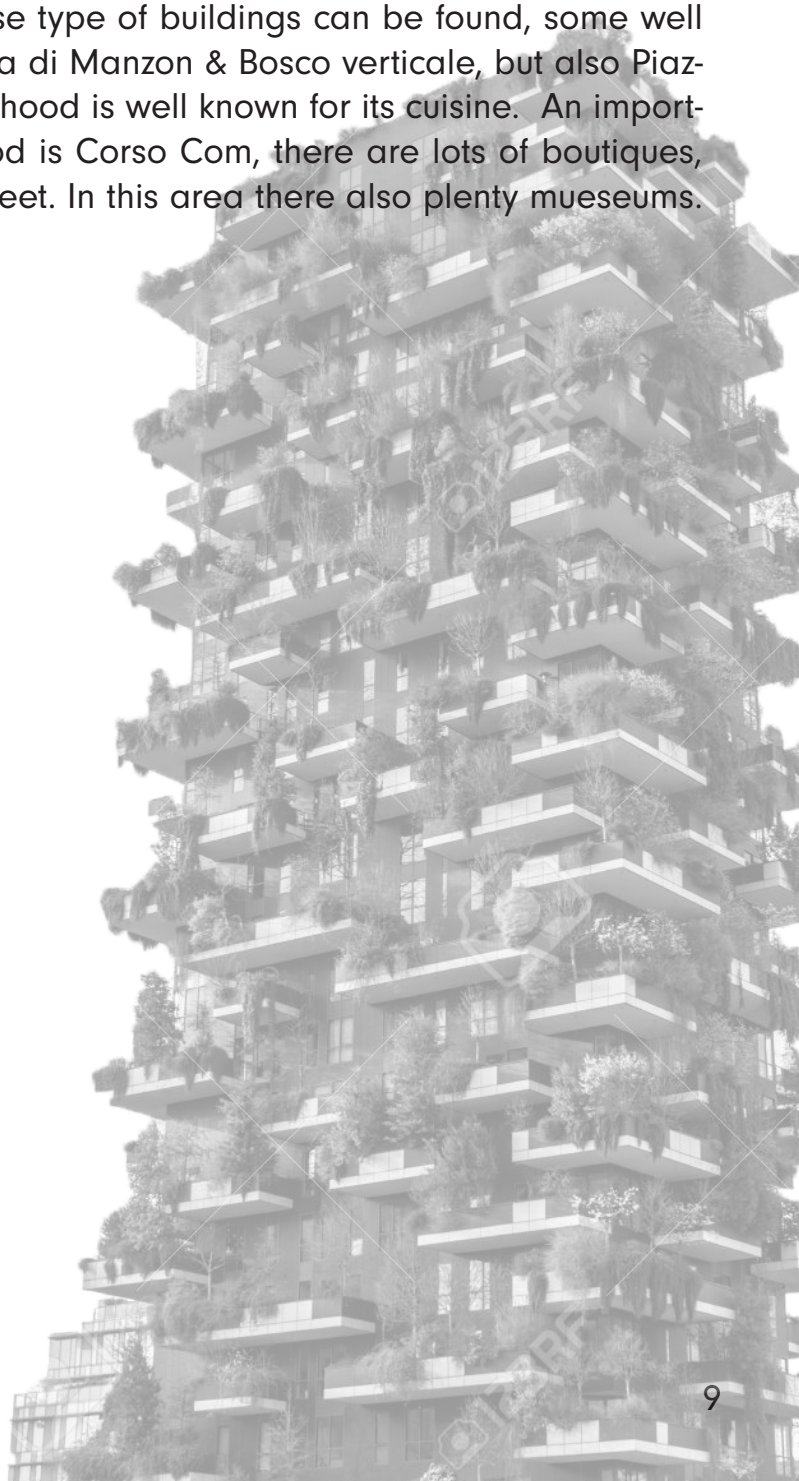
THE NEIGHBOOD

PORTA GARIBALDI

The library Foundazione Feltrinelli is located in the neighbourhoods Porta Garibaldi.

> *"Garibaldi is one of the trendiest neighbourhoods in Milan, known for its fashionable vibe and vibrant energy. The area is named after the famous Italian general Giuseppe Garibaldi, who played a key role in the unification of Italy. Today, the neighbourhood is home to a mix of historic buildings, contemporary architecture, and trendy boutiques."*
>
> *– (thenestmilan, sd).*

In this neighbourhood a diverse type of buildings can be found, some well known buildings are the Tomba di Manzon & Bosco verticale, but also Piazza Gae Aulenti. The neighbourhood is well known for its cuisine. An important street in the neighbourhood is Corso Com, there are lots of boutiques, restaurants and bars in this street. In this area there also plenty mueseums.



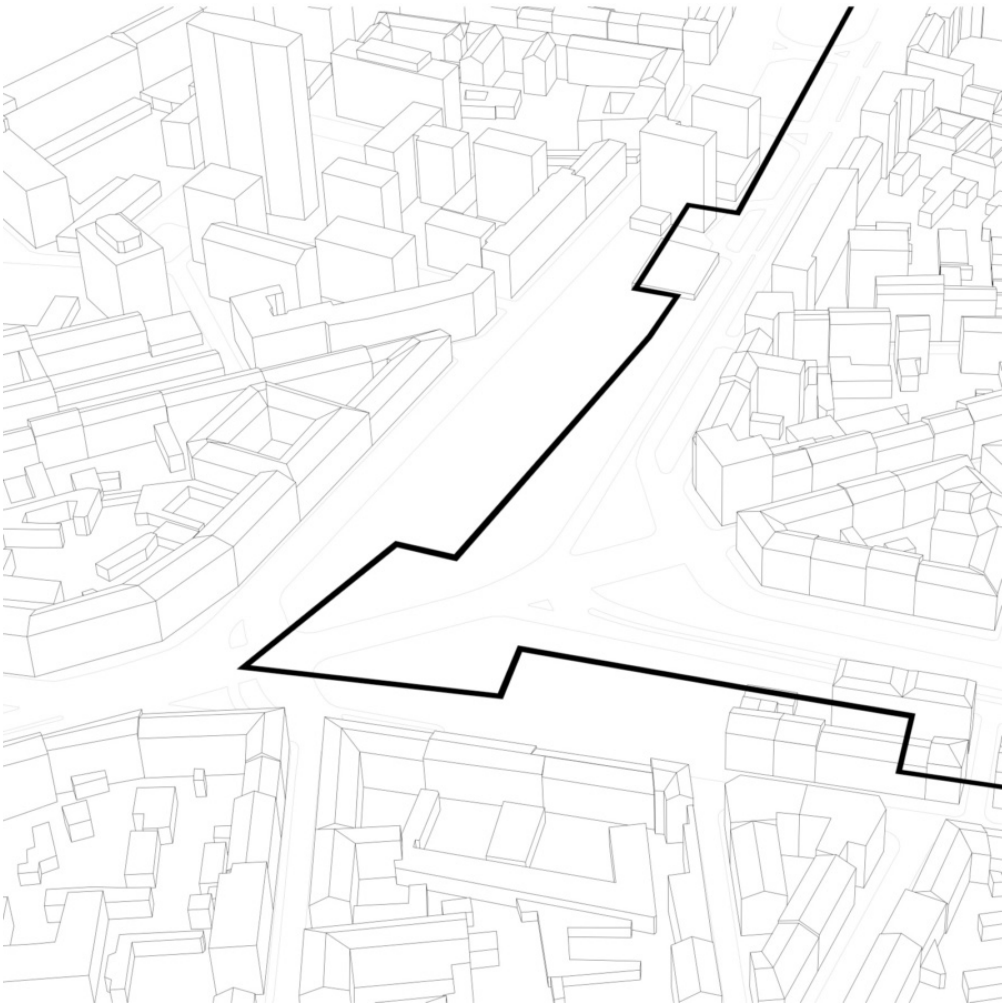
THE OLD CITY WAL

The Spanish walls

On the location of the Fondazione Feltrinelli library used to be a city wall: Mura Spagnole. These city walls date back to the time Milan was in the hands of the Spanish and represent a piece of history that way.

The gates of Porta Volta

The gates of the city wall are still to be seen: Gates of Porta Volta. This specific Port was build around 1880. The doors and gates were removed, but the toll houses are still remaining (visititaly.com, sd).



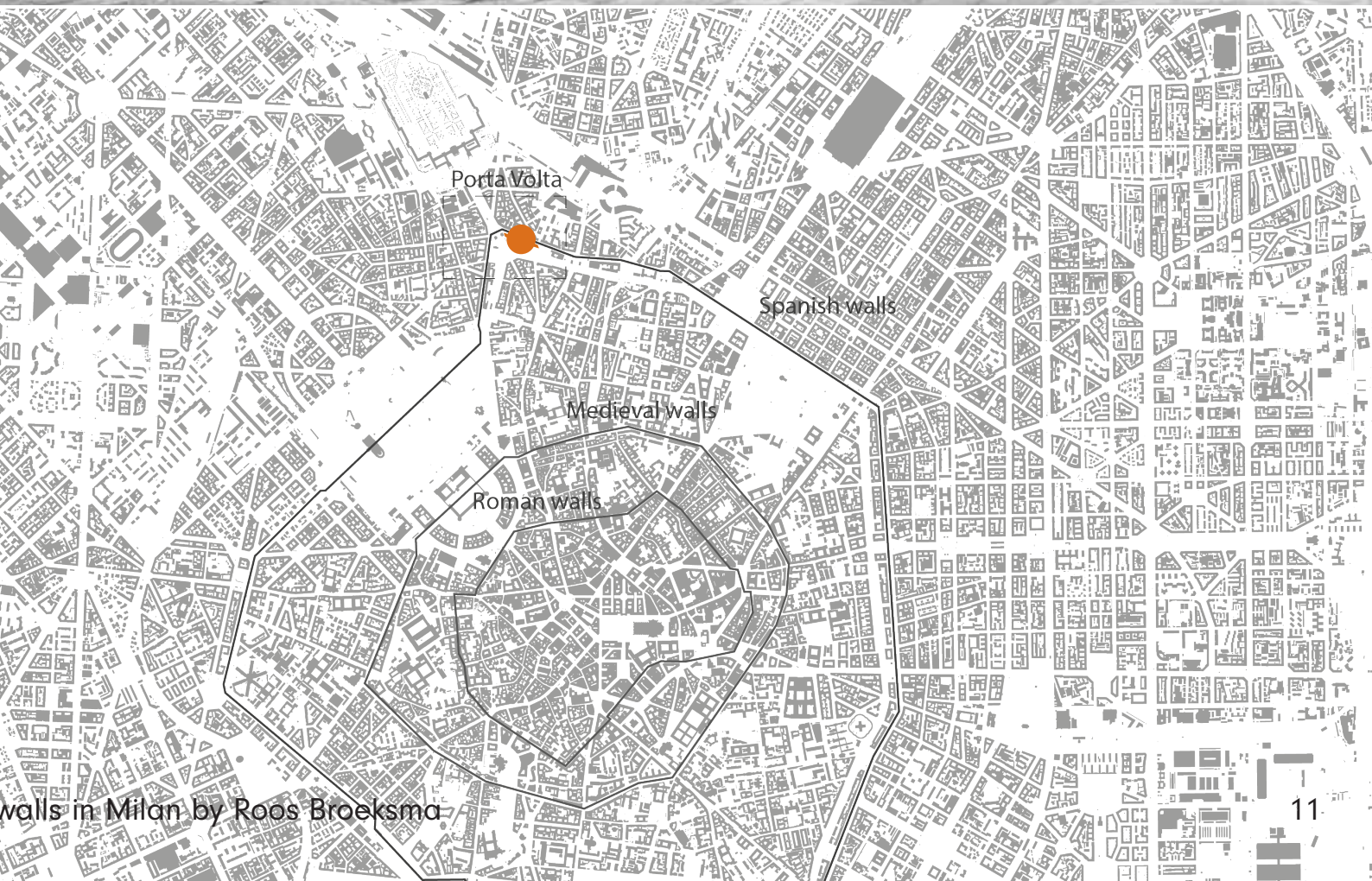
Site diagram of where the Spanish walls used to be by Herzog-demeuron

The toll houses of Po

Map of the old city w

LLS

rta Volta (visititaly.com, sd).



walls in Milan by Roos Broeksma

FONDAZIONE

LOCATION	Milan, Italy Viale Peasublo 5
FUNCTION	Library
CLIENT	Foundation Feltrinelli
ARCHITECT	Herzog & de Meuron
PROJECT	2008 - 2011
REALISATION	2011 - 2016

FELTRINELLI *PORTA VOLTA*

Herzog & de Meuron

Herzog & de Meuron is a renowned Swiss architecture firm founded in 1978 by Jacques Herzog and Pierre de Meuron. Known for their innovative use of materials and distinctive designs, the duo has created a diverse range of projects, from residential buildings and museums to stadiums and public spaces. Their approach combines functionality with artistic expression, often incorporating elements that reflect the cultural or historical context of the site. Signature works include the Tate Modern in London, the Bird's Nest Stadium in Beijing, and the Elbphilharmonie in Hamburg. In 2001, they were awarded the prestigious Pritzker Architecture Prize.

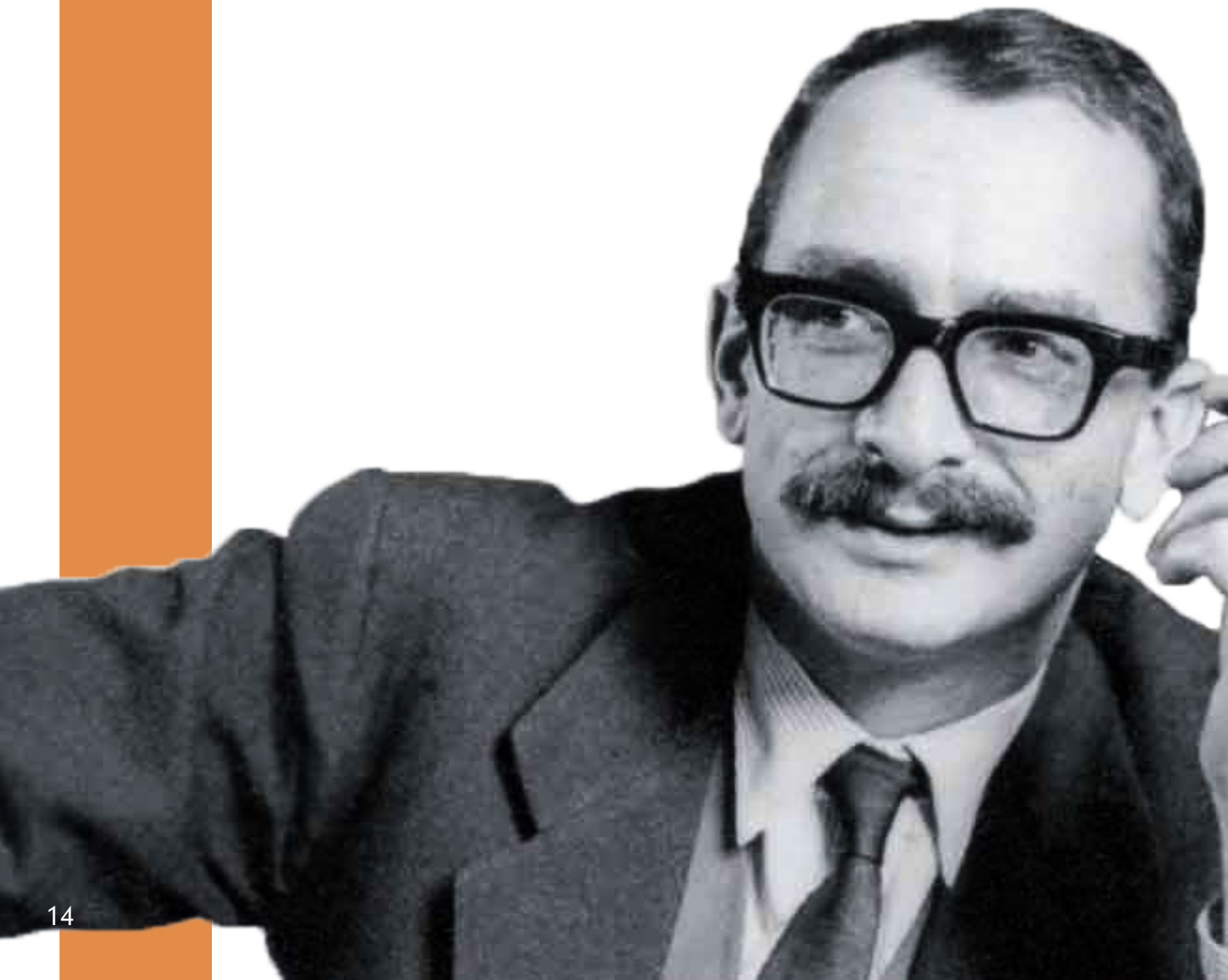
Design of the Feltrinelli Library

The main idea behind Herzog & de Meuron's design of the Feltrinelli Library in Milan was to create a building that offers a modern interpretation of the local architectural tradition. They aimed for a timeless design that integrates into the urban fabric of Milan while serving as a functional public space for knowledge and culture. Their design emphasizes clean, linear forms, natural materials, and transparency, creating an open and inviting environment
Feltrinelli is a library located on Viale Pasubio in Milan, Italy. This street is part of the Circonvallazione Interna, an important traffic route running parallel to the city's historic Spanish walls. Viale Pasubio is situated between two former city gates: Porta Garibaldi and Porta Volta.

Feltrinelli

Through the years

The library houses an exceptionally valuable collection of books and archives, assembled from 1949 by **Giangiacomo Feltrinelli**, after whom the library is named. The collection focuses on the history of the labor movement and the democratic movements of the Italian Risorgimento. Initially, the collection was intended solely for preservation and was not accessible to the public. After Giangiacomo Feltrinelli's death in 1972, the institution was granted Foundation status by a presidential decree in 1974. This led to increased attention to the housing of the collection. Vittorio Gregotti was commissioned to design a building on a plot of land owned by the Feltrinelli family. This building was intended to house the collection and also provide space for events and public debates.



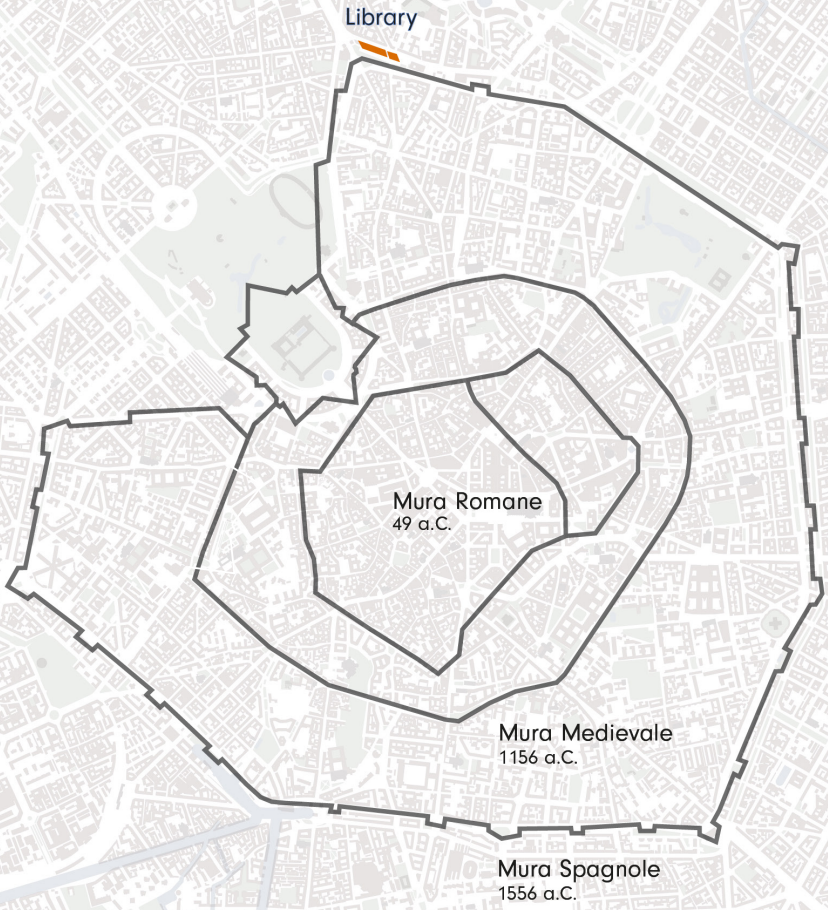
Although this project was not realized, Giangiacomo's son, Carlo Feltrinelli, took the initiative to enlist the architectural firm Herzog & de Meuron for a new design. This building was constructed along Viale Pasubio on a site that follows the trace of the sixteenth-century Spanish walls. This area has always played a significant role in Milan's urban development. The walls were demolished in the latter half of the 19th century, allowing Viale Volta to connect the city with the monumental cemetery, where the Famedio serves as an entrance.

Carlo Feltrinelli
Fondazione Giangiacomo Feltrinelli, 2016

Creating culture, for ***Giangiacomo****, meant being an active part of change*

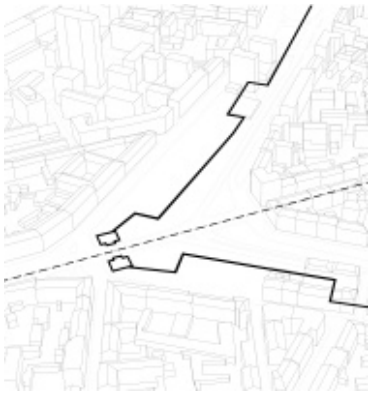
Giangiacomo Feltrinelli
Fondazione Giangiacomo Feltrinelli, 2016

SITE *Analyses*

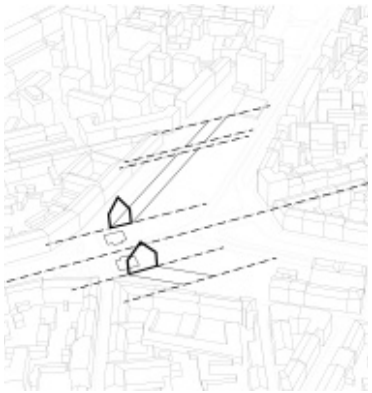


City walls of milan
Own illustration

Spanish walls



Caselli Daziari, 1880



Geometric study

Masterplan
Herzog & de Meuron, z.d

The Feltrinelli Library is designed as a modern reference to Milan's old city walls and aligns with the Caselli Daziari, the historic city gates. As shown in the figure below, the long building runs parallel to Viale Pasubio, following the line from the eastern of Porta Tenaglia. With a length of 188 meters, it evokes the impression of a new city wall and shields a public park from the road, in harmony with the existing trees. This creates an extension of the existing boulevards.

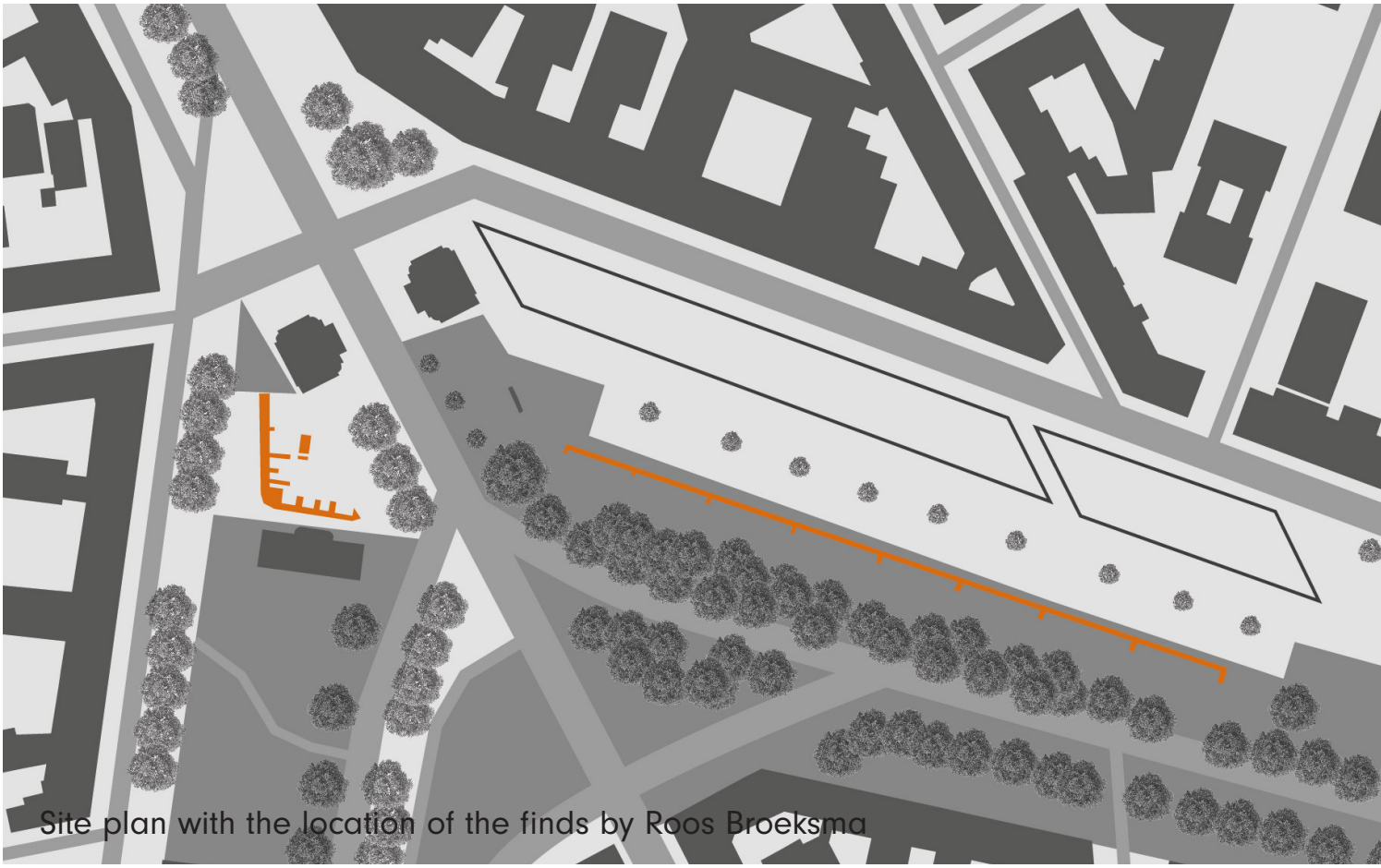
Masterplan of the design by Herzog & de Meuron
Herzog & de Meuron, z.d

ARCHAEOLOGICAL
And the influence on the design

The remains of the Spanish walls

While making the site built ready archaeological remains of the old Spanish city wall were found on the area where the smaller building was supposed to be built. This made it that the smaller building was never built nor will it ever be built.

Picture of the finds by (Arsuffi, 2019)



Site plan with the location of the finds by Roos Broeksma

Picture of the finds by (Arsuffi, 2019)

INFLUENCE OF...
Milanese Architecture

Twin Buildings
CityLife Milan By Bjarke Ingels Group, 2019

The original plan included the construction of a smaller second building across the road, next to the western bastion, but this has not yet been realized. This building was intended to restore the trace of the Spanish walls and to create towards the monumental cemetry two

"sightlines"

Milan's sightlines are key to its urban planning, highlighting important points and routes.

Additionally, the second building on the other side would be connected to the Milanese tradition of

"twin buildings"

In the 20th century, Milan frequently used twin buildings to emphasize street axes and add grandeur.

Cascina House, Italy
Archdaily, 2023

The design of the Feltrinelli Library is inspired by the simplicity and generous scale of historic Milanese architecture, such as Ospedale Maggiore, Rotonda della Besana, Lazaretto, and Castello Sforzesco. It is also influenced by the long, linear Cascina buildings from the traditional Lombardy

"rural architecture"

Cascina buildings from Lombardy are long, linear farmhouses with simple designs and large courtyards.

Gallaratese, Milano, Italy
Archdaily, 2020

This rural architecture was an important reference in Aldo Rossi's work, such as his residential building in

"Gallaratese"

It's geometric forms and strong urban presence, reflecting Rossi's focus on monumental architecture.

Another lesson from the architect Aldi Rossi reflected in the design is the monumental sense of

"permanence"

This is evident in the precise coherence between structure, facade, and layout.

The building consists of 66 prefabricated concrete portals, spaced 282 centimeters apart, rising to form a steep gabled roof with sharp points. These portals are clad with glass screens that diffuse light and reflect the surrounding buildings.

Also during their student years Herzog & de Meuron learned from Aldo Rossi during about the concept

"urban factst"

His ideas on the importance of enduring urban elements in shaping city identity are reflected in their work.

INFLUENCE OF...
Aldo Rossi

BUILDING ANALYSES

Sharp passage, between the two buildings
Herzog & de Meuron, z.d

Notably, the portals are not perpendicular to the axis of Viale Pasubio but are rotated at an angle of 47.8 degrees. At the roof, the portals rotate, causing the rectangular glass panels to change into diamonds. This imparts a dynamic character to the massive structure and alters the building's perception depending on the viewing angle. The protruding consoles enhance this perspectival effect, causing the concrete frame to display a continuously shifting geometric pattern.

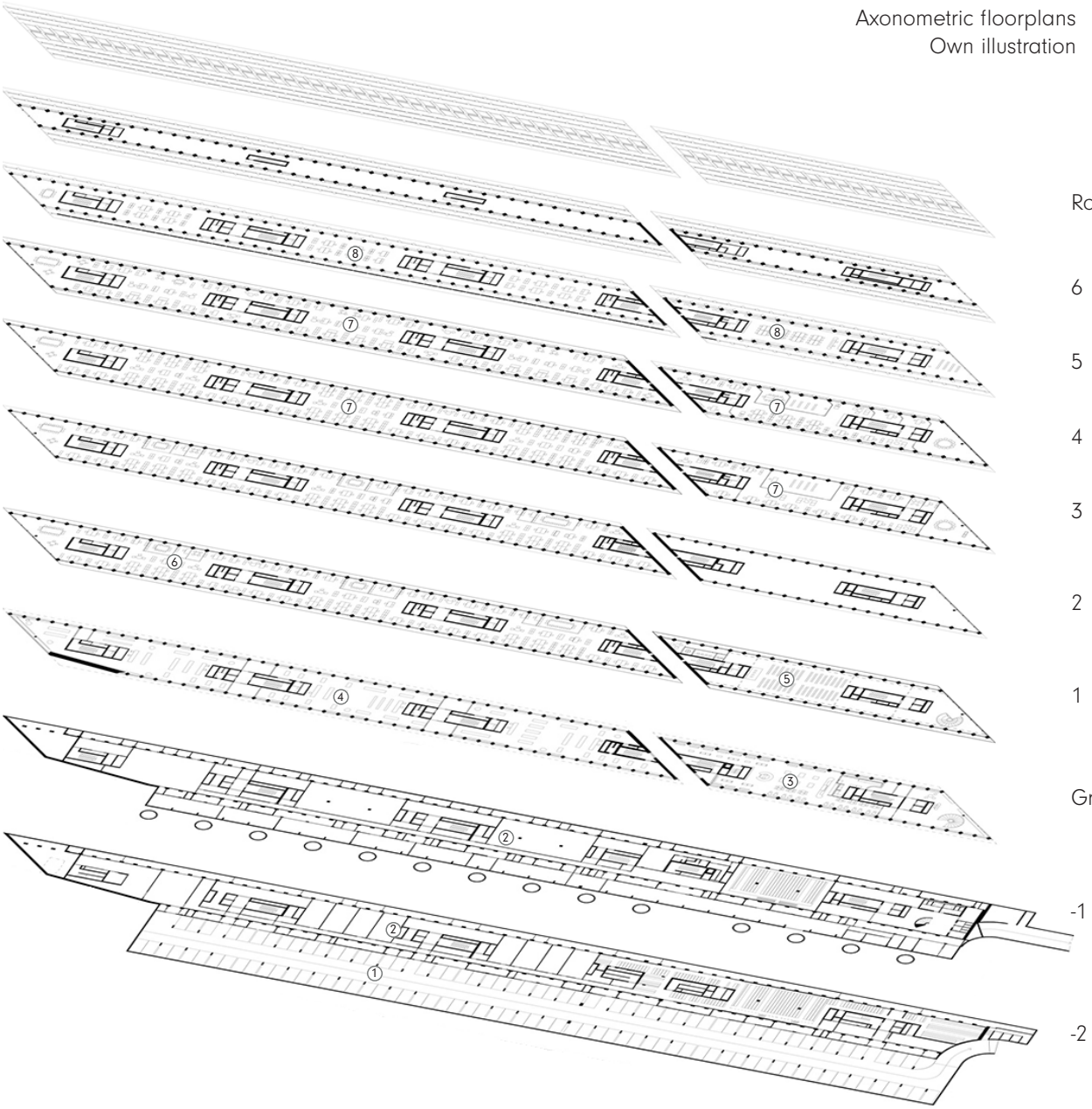
The Fondazione Feltrinelli occupies the section of the building defined by the first twenty-one portals. Here, a sharp passage forms a narrow connection between the boulevard and the park behind it, separating the building into two parts. The basement protects the Foundation's archives, while the ground floor hosts the entrance, bookstore, and cafeteria. A graceful, carefully designed staircase, a hallmark of the projects of Herzog & de Meuron, leads to the double-height multi functional space on the first floor and the offices on the upper levels. At the top, beneath the sharp roof points, is the reading room, offering a stunning view of the city.

> *"The ornament of the building stems from the consistency between structure, space, and materiality."*
>
> *~ Herzog & de Meuron*

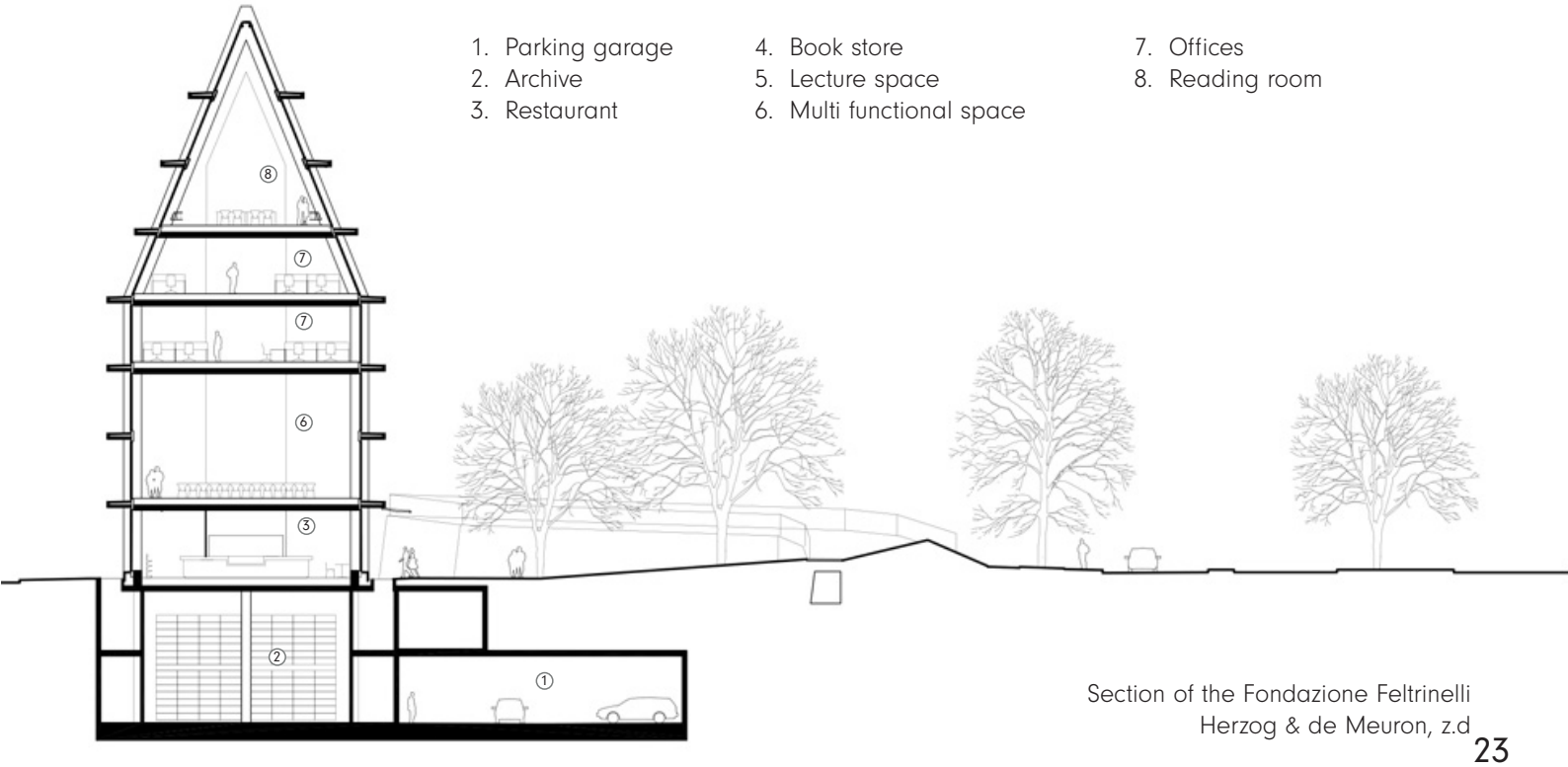
Reading room on the top floor
Herzog & de Meuron, z.d

While the serial and obsessive repetition of the reinforced concrete portals reveals Herzog & de Meuron's tribute to the vertical walls of the Gallaratese building by Aldo Rossi, it is important to highlight a fundamental difference. The walls in Gallaratese alternate between structural and decorative, whereas the portals of the Fondazione Feltrinelli are all strictly load-bearing. This is an essential detail because, according to the architects, 'the ornament of the building stems from the consistency between structure, space, and materiality.

Axonometric floorplans
Own illustration



1. Parking garage
2. Archive
3. Restaurant
4. Book store
5. Lecture space
6. Multi functional space
7. Offices
8. Reading room



Section of the Fondazione Feltrinelli
Herzog & de Meuron, z.d

BUILDING FACTS

The layout of the building

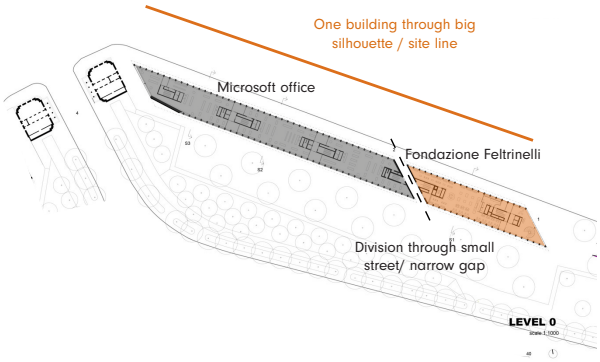
The building is divided into two parts: the Microsoft office is the left one and the Fondazione Feltrinelli is the second one. The buildings are separated by a narrow gap.

Microsoft Office:

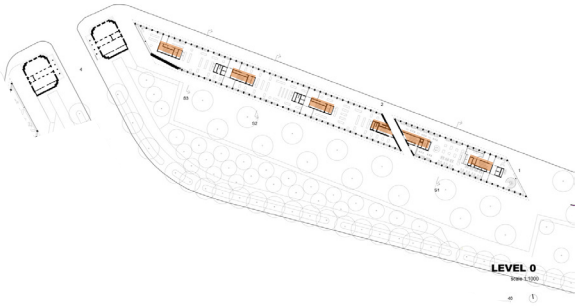
- Ground floor: showroom
- First floor: Microsoft technology center
- Second, third and fourth floor: Open plan work stations
- Fifth floor: private space for event hosting

Fondazione Feltrinelli:

- -2 & -1 floor: Archive (open for public festivals and for pre-booked guided tours).
- Ground floor: 400 sqm Bookstore featuring Feltrinelli books.
- First floor: Multi functional Hall for conferences, screenings and performances.
- Third floor: Offices.
- Fourth floor: Rooms for meetings and seminars.
- Top floor: Reading room with multimedia sections.



The layout of the building in the floor plan



Location of the staircases

‘ The library holds 250.000 books, a library of 17.500 newspapers and periodicals and 700 meters of shelves containing documents from the archives and 15.000 posters. ’

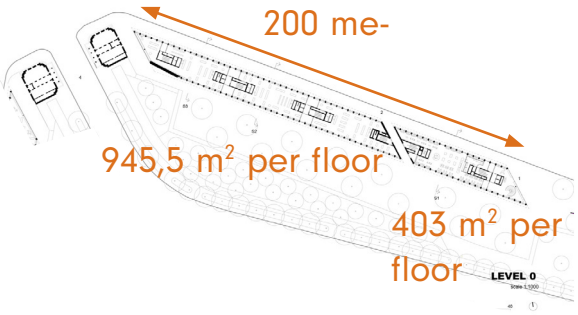
Use able floor area

Microsoft office building: 7.564 m^2
8 use able floors 7.564/8 = 945,5 m^2 per floor
Feltrinelli building: 2.418 m^2
6 usable floors 2.418/6 = 403 m^2 per floor

Total: 9.982 m^2

Facade Surface Area
Microsoft office building: 9.670 m^2
Feltrinelli building: 4.170 m^2

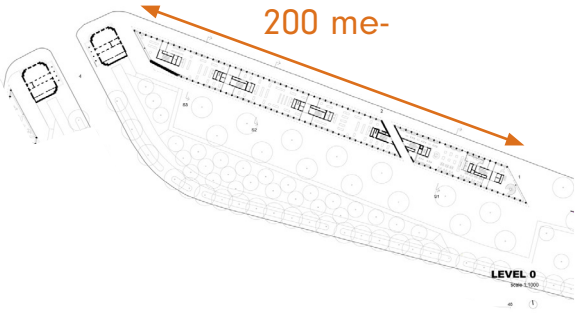
Total: 13.840 m^2



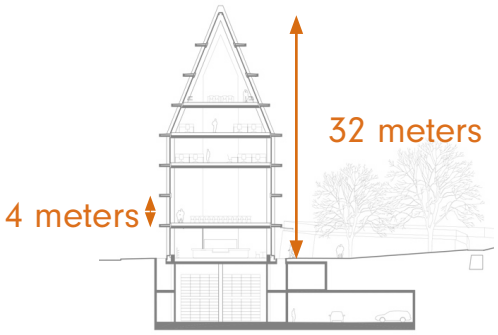
Use able area per floor in the floor

The measurements

The complex is 200 meters long and 32 meters high. 32 meters is 8 stories, so that means one story is 32/8 = 4m high.



Dimensions of the building in the floor plan



Dimensions of the building in the section

' The building includes the following square meters per function: Shops 1.080 m^2 , Restaurants/bars 135 m^2, Multi-purpose areas 403 m^2, Private space for event hosting 945,5 m^2, Microsoft technology center 945,5 m^2, Office space 3.239,5 m^2, Meeting rooms 403 m^2, Reading room 403 m^2 and Archives 1348,5 m^2. '

Library TYPES

Public Library

Public libraries, funded by the government, offer free access to books, digital media, and community programs. They promote literacy, lifelong learning, and cultural enrichment for all ages and backgrounds, often hosting events and activities to foster community engagement.

Public Library Delft,
Sallysphotos, z.d

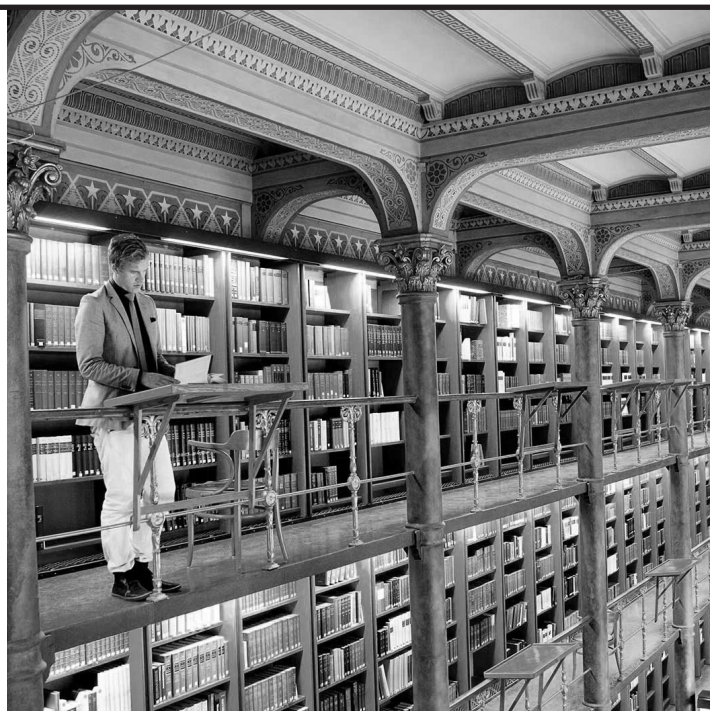
Technical University Delft,
Library, z.d.

Academic Library

Academic libraries, linked to educational institutions, support the research and study needs of students, faculty, and staff. They provide specialized collections, scholarly journals, and digital resources, along with study spaces and research assistance to enhance learning.

Special Library

Special libraries serve specific user groups or focus on specialized subjects, found in organizations like corporations, law firms, and museums. They offer tailored resources, rare collections, and expert research assistance to support specialized research and decision-making.



Special Library Software
Special Libraries - Axiell -, 2023

Braidense Biblioteca Nazionale Braidense, Milan
Biblioteca Nazionale Braidense, 2024

National Library

National libraries preserve and promote a country's heritage by housing a comprehensive collection of national works, including books, manuscripts, and digital resources. They archive history and culture, support research, and often collaborate with other libraries for global information access.

LIBRARIES IN MILAN

Overview of the libraries in Milan
Own illustration

Milan has a few libraries around the city center, these libraries date back to different centuries and are part of the city's identity. The libraries in the center, the **Biblioteca S. Ambrogio,** the **Sforzesco Castle Art Library** and the **Biblioteca Ambrosiana** were public libraries but have now become a tourist hotspot within the city. The **City Central Library of Milan** and the **Biblioteca Nazionale Braidense** are still widely used for visitors and used as a study and work place. The **Biblioteca Pime** and the **Biblioteca Sicila** are public libraries that are located a bit further from the center and are mainly used for children. Several events are hosted here for the education of children. The modern **Library Parco Sempione** is located in the green and with its glass facade is already in contrast to the other libraries. Finally, the **Fondazione Feltrinelli Library** stands out. Not only is this library located in a modern, emerging neighborhood, but its contemporary architecture also makes it a landmark in the city.

BIBLIOTECA S. AMBROGIO
11th century
Monument - Tourist spot

SFORZESCO CASTLE ART LIBRARY
15th century
Monument - Tourist spot

CITY CENTRAL LIBRARY
16th century
Monument - Tourist spot

BIBLIOTECA AMBROSIANA
17th century
Public library

BIBLIOTECA NAZIONALE BRAIDENSE
18th century
Public library

BIBLIOTECA PIME
19th century
Public library (children)

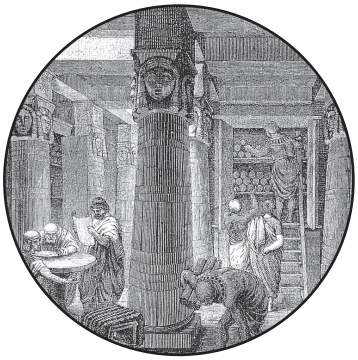
BIBLIOTECA SICILA (INDUSTRIAL)
19th century
Public library

LIBRARY PARCO SEMPIONE
20th century
Public library

FONDAZIONE FELTRINELLI
21th century
Public library

The evolution of libraries

from 600 BCE



600 BCE
First library

Ancient civilizations around the world built their own knowledge bases

Mid - 1800s
Public libraries gain popularity

Only members had access to libraries, but by the mid-19th cnetury new libraries were opened to share the sources of knowledge more widly

1890
Children set foot in libraries

Libraries started out as just for intellectual adults, but reading and childhood education is becoming incresingly important

1990
Digital library

Scientific articles and text-based databases came online, heralding the explosion of digital content

The evolution of libraries

to the 21th century

Late 1990s

Modern public libraries

Libraries are not just used for quiet reading, the functional space transformed into a light and airy, open meeting place for the community

2000

Digital newstands

Digital newsstands offer virtual contact that libraries can also use, allowing even more information to be offered

Late 2000

Catalogues go beyond books

From movies to music, libraries have long offered much more than physical books

2010s – now

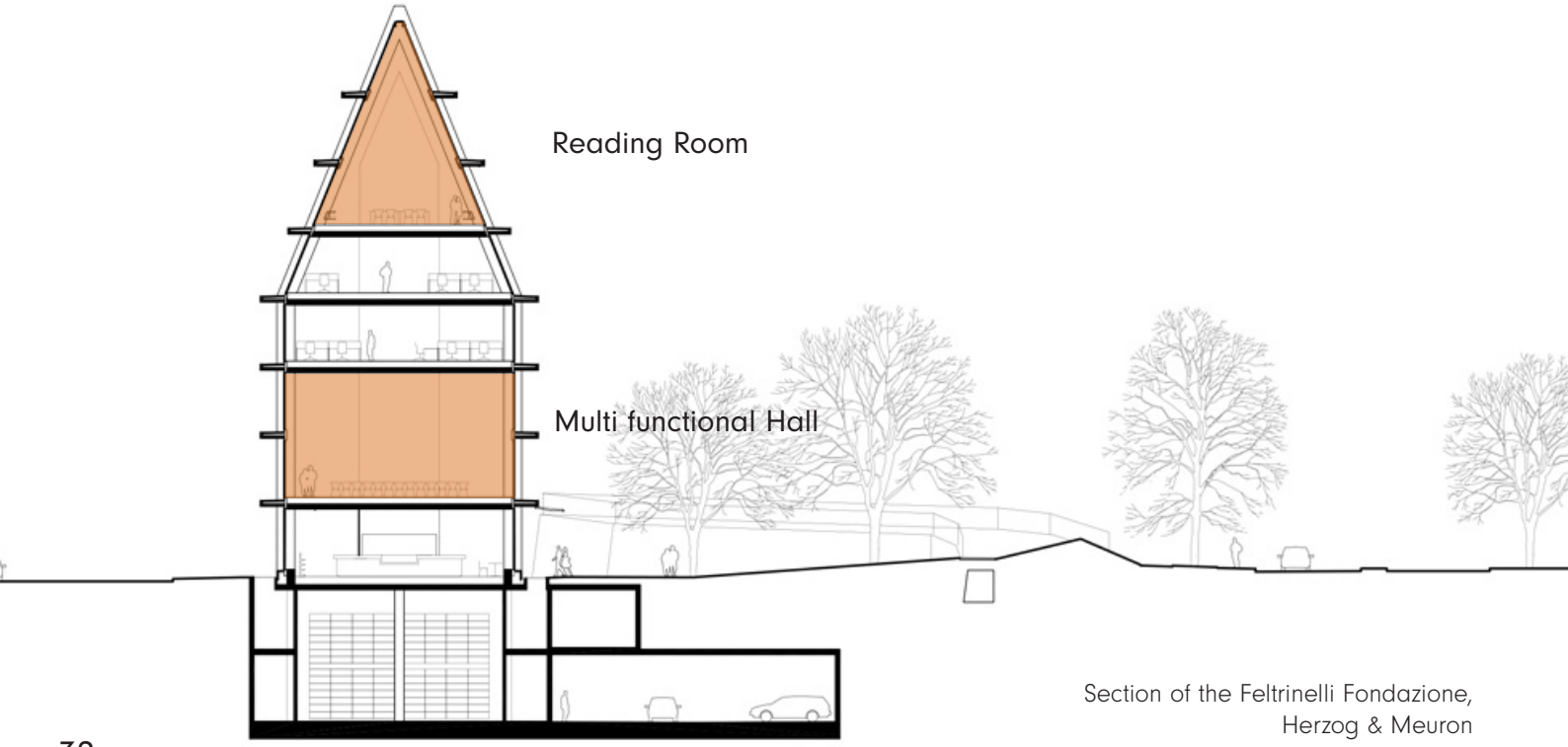
Creator spaces

Libraries are no longer just a place for reading and learning, but a place for creation. The library is a vibrant creative hub with multiple functions

CREATOR SPACE

in the Feltrinelli Fondazione library

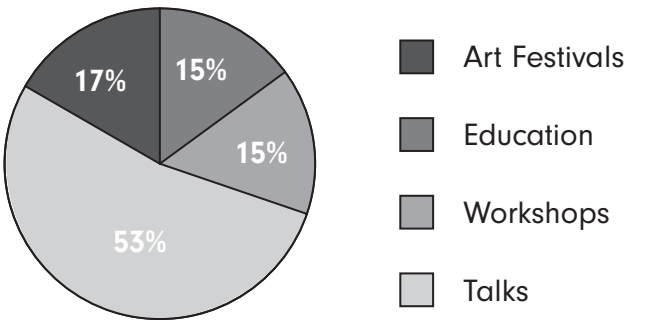
Libraries are no longer just a place for reading and learning, but a place for creation. The Feltrinelli Fondazione library also tries to make space for people who want to make, create and learn from each other. The library includes two spaces that serve as creator space, namely the multifunctional hall and the reading room, which can also be used for multiple events.



Section of the Feltrinelli Fondazione, Herzog & Meuron

Interior of the Fondazione Feltrinelli, Herzog & Meuron, Herzog & Meuron, z.d.

The research center serves as a platform for the facilitation of inclusion and discourse among academics, local actors, and communities. The addressed subjects include globalisation, sustainability, politics, rights, work, and urban concerns. The multi functional hall hosts various activities such as **art festivals, exhibitions, reviews, educational activities, workshops, screenings and performances.**



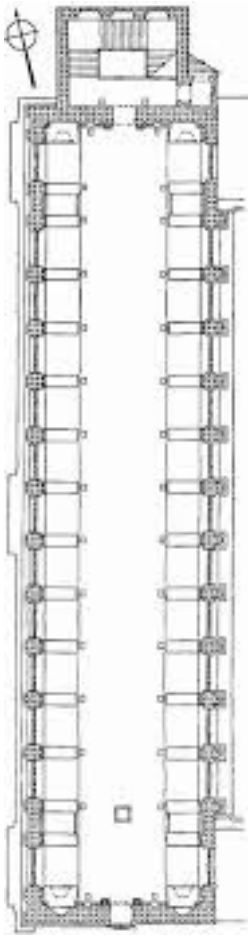
An analysis of the program and the possibilities for young and old give the following results, see the diagram on the right. It appears that the majority of the events are given in the form of 'talks', this will be in the form of screenings, reviews, performance, etc. On the other hand, there are hardly any exhibitions in the program. One reason for this may be that the space that is made available for this, the hallway, is too small, as can be seen in the photo above. If we look at the annual events in Milan, this could be an interesting contribution to the library. It also emerges that many of these talks and educational activities are given to children. However, the library does not seem to be really accessible to children.

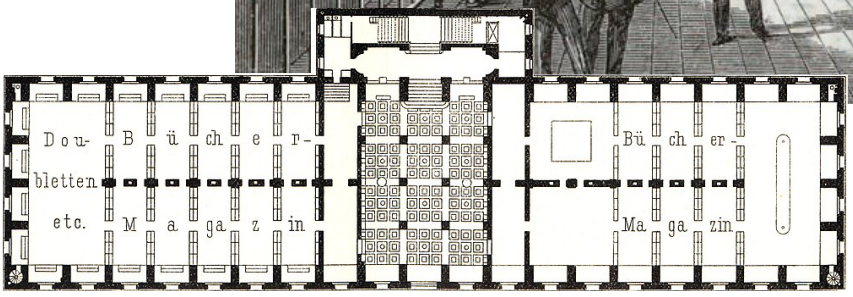
Libraries from the last CENTURIES

The first libraries were entirely focused on shared knowledge, which was provided in the form of books. These books were found in **bookcases** that were located in a long room. The room almost looks **like a hallway**, where you walk through, get a book and walk away again. The room was not a place to stay, but purely a **storage place for the books**. The books were also easily accessible from the ground floor. The libraries of that time were **enclosed by high solid walls**, Above the level of the bookcases there were windows through which the light entered the room. This created **no direct sight lines** from the room to the outside. The rooms were **not too bright** so that the books could not be damaged.

17th century

Wren Library Trinity College Cambridge



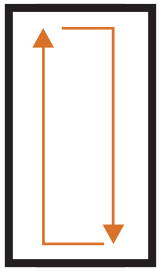


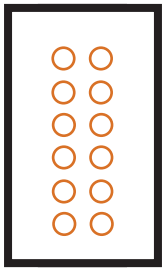
19th century

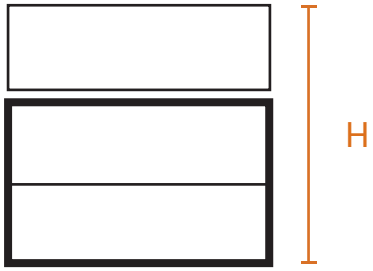
Sainte Genevieve Library, Paris

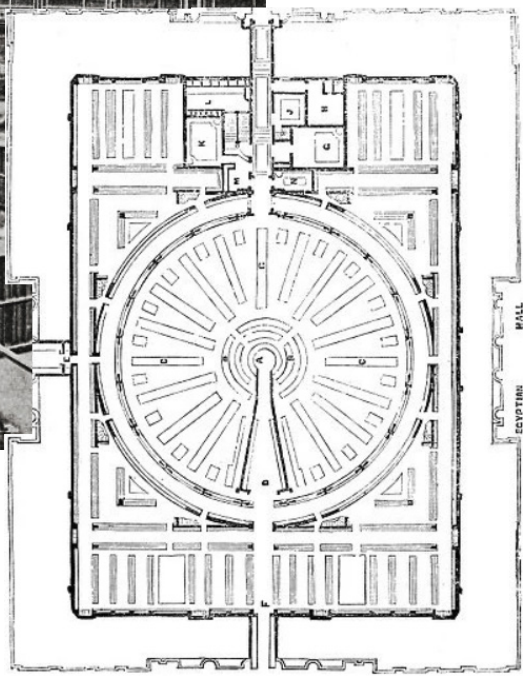
*The library is **no longer** just a place to gather books, but now there is also place for visitors*

In the nineteenth century we see that the interior of the library, but also its function, has changed. The library is no longer just a place to gather books, but now there is also **place for visitors**. The space is now a living space where people can read books. Also noticeable is that more books can be placed by adding an **extra level to the side**. As with the Sainte Genevieve Library in Paris, a void has been used, creating a narrow aisle to reach the books on the floor above. The windows are also only located above the bookcases, through which the light falls. The rest of the facades are closed. By using steel in the construction, it is also possible to make a **higher space and create a wider span**.



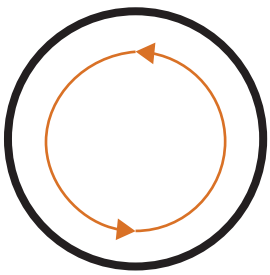


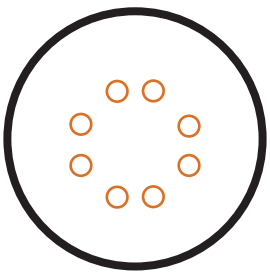


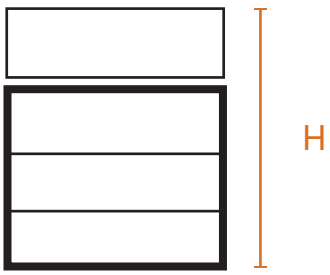


19th century

British Library, London

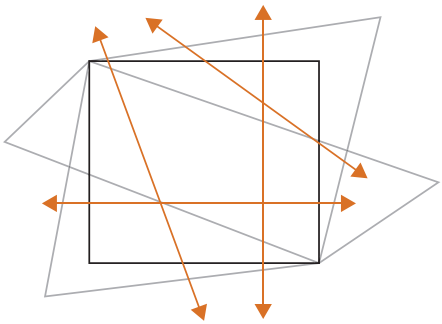


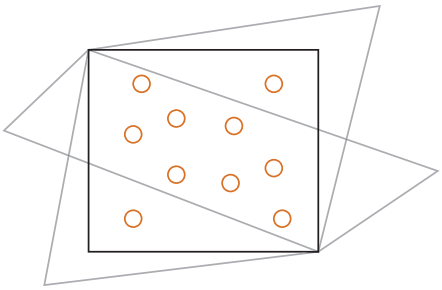


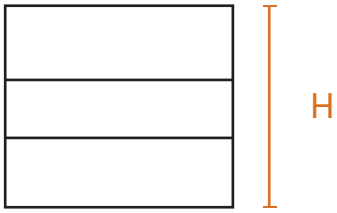


Other library designs also emerged, as can be seen at the British Library in London. A **round-shaped space**, where the bookcases are positioned along the facades, but also in the middle of the space. In this library also **multiple levels** have been added to the facades, so that more books can be displayed. In order to easily reach the books, 'voids' have also been added here, which can be reached by stairs. Despite the fact that there is s room for the visitor to read a book, the focus is very much on the books. The gigantic space is provided with large facades, through which the light falls in, but here too there are **no direct sight lines to the outside**.

Since the 20th century, major changes have been noticeable in the design and layout of the library. Thanks to **digitalisation**, many sources are now accessible to the public online. People no longer only come to the library for the books, but also to **engage, learn and meet each other**. That is why we see that the books are less present and **more space is made for visitors**. A more flexible layout is created and various places where people can read, learn and meet. The closed walls with the bookcases have been **substituted with glass facades**,, creating a pleasant and comfortable environment with **sight lines** from the interior to the exterior. Having an appealing view is advantageous, since it also attracts guests when the activities inside are visible from the outside.



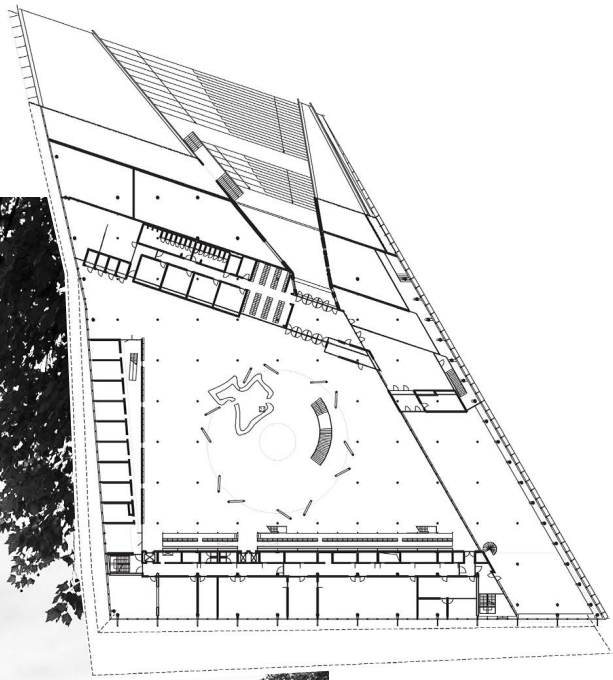


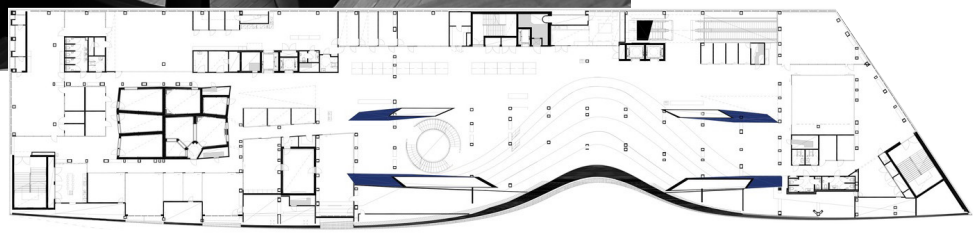


*A more **flexible layout** is created and various places where people can read, learn and meet*

20th century

University Library, Delft

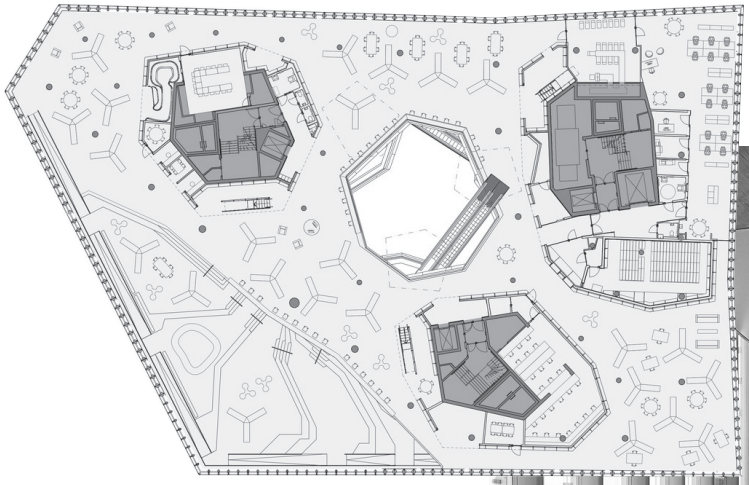




2018
Helsingfors, Finland

21th century

Libraries in the 21st century serve not just as venues for reading, studying, and socializing, but also as spaces for creation and education for re-entering the job market. Aesthetic and pleasant environment conducive to **social engagement and diverse activities, emphasizing experiential value**. An flexible floor layout featuring distinct areas designated for various functions. A **open façade** that permits ample light to enter the building, illuminating the expansive interiors and providing an **external view**.



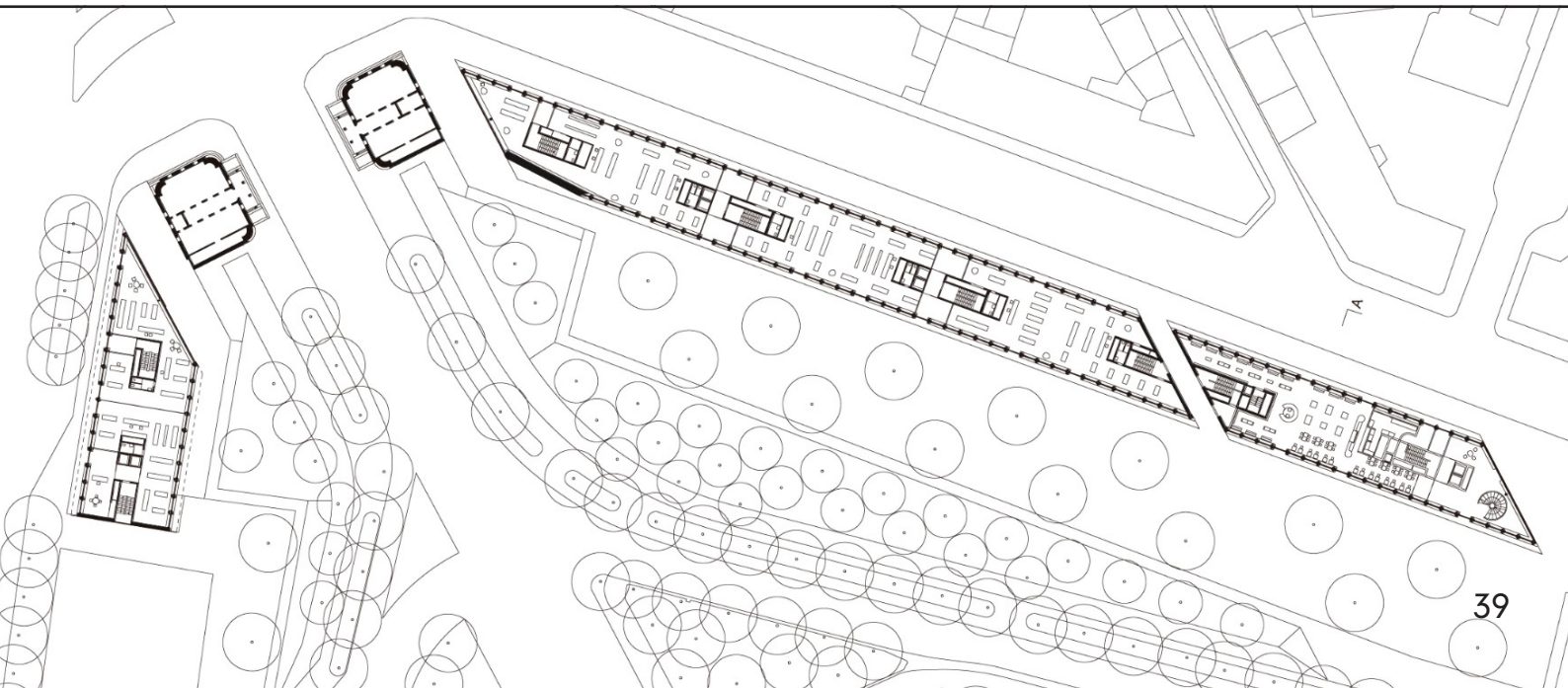
2020
Sentrum, Norway

2016
Milan, Italy

Reading Room of Fondazione Feltrinelli
Herzog & Meuron, z.d.

Fondazione Feltrinelli

The Fondazione Feltrinelli library serves as a **venue for events** and informs the residents of Milan with various current affairs. The events occur at the base of the building, while ascending, reveals quieter areas, exemplified by the reading room located at the top. The books increasingly disappear from sight, facilitating an open **layout for exhibitions, workshops, etc**.he glass facade offers an unobstructed view of the outside, while the interior activities remain distinctly observable to outside viewers.



LIBRARY COMPARISON

To get an idea of how other libraries function and are designed a research was done where Fondazione Feltrinelli was compared with two other libraries: the Forum in Groningen and the Jacob-and-Wilhelm-Grimm-Centre in Berlin. These libraries were chosen, because they both relate in some way to the Fondazione Feltrinelli. The Forum is also a multi-functional building and the Jacob-and-Wilhelm-Grimm-Centre is a building with the most focus on the library function and the studying.

The functions of the buildings are compared as well as the entries and the circulation to get a better idea on how such buildings function and are designed for their purposes.

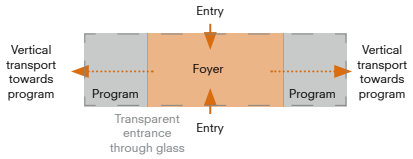
FUNCTION

Forum

Groningen

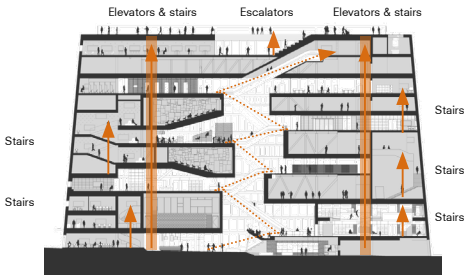
The Forum aims to be the living room of Groningen and includes:
Café's, shops, study spaces, library, exhibition spaces, movie halls, assembly rooms, restaurants, meeting areas

ENTRY



Multiple entries into big foyer with Adjoining program on both sides and open- and closed vertical transport to functions

CIRCULATION

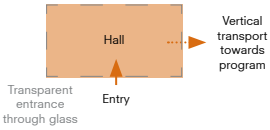


Escalators between public programs: main routing
Stairs between (private) connections in these programs: second routing
Elevators in the solid cores with flight stairs: necessary added routing

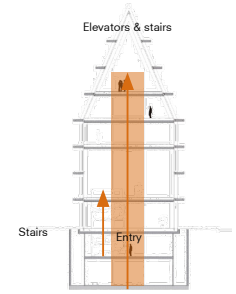
Fondazione Feltrinelli

Milan

Fondazione Feltrinelli is a research center and archive center and includes:
Café/restaurant, shops, multi-functional space (conferences, classes, exhibitions ed), offices, reading room and archives, study spaces



Single entry into hall with open- and closed vertical transport to functions

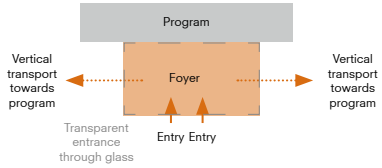


Open staircases: main routing on the lower floors
Elevators in the solid cores with flight stairs: necessary added routing and main routing on the higher floors

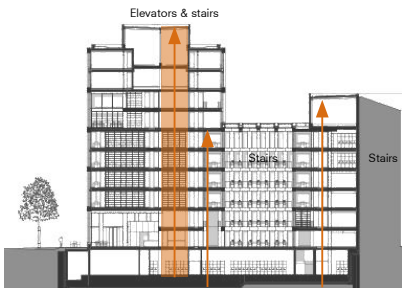
Jacob-and-Wilhelm-Grimm-Centre

Berlin

Jacob-and-Wilhelm-Grimm-Centre is an open to public university library and includes:
Library, university computer center, study spaces, library administration, classrooms and meeting areas



Multiple entries into big foyer with Adjoining program on one side and open- and closed vertical transport to functions



Open staircases: main routing on the lower floors
Closed stairs in solid cores: second routing for fast transport and necessary added routing
Elevators in the solid cores with flight stairs: necessary added routing and main routing on the smaller floors

Conclusions

Depending on the focus of the building the program changes, when wanting to be a living room more functions are included, whereas only being a library less functions are included. In the research center there are more programmatic functions then a library and less then for a living room.
The amount of programs depend on the image and main function the building has.

In the buildings with a bigger square meter floor plan: there is a big foyer with adjoining program and vertical transport to higher floors and in smaller buildings there is a smaller hall with transport to the upper floors.
All buildings have a transparent entrance through glass.

In all buildings open stairs or escalators are used to create an inviting connection
Solid cores are used for elevators and flight stairs and in a smaller spaces for the main transport.

FUTURE LIBRARIES

6 CHANGES
of the physical design

In the future, there will be a transition towards acquiring information through digital and online format. The priority in physical design will be on enriching the user experience rather than accommodating book storage.

Large quantities of magazines, newspapers, and journals occupied substantial areas of space, all this space can be filled differently in the future. Our study demonstrates six modifications in the physical design by utilizing pre-existing libraries.

01 Space for concentration & Conversation

Nowadays, the library also lends itself to workplaces, there are several quiet areas where people can concentrate well. However, it also appears that there is a need for space for joint discussion and social reflection, which also helps with productivity. It has also been shown that people can work better with some background noise. The design of the future library will therefore have to take into account various spaces that can accommodate customers and users with different working styles. The Viby Library & Culture House functions as a living room for the city of Viby in Denmark, this is achieved by creating social zones, applying open architecture and realizing accessibility.

Viby Library & Culture House, Denmark
Christensen & CO, 2021

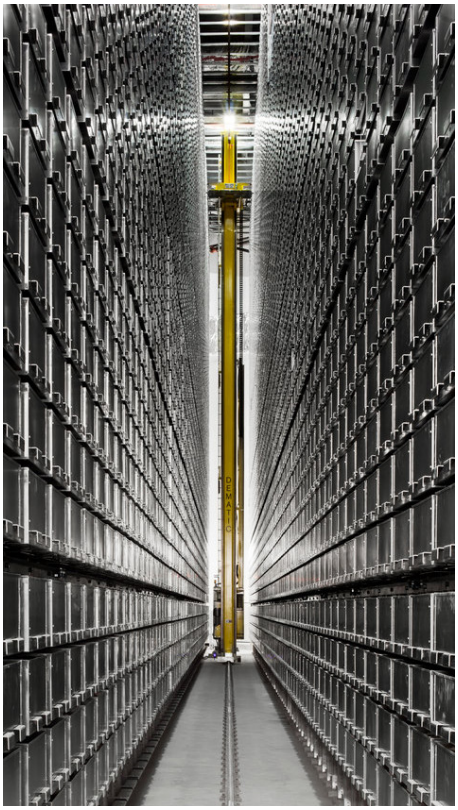
02 Technology & tools play an important role

To remain ahead of the present developments, the library will also prioritize the use of new technologies and tools. Recent additions to libraries include exhibition rooms, workshop halls, and other similar facilities. In addition, further technological equipment is being acquired, including 3D printers and audio booths. The Idea Exchange library in Canada, sometimes referred to as the bookless library, provides the local population with complimentary access to maker spaces, which facilitate learning and foster creativity. An emerging, centralized hub for gathering and socializing.

03 Furniture & facilities for modern work Environments

Post-pandemic, remote work has become increasingly common, with individuals contentedly utilizing a variety of workplaces such as the library. In order to fully accommodate a modern workplace, new types of facilities are also required, as well as furniture that is ergonomic and comfortable. A sufficient number of power outlets, ideally an additional screen, adjustable seats and sit/stand desks, and complimentary wifi will be required.

Community Center, Extension, Cambridge, Canade
Archdaily, 2018



Mansueto Library of the University of Chicago
Archdaily, 2011

04 Smarter storage of the analogue collection

The new times are causing a shift from the analogue collection to the digital formats. However, libraries are also seen as protectors of the local intellectual heritage and some people would still like to access the old collections. In order to address this issue, further inventive storage methods will be developed, exemplified by the autonomous book retrieval system implemented in the Mansueto Library of the University of Chicago. 3.5 million books are stored in an Automated Storage and Retrieval System (ASRS) within an underground 'box', enabling the ground level areas to be designated for individuals.

05 Implement sustainable architectural practices

Libraries, as integral components of the social infrastructure, hold a prominent position within their communities and should thereby serve as models and promote sustainability. Numerous libraries have already implemented sustainable practices to actively contribute to the long-term viability of their community. The Charles Library at the University of Philadelphia's green roof spans an impressive 47,300 square meters, making a significant contribution to the regional storm water management system.

Green roof, Charles Library, University of Philadelphia
Archdaily, 2019

"Attractive or interesting enough to be suitable for photographing and posting on social media"

Tianjin Binhai Library
Archdaily, 2017

06 Instagrammability: influence of socials

Visual content is captured on camera and shared on social media, so providing the library with a strategic benefit. If the image is attractive or interesting enough to be suitable for photographing and posting on social media, it can attract more visitors. The Tianjin Binhai Library in China features a a futuristic atrium with floor-to-ceiling bookcases and attracts 10,000 visitors per day.

PHYSICAL CHANGES

LIBRARY FELTRINELLI

01

Space for concentration & conversation

In the Fondazione Feltrinelli Library there is space for concentration and conversation. There is a reading room where one can retreat for concentration, but also space where one can meet each other, such as in the library store, the multi functional hall and a restaurant.

02

Technology & tools play an important role

The building appears to lack emphasis on technology and tools, based on my observations. Nonetheless, it extensively utilizes multiple online platforms to tell visitors about the numerous events occurring in the library.

03

Furniture & facilities for modern work environments

In the reading room, there are several seating options available. The workstations are furnished with electrical outlets and additional lighting. However, it appears neither comfy nor ergonomic.

04

Smarter storage of the analogue collection

The library has its archives below ground level. This generates considerable more space for various tasks that fulfill the requirements of visitors.

05

Implement sustainable architectural practices

The architects endeavor to incorporate a sustainable approach in their designs. Adjacent to the building, a verdant field has been established alongside the boulevard, where numerous trees have also been planted.

06

Instagrammability: influence of socials

The area is contemporary and stylish, offering a remarkable experience when entering the building and gazing over the city from the top levels. The extent to which the edifice can be deemed Instagrammable remains uncertain.

Public libraries foster ENVIRONMENTAL SUSTAINABILITY

Eco-friendly business model

Libraries have consistently demonstrated sustainability through their practice of lending and sharing resources. Rather of purchasing a book, several individuals can utilize the same copy. The books possess an extended lifespan due to superior care.

The library is currently augmenting this approach by renting other things, including musical instruments and new technologies, thereby reducing the likelihood of purchases and disposals.

> “renting other things, including musical instruments and new technologies”

Library of Things
Wellesley Free Library, 2021

Center for Sustainable Initiatives

An increasing number of books are being published, prompting libraries to decide whether to retain them; discarding unwanted books is not a viable solution. The Sustainable Shelves Program provides an alternative by collecting, grading, and classifying these books for resale or recycling. This approach minimizes waste for libraries and reduces expenses associated with external waste management services.

> “discarding unwanted books is not a viable solution”

Platform to educate and empower patrons

Public libraries, including a global network of 400,000, have access to extensive knowledge on environmental issues, which might be made more accessible to patrons.

To enhance public awareness of environmental issues, the following measures may be implemented. Activities on and surrounding Earth Day, advocating for environmental initiatives, facilitating opportunities for environmental activists, and organizing workshops.

Toronto Public Library
Archdaily, 2022

Janelle Richards, an environmental activist, provided her experience in conservation and sustainability to the Toronto Public Library through events, workshops, and community consultations.

The green initiates from the interior

Libraries are predominantly situated in physical locations and branches, necessitating eco-friendly measures in construction and restoration due to their substantial real estate presence.

The National Library of Singapore employs bioclimatic design approaches to regulate daytime temperatures and minimize energy waste, featuring 120 species of tropical plants throughout 14 distinct gardens that contribute to cooling the structure.

> “National Library of Singapore conserve up to 31% more energy than a conventional buildings”

Increasing significance of digital technology

Digitizing the library contributes enormously to reducing the ecological footprint of a library.

The Courtyard, National Library, Singapore.
Terence Ong, 2006

COLOPHON

Title
Building analysis of library Fondazione Feltrinelli

Publication date
3 October 2024

Redaction
Babette Duijvestein
Sam Haverhals
Roos Broeksma

Graphic design
Babette Duijvestein
Sam Haverhals
Roos Broeksma

Part of research for TU Delft, Faculty of architecture,
Graduation studio Complex Projects 2024-2025

Assembly
RASLOCHI

Appendix 2: Lens analysis

CULTURE

EVENTSEVENTSEVENTS
M I L A N
EVENTSEVENTSEVENTS

GROUP 2

complex CP projects

JANUARY

FASHION WEEK

Milan Fashion Week is one of the most prestigious and influential fashion events in the world, showcasing innovative designs and trends from both established and emerging designers. The event features a series of runway shows and presentations, attracting celebrities, industry insiders, and fashion enthusiasts. It's a celebration of Italian craftsmanship and international fashion creativity.

Mid January (men), late February (women), mid June (men) late Sept (women)

Brera, Historical Center, Quadrilatero della Moda, Porta Nuova Districts, Milan

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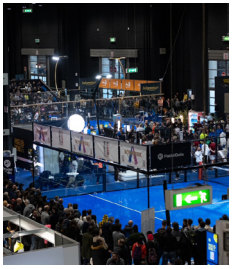
HOMI

HOMI is focused on interior design and upscale home décor, showcasing a variety of products including textiles, tableware, cookware, and fragrances. The fair aims to connect suppliers with key buyers and features workshops, seminars, and special projects to highlight the latest trends in the home and lifestyle sector.

Annual, mid January

Fiera Milano Rho, Milan

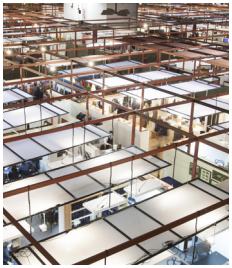


MILANO PADEL EXPO

The Padel Trend Expo is an immersive event dedicated to the sport of padel. It features a wide range of activities including entertainment, exhibitions, and educational conferences.

Annual, mid January.

MiCo FieraMilanoCity, Milan



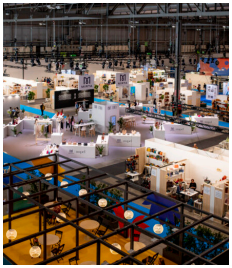
MI UNICA

Milano Unica is a prominent trade show dedicated to high-end textiles and accessories, showcasing the best of Italian craftsmanship. The upcoming edition emphasizes sustainability and innovation within the fashion industry, with a focus on artificial intelligence and future challenges in textiles.

Annual, late January

Milano Fiera Rho, Milan

FEBRUARY



MICAM & MIPEL

Are two international trade fairs held together, showcasing footwear (MICAM) and leather goods (MIPEL) from top global brands.

Twice a year, February and September.

Fiera Milano Rho, Milan

FILO

Is an international trade fair dedicated to high-quality yarns and fibers for the textile industry, focusing on innovation and sustainability.

Twice a year, February and September.

Milano Convention Centre, Milan

JUSTICE DAY

The event focuses on commemorating those who have exhibited courage and integrity in the fight for justice and human rights. It includes ceremonies to honor new inductees into the “Giardino dei Giusti” (Garden of the Righteous), recognizing their efforts against injustice and oppression.

Annual, mid March

Monte Sella Garden, Milan

FASHION WEEK

Milan Fashion Week is one of the most prestigious and influential fashion events in the world, showcasing innovative designs and trends from both established and emerging designers. The event features a series of runway shows and presentations, attracting celebrities, industry insiders, and fashion enthusiasts. It's a celebration of Italian craftsmanship and international fashion creativity.

Mid January (men), late February (women), mid June (men) late Sept (women)

Brera, Historical Center, Quadrilatero della Moda, Porta Nuova Districts, Milan

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EAHAD

(Annual Congress of the European Association for Haemophilia and Allied Disorders) This congress gathers healthcare professionals involved in the care of individuals with haemophilia and other bleeding disorders. It aims to improve clinical care, educate medical practitioners, and promote scientific research related to these conditions.

Annual, early February

Milano Convention Centre, Milan

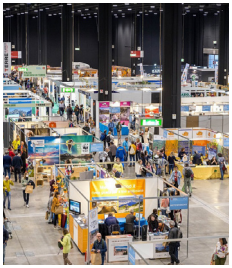
LIBRI IN DUOMO

This event features book presentations, author signings, and cultural discussions, turning the bookstore into a hub for literary activities. It highlights both established and emerging authors, offering readers opportunities to engage with writers and literary professionals.

Annual, throught the year.

Mondadori MegaStore, Milan

MARCH



FA' LA COSA GIUSTA!

Is Italy's largest fair focused on sustainable living and conscious consumption. The 2024 edition, themed "Rendere visibile l'essenziale," celebrates the 20th anniversary of the event with discussions on sustainability, education, and global peace. The event features exhibitions, cultural programs, workshops, and debates.

Annual, mid March

Allianz MiCo, Milan

GCCOR

The GCCOR (Global Congress on Cardiology) in Milan focuses on advancements in cardiology and cardiovascular medicine. It brings together professionals from various sectors, including clinicians, researchers, and industry experts, to share knowledge, discuss new research, and collaborate on advancements in cardiovascular health.

Annual, mid March

Hilton Garden Inn, Milan

STRA WOMEN

STRA Women is part of the larger Stramilano event, focusing on women's participation in running. The event includes a 10 km run and a shorter 5 km run, both designed to promote health, fitness, and community among women of all ages.

Annual, late March

Piazza Duomo, Piazza Castello, Milan

UNICATT OPEN DAYS

The Unicatt Open Days offer prospective students insights into various undergraduate, graduate, and postgraduate programs available at Università Cattolica del Sacro Cuore. Participants can attend information sessions, meet faculty, and tour the Milan campus.

Annual, early to mid March

Faculties at Università Cattolica, Milan

APRIL

POLIMI OPEN DAYS

Politecnico di Milano's Open Days provide an opportunity for prospective students to explore the university's academic offerings, including bachelor's and master's programs. Participants can attend presentations, meet professors, and learn about student life, admissions, and career services. The event targets students interested in architecture, design, and engineering.

Annual, early to mid April

Faculties at Politecnico di Milano, Milan

EAHAD

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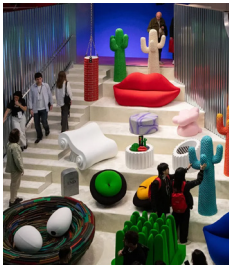
Annual, early February

Milano Convention Centre, Milan

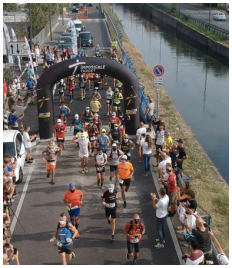


SALONE DEL MOBILE

The Salone del Mobile is an internationally renowned furniture and design fair that showcases the latest innovations in furniture, lighting, and interior design.

Annual, mid April

Milano Fiera Rho, Milan



ULTRA MILANO-SANREMO

The Ultra Milano Sanremo is a prestigious ultramarathon race that covers a distance of approximately 280 km. It follows a scenic route from Milan to San Remo, mimicking the famous cycling race Milan-San Remo. Participants can compete as individuals or in relay teams.

Annual, mid April

Milan center to Sanremo center

JUSTICE DAY

(Annual Congress of the European Association for Haemophilia and Allied Disorders) This congress gathers healthcare professionals involved in the care of individuals with haemophilia and other bleeding disorders. It aims to improve clinical care, educate medical practitioners, and promote scientific research related to these conditions.

Annual, early February

Milano Convention Centre, Milan

EUROLUCE

Is an important international lighting exhibition that showcases the latest innovations and technologies in lighting for both indoor and outdoor spaces.

Annual, mid April

Milano Fiera Rho, Milan

TOYS MILANO

Toys Milano is the premier B2B event in Italy focused on the toy industry, including toys, stationery, party, and decoration items. It serves as a platform for professionals in the toy and childcare sectors to network, share insights, and explore market trends. The event includes seminars, conferences, and award ceremonies, highlighting innovation and creativity in the industry.

Annual, mid May

Allianz MiCo, Milan

EAHAD

(Annual Congress of the European Association for Haemophilia and Allied Disorders) This congress gathers healthcare professionals involved in the care of individuals with haemophilia and other bleeding disorders. It aims to improve clinical care, educate medical practitioners, and promote scientific research related to these conditions.

Annual, early February

Milano Convention Centre, Milan

SALONE DEL COMPLEMENTO D'ARREDO

The Salone del Complemento d'Arredo is a premier international exhibition dedicated to furnishing accessories, part of the larger Salone del Mobile event. It showcases the latest trends and innovations in home decor, attracting designers, manufacturers, and industry professionals.

Annual, mid April

Fiera Milano Rho, Milan

STRA MILANO

This annual event includes three popular races: the 10 km, the Stramilanina 5 km, and the Half Marathon (21.097 km). The 10 km race, the most attended, will start from Piazza Duomo at 8:30 AM and 9:00 AM, while the Half Marathon begins at 10:00 AM from Piazza Castello, with the finish line at Arena Civica in Parco Sempione.

Annual, mid March

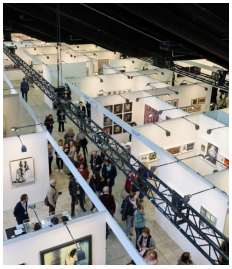
Piazza Duomo, Piazza Castello, Parco Sempione, Milan

SGUARDI ALTROVE FILM FESTIVAL

Is an international film festival that focuses on women's cinema. It aims to highlight issues relevant to women across different cultural, political, and social contexts through films directed by women.

Annual, mid March

Via Bassano del Grappa 32, Milan



MIA FAIR

Is an international photography art fair that has been held annually in Milan since 2011. It is Italy's premier art event focused on photography, offering a mix of solo and group exhibitions curated to showcase contemporary photography from both established and emerging artists.

Annual, mid April

Allianz MiCo, Milan

APE

Dynamic event during Milan Design Week that merges art, design, and music in a vibrant, creative atmosphere.

Annual during Design Week, April

BASE Milano, a creative hub

ICLPS

International Conference on Law and Political Science. This conference aims to present new advances and research results in the fields of law and political science, fostering communication among researchers and practitioners.

Annual, late April

Not disclosed yet, Milan

MAY

MUSIC WEEK

Milano Music Week is a vibrant celebration of music in Milan, featuring concerts, workshops, and events that showcase both emerging and established artists across various genres.

Twice a year, late May & late November

Various venues throughout Milan, including the Teatro degli Arcimboldi

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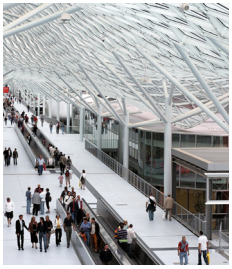
TUTTO FOOD

TUTTOFOOD is Italy's largest international food exhibition, focusing on the agri-food industry. It provides a platform for networking among stakeholders, showcasing innovative food products, and discussing industry trends and challenges. The event features exhibitions, educational sessions, and competitions aimed at professionals in the food sector.

Anunal, early May

Milano Fiera Rho, Milan



EHGC

This conference is organized by the European Society of Human Genetics and focuses on advancements and research in human genetics, attracting experts and professionals from around the world.

One-time, late May

Not disclosed yet, Milan

TORNEO CITY LIFE

Is a prestigious event held in Milan, featuring both men's and women's matches. It's an important stop for emerging tennis talents and attracts participants from various countries.

Twice a year, late May start of June

CityLife Shopping District, Milan

PIANO CITY

Piano City Milano is an annual diffuse piano festival, transforming Milan into a grand open-air stage. Concerts are held in homes, courtyards, parks, museums, and other unconventional locations, creating a unique experience of live music all across the city. The event includes not only concerts but also piano lessons and readings, all free for the public.

Annual, late May

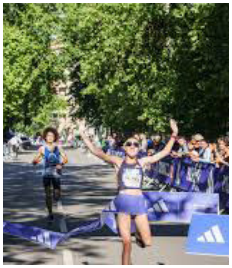
Variuous locations, Milan

5.30

Is a social fitness event aimed at promoting health and wellness by encouraging people to run or walk early in the morning. The event starts at 5:30 AM, hence the name, and participants typically run a 5 km route through the streets of their city.

Annual, late May

Piazza Duomo, Parco Sempione, Milan



POLIMIRUN

PolimiRun is an annual 10 km race organized by the Politecnico di Milano, open to both competitive and non-competitive runners. The event connects the university's two Milan campuses, encouraging participants to run for fitness, personal challenge, or simply for fun.

Annual, end of May

Campus Bovisa & Campus Leonardo, Milanconcerts

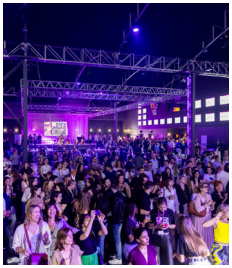
JUNE

UNIMI OPEN DAYS

The Unimi Open Day is an event dedicated to prospective students, featuring presentations of undergraduate programs (Bachelor's and single-cycle Master's degrees) offered by the University of Milan. Attendees can gather information about academic offerings, student services, and participate in workshops and mock lectures.

Annual, early to mid June

Faculties at UNIMI, Milan



LEGAL COMMUNITY WEEK

Legal Community Week is a premier global event aimed at professionals in the legal, tax, and finance sectors. It brings together a diverse group of lawyers, general counsel, and financial professionals for a series of conferences, discussions, and networking events.

Anunal, mid June

Hotel Principe di Savoia, Milan

ISDH

The International Symposium on Dental Hygiene (ISDH) brings together dental hygiene professionals to discuss current research, practices, and innovations in the field. It aims to enhance knowledge and promote effective dental hygiene practices globally.

Biennal, early June

Not disclosed yet, Milan

MILANO SUMMER FESTIVAL

Annual outdoor music event featuring performances by international artists across various genres.

Jun, July, August

Ippodromo Snai San Siro

ITMA MILANO

Is the world's leading textile and garment technology exhibition, showcasing the latest innovations in the industry.

Every four years, June

Fiera Milano Rho

PALIO DELL'ORTICA

Is a traditional neighborhood festival in Milan that celebrates local culture with parades, games, and music.

Annual, one weekend in June

Ortica District

ARIANTEO

Is an open-air cinema festival in Milan, featuring screenings of classic and contemporary films in iconic city locations.

Annual, from June to September

Various venues across Milan, including Chiostro dell'Incoronata

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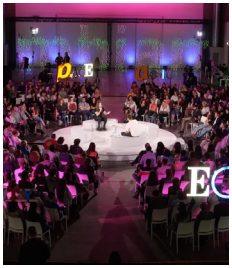


WIREDNEXT FESTIVAL

The WiredNext Festival is a premier event focused on the intersection of technology, culture, and innovation, featuring discussions, workshops, and exhibitions from experts across various fields, including artificial intelligence and digital ethicssustainability, training, and safety in the events industry.

Annual, end of june

Castello Sforzesco, Milan

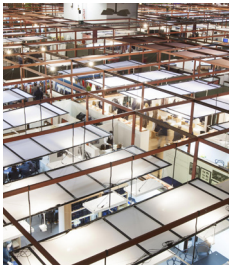
FASHION WEEK

Milan Fashion Week is one of the most prestigious and influential fashion events in the world, showcasing innovative designs and trends from both established and emerging designers. The event features a series of runway shows and presentations, attracting celebrities, industry insiders, and fashion enthusiasts. It's a celebration of Italian craftsmanship and international fashion creativity.

Mid January (men), late February (women), mid June (men) late Sept (women)

Brera, Historical Center, Quadrilatero della Moda, Porta Nuova Districts, Milan

JULY

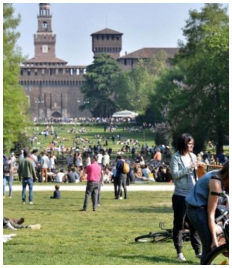


MILANO UNICA

Is a prestigious international trade fair showcasing high-end textiles and accessories for fashion professionals.

Twice a year, February & July

Fiera Milano Rho



APE AL PARCO

Is an outdoor event that combines music, food, and socializing in a relaxed park setting.

Sundays during the summer months, from June to September.

Parco Sempione

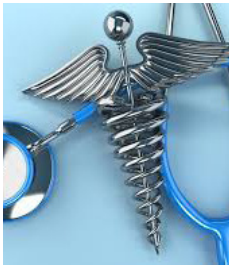
AUGUST

CARDIO MEET

The International Meet on Cardiology (CARDIOMEET) serves as a premier interdisciplinary platform for professionals in the field of cardiology, including researchers, healthcare practitioners, and industry leaders. The event focuses on the latest innovations, trends, and collaborative solutions in cardiology, fostering discussions and knowledge exchange among attendees.

Biennal, late August

Not disclosed yet, Milan



PHARMAMEET

Is a significant interdisciplinary conference that aims to bring together professionals from various fields including pharmacy, healthcare, and research. It will cover the latest innovations and trends in pharmacy and pharmaceutical research, fostering collaboration and discussions among experts.

One-time event, late August

Not disclosed yet, Milan

ICEMIC

This conference will address various critical topics in emergency medicine and intensive care, including pre-hospital care, critical care nursing, pharmacology, sepsis management, and more. It aims to gather healthcare professionals to discuss innovations and advancements in the field.

One-time event, mid August

Hilton Garden Inn, Milan

SEPTEMBER

BOCCONI OPEN DAYS

The Bocconi University Open Days offer prospective Master of Science students a chance to explore various programs, admissions processes, and campus facilities. Participants can engage with faculty, current students, and alumni to gain insights into academic offerings and student life.

Annual, end of September

University Bocconi, Milan

FASHION WEEK

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Brera, Historical Center, Quadrilatero della Moda, Porta Nuova Districts, Milan

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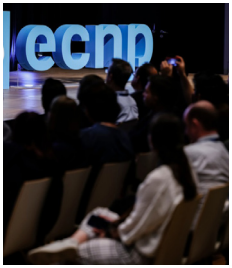
WCPA

The 17th World Congress on Polyphenols Applications aims to bridge scientific research on polyphenols with their health benefits. The event will cover various topics including the impact of polyphenols on health, interactions with gut microbiota, and applications in food and agriculture. It will feature discussions on translating research findings into practical health benefits.

Biennal, late September

Università Statale, Milan



ECNP CONGRESS

he ECNP Congress is Europe's premier scientific meeting for neuropsychopharmacology, focusing on advancements in brain research and treatment, and attracting thousands of professionals from various fields.

Anual, late September

Allianz MiCo, Milan

ICBEB

The ICBEB 2024 is an international conference focused on promoting research and development in Biomedical Engineering and Bioinformatics. It aims to facilitate communication among experts and scholars in these fields.

Annual, mid September

Not disclosed yet, Milan

FESTA DELLA DANZA

By Roberto Bolle is a celebration of dance, featuring performances by Roberto Bolle and other renowned dancers from various genres.

Annual, July

Teatro alla Scala or other iconic venues in Milan

FESTIVAL DEL SILENZIO

Is an inclusive performing arts event focusing on non-verbal communication, with performances in sign language, visual arts, and body expression.

September 17

Fabbrica del Vapore

BEACTIVE LOVES YOUR RUN

Is a community running event promoting fitness and well-being through organized runs in scenic city areas.

Anual, September

Parco Sempione and other iconic locations in Milan

WANDERLUST

Wellness event combining yoga, meditation, and running, often accompanied by music and mindfulness workshops.

Annual, September

CityLife Park

LOMBARDIA BEER FEST

Craft beer festival featuring a wide variety of local and international brews, along with food trucks and live music.

Annual, September

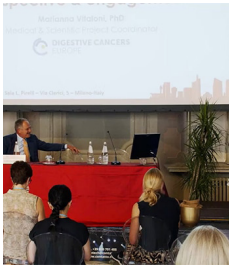
Allianz MiCo, Milan

FILO

Is an international trade fair dedicated to high-quality yarns and fibers for the textile industry, focusing on innovation and sustainability.

Twice a year, February and September

Milano Convention Centre, Milan



CICON

Cancer Conference is an event focused on advancements in cancer research, treatment, and care.

Annual, October

MiCo - Milano Convention Center, Milan

BEAUTY WEEK

Milano Beauty Week is a cultural initiative celebrating the beauty and cosmetics industry, focusing on its social, scientific, and economic impact through workshops, events, and sensory experiences.

Annual, September

Brera District and historic Center, Milan

PING PONG STATION

Is an engaging pop-up event dedicated to table tennis enthusiasts, featuring tables for public use, tournaments, and workshops for players of all skill levels.

Annual, Mid Septemer until end of October

Milan's Mercato Centrale, Milan

GO INTERNATIONAL

Go International is the primary Italian exhibition dedicated to export services, aimed at connecting businesses seeking support for internationalization with service providers.

Annual, end of Septemer

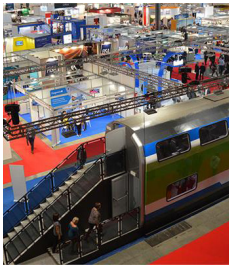
Allianz MiCo, Milan

CITYLIFE NIGHT RUN

The CityLife Night Run is an evening running event in Milan featuring two courses (4.5 km and 9 km) designed to promote wellness and heart health, combined with music and entertainment.

Annual, mid of Septemer

CityLife District, Milan

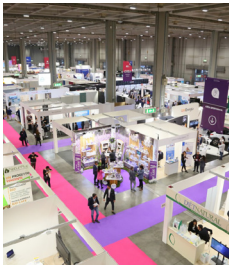


EXPO FERROVIARIA

Expo Ferroviaria is Italy's premier exhibition for the railway industry, showcasing innovations, technologies, and services essential for rail transport, while facilitating networking and collaboration among industry stakeholders.

Annual, end of Septemer

Fiera Milano Rho, Milan



SALONE FRANCHISING MILANO

Salone Franchising Milano is an essential event focused on franchising and retail, showcasing industry trends, networking opportunities, and innovations in the sector.

Annual, end of Septemer

Allianz MiCo, Milan

MILANO FILM FESTIVAL (MFF)

The Milano Film Festival is an annual independent film festival that showcases a diverse array of films, including works from emerging filmmakers, student projects, and feature-length films. It also includes masterclasses and workshops, making it an excellent platform for networking and learning within the film industry.

Annual, late September until October

Porta Venezia District, Milan

OKTOBER

POMERIGGI MUSICALI

Pomeriggi Musicali is an Italian classical music orchestra, renowned for its concerts and performances. Founded in 1945, it features a wide range of orchestral works, opera productions, and concerts, often highlighting both classical and contemporary pieces.

Annual, runs from October to June

Teatro Dal Verme, Milan

ICAMP

The congress focuses on advancements in aesthetic medicine, dermatology, and anti-aging treatments. It features over 300 scientific contributions, including studies, workshops, and video presentations on various procedures and cosmetic developments.

Annual, early October

Centro Congressi Stella Polare, Milan

EBHC Conference

The EBHC Conference focuses on “Artificial Intelligence and Digital Transformation in Research and Healthcare.” It aims to explore the integration of AI technologies in evidence generation, synthesis, and translation to improve healthcare outcomes. The conference features discussions on the latest advancements in these fields from leading international experts.

Annual, mid October

NH Milano Congress Centre, Milan

CPhI WORLDWIDE

CPhI Worldwide is the leading global pharmaceutical event, showcasing the entire supply chain from ingredients to finished dosages, with over 45,000 professionals expected to attend. This event includes co-located shows like P-MEC, InnoPack, and BioLIVE, focusing on the latest innovations in the pharma industry.

One-time, early October

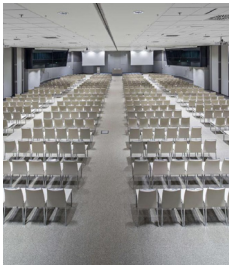
Milano Fiera Rho, Milan

BC - DCIM

(BioProduction Conference - Delta Cure International Meeting) This international meeting will focus on the latest research and advancements in virology, pathogenesis, epidemiology, and antiviral treatments related to Hepatitis D. It aims to foster scientific exchange among professionals in the field.

One-time, mid October

Fondazione Cariplo - Conference Center, Milan

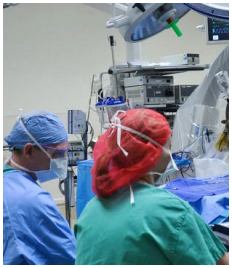


IPD

This conference focuses on drug safety, regulatory affairs, and the latest trends in pharmacovigilance, featuring expert presentations and discussions on adverse event reporting and risk management.

Annually, late October

Not disclosed yet, Milan



ICRAMS

Aims to bring together researchers, engineers, and scientists to discuss recent advances in medical science. It provides a platform for presenting new research results and fosters communication among professionals from various scientific disciplines

One-time, late April

Not disclosed yet, Milan

EYE SYMPOSIUM

The Eye Symposium focuses on advancements in ophthalmology and eye care, featuring expert talks, discussions, and networking opportunities among professionals in the field.

One-time, early June

Centro Congressi Fondazione Cariplo, Milan

GISE

The GISE Congress is a national conference focused on advancements in interventional cardiology. It includes scientific presentations, industry exhibitions, and networking opportunities for professionals in the field.

One-time, late November

MiCo Concress Center, Milan

IHCIS

The Italy Health Care Innovation Summit is a significant event that focuses on digital transformation, therapeutic innovation, and public-private collaboration in the healthcare sector. It aims to gather experts and stakeholders to discuss advancements and the future of healthcare in Italy.

Annual, early October

Hotel Nhow, Milan

CWC CONFERENCE

The CWC Conference focuses on labor rights and the intersection of workers' capital and investment stewardship. It brings together trustees, trade unionists, and experts to discuss strategies and share insights on these critical issues.

One-time, early October

Not disclosed yet, Milan

ICLS

International Conference on Law and Society. This conference provides a platform for students, researchers, and academicians to discuss recent trends in law and society, fostering an environment for knowledge sharing and networking.

Annual, early October

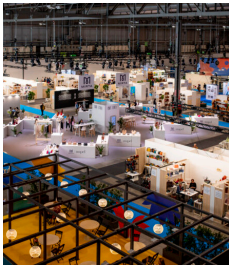
Not disclosed yet, Milan

VERY SHORT FILM FESTIVAL

Is an international event showcasing films of less than 4 minutes across various genres and themes.

Annual, 7-11 October

Various cultural venues in Milan, such as the Institut Français.



MICAM & MIPEL

Are two international trade fairs held together, showcasing footwear (MICAM) and leather goods (MIPEL) from top global brands.

Twice a year, February and September

Fiera Milano Rho, Milan

FLUG MARKET DISTRATTI

Is a creative market event featuring vintage items, artisanal products, live music, and street food in a lively, bohemian atmosphere.

Annual, September

Parco Esposizioni Novegro, Milan

DIY

Is an international trade fair dedicated to the DIY (Do-It-Yourself) and home improvement sectors, showcasing tools, materials, and innovative products.

Annual, October 9-11.

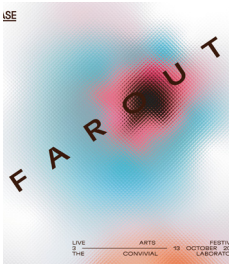
Fiera Milano Rho, Milan

LE VIE DEL CINEMA

Is a film festival that celebrates cinema through screenings, discussions, and events featuring both Italian and international films.

Annual, October

Theaters and cultural venues across Milan and more



FAROUT LIVE ARTS FESTIVAL

Features a variety of performances and events aimed at exploring social and individual postures through artistic expression. It includes a blend of theater, dance, music, and visual arts, inviting audiences to reflect on sustainability, community, and the future of activism.

Annual, beginning to mid October

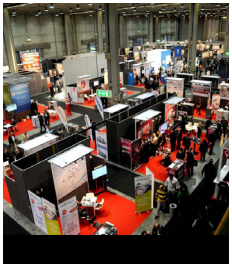
BASE Milano, Armani/Silos & Barona & Giambellino District

FIERA MILANO

Fiera Milano is one of the largest exhibition centers in Europe, featuring a range of international trade fairs across various sectors including food, design, technology, and hospitality. It serves as a hub for business meetings, networking, and showcasing innovation.

Annual, mid October

Milano Fiera Rho, Milan



SMAU

SMAU Milano is the premier event for innovation in Italy, bringing together over 150 startups, corporates focused on open innovation, and institutions dedicated to technology and innovation. It serves as a dynamic platform for networking and exploring new business opportunities, and guided tours called Startup Safaris, where participants can discover innovative solutions across various sectors.

Annual, late October

Fiera Milano City, Milan

NOVEMBER

ISRC

This symposium brings together researchers and clinicians to discuss recent advancements in various fields of research and clinical practice. It provides a platform for networking and sharing insights.

One-time, mid November

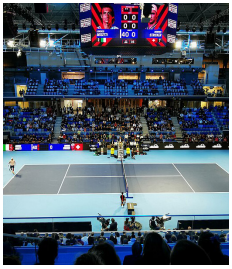
Università Vita-Salute San Raffaele, Milan

EPC

The European Pharmacovigilance Congress is a prominent event that focuses on drug safety, risk management, and pharmacovigilance practices. It gathers professionals from the pharmaceutical, biotechnology, and clinical research sectors to discuss the latest advancements, share insights, and network with industry experts.

Annual, late November

Milan Marriott Hotel, Milan



TENNIS MILANO INDOOR

The Tennis Milano Indoor event is part of the ATP Next Gen Finals, showcasing the top 21-and-under players from the ATP Tour. It features an innovative format designed to engage younger audiences and highlights rising stars in tenni.

Annual, mid November

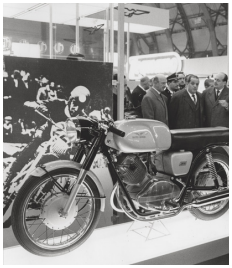
Allianz Cloud, Milan

EXPO2EXPO

Expo2Expo is the first European event dedicated to companies providing products and services for trade fairs and event organizers, focusing on innovation, sustainability, training, and safety in the events industry.

Annual, end of November

Fiera Milano Rho, Milan



EICMA

EICMA (Esposizione Internazionale Ciclo e Motociclo) is the premier international exhibition for the motorcycle and bicycle industry, showcasing the latest trends, products, and innovations in two-wheelers.

Annual, beginning to mid November

Fiera Milano Rho, Milan

PICCOLO GRANDE CINEMA

This festival promotes creativity and curiosity around film, featuring around 50 titles across various competitive sections, including international and school competitions, along with workshops and seminars aimed at film education for young audiences.

Annual, mid November

Cineteca Arlecchino and Cineteca Milano MIC, Milan

BOOK CITY

BookCity Milano is an annual literary festival that celebrates books and reading through a variety of events, including presentations, readings, and discussions, all focusing on new practices and themes related to literature.

Annual, mid November

Diffuse event in the city, historical libraries and bookstores

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MILANO AUTOCLASSICA

Milano AutoClassica is a premier exhibition celebrating classic and sports cars, showcasing vintage automobiles from various eras, including iconic models and unique pieces, alongside engaging activities like auctions and seminars for automotive enthusiasts.

Annual, mid November

Fiera Milano Rho, Milan

SMART BUILDING EXPO

The Smart Building Expo is a leading Italian event focused on building automation, smart technologies, and system integration, showcasing innovations that enhance sustainability and efficiency in construction and urban development.

Annual, mid November

Fiera Milano Rho, Milan

HALF MARATHON

The Milano21 Half Marathon is an annual running event that offers participants a chance to experience a scenic 21.1 km course through the historic streets of Milan, featuring iconic landmarks such as the Duomo and Castello Sforzesco.

Annual, end of November

Via Arona, Milan

MUSIC WEEK

Milano Music Week is a vibrant celebration of music in Milan, featuring concerts, workshops, and events that showcase both emerging and established artists across various genres.

Twice a year, late May & late November

Activities and performances will occur at various venues throughout Milan

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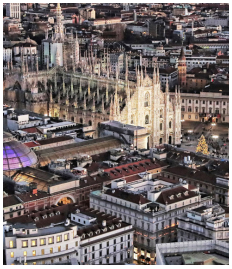


CAM

The CAM Annual Conference is a prominent event focused on arbitration, exploring various themes in the field, including economic implications and the role of damages in arbitration. This year's conference will feature discussions on how to claim, prove, and substantiate damages, as well as insights into the role of third-party funding.

Annual, end of November

Not disclosed yet, Milan

DECEMBER

ICMN

This conference focuses on the latest advancements and research in material science and nanotechnology. Topics include smart materials, nanotoxicology, nanomedicine, and applications of nanostructured materials across various fields. It aims to bring together researchers, scientists, and industry professionals to share their insights and innovations.

Annual, early October

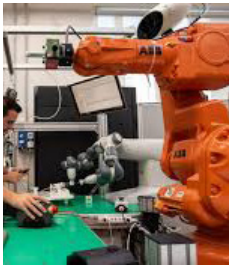
Hilton Hotel, Milan

MBN AESTHETIC BREAST MEETING

His conference focuses on aesthetic and oncoplastic surgery, featuring discussions on contemporary topics and techniques in breast surgery. It aims to foster knowledge sharing among professionals in the field.

Annual, mid December

MiCo Milano Congressi, Milan



GRC Robotics

The Gordon Research Conference (GRC) on Robotics will focus on various aspects of robotics, featuring discussions and presentations on innovative topics such as intelligent systems, sensors, actuators, and collective intelligence. This event aims to bring together researchers and practitioners from academia and industry to share cutting-edge developments in the field of robotics.

One-time, early December

Four Points Sheraton, Milan

OBEI OBEI

Obei Obei is one of Milan's oldest Christmas markets, featuring a vibrant atmosphere filled with stalls selling antiques, crafts, toys, and festive food, all in celebration of Saint Ambrose's feast.

Annual, early December

Castello Sforzesco, Milan

ARTIGIANO IN FIERA

The Artigiano in Fiera is a renowned international fair showcasing crafts, handmade goods, and culinary delights from various countries. Artisans present their products and share their stories, promoting cultural heritage and local traditions. The fair also features live performances, culinary exhibitions, and opportunities to engage with artisans directly.

Annual, late December

Fiera Milano Rho, Milan

EAST MARKET XMAS

The East Market is a popular indie market in Milan that showcases vintage items, handmade goods, and unique second-hand pieces. It features various vendors selling eclectic products, alongside food and beverage options that include street food trucks and local culinary offerings. The Christmas edition is particularly anticipated as it provides a great opportunity for holiday shopping.

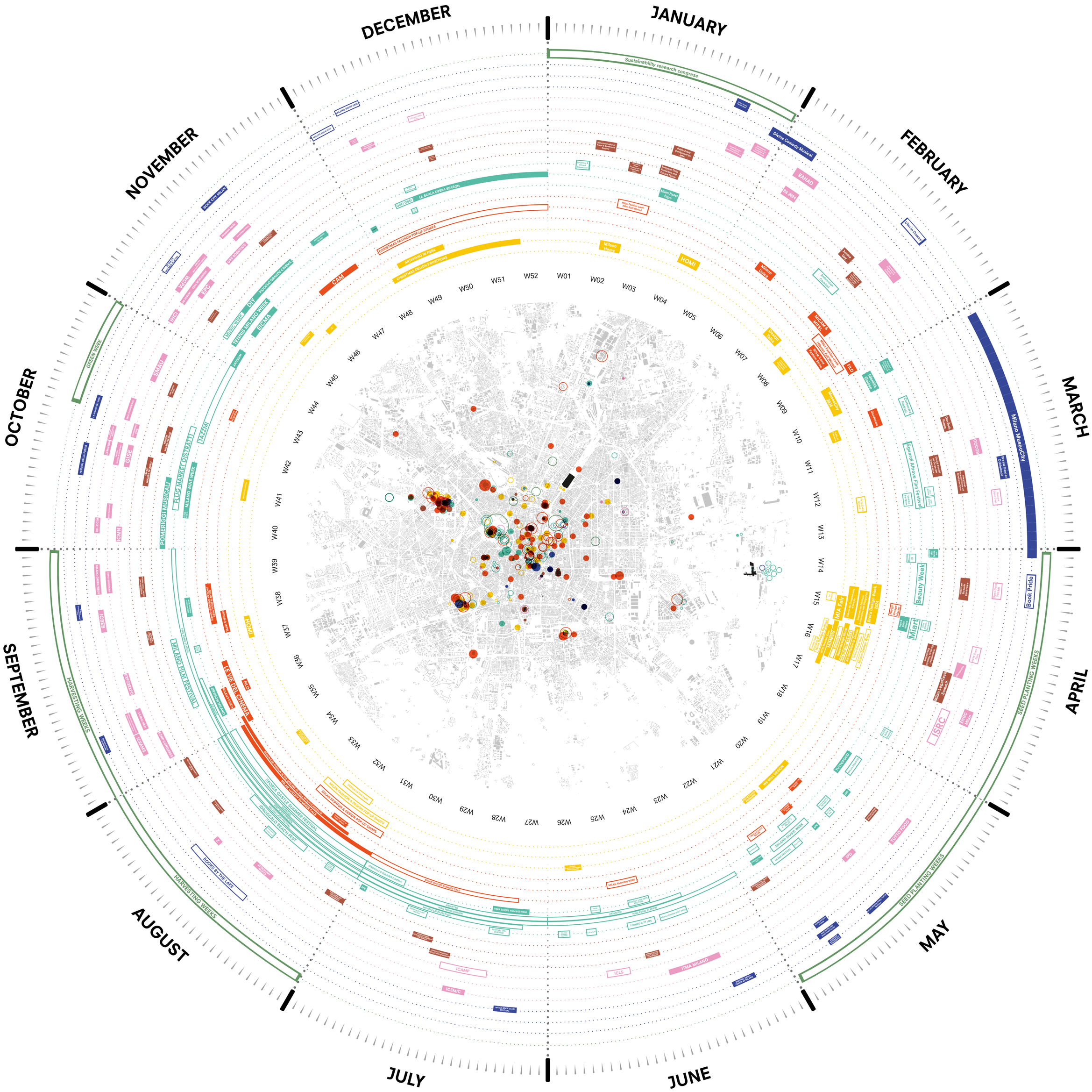
Annual, mid December

Via Mecenate, Milan

Appendix 3: Event calendar

complex CP projects

MILAN YEARLY CALENDAR


DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
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W48
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Sustainability research congress
Divine Comedy Musical
EAHAD
Bit 2024
Milano Home
HOMI
Milano Unica
Alchimia Contemporanea
MICAM & MIPEL
Milano Fashion Week Women's Fashion Week
Milano Fashion Week Men's Fashion Week
BLO
Homi Fashion & Jewels
Cosmoprof
Cosmopack
Mipap 2024
Esposizione Universale 2025
Salone del Mobile.Milano
Fuorisalone
Alcova
Ventura Lambrate
Ventura Centrale
Ventura Presents
Ventura Future
Operae Festival
Operae Fringe
Operae Digital
Operae Summit
Operae Awards
Operae Academy
Operae Talks
Operae Lab
Operae Partners
Operae Press
Operae Community
Operae Volunteers
Operae Ambassadors
Operae Alumni
Operae Mentoring
Operae Workshops
Operae Networking
Operae Events
Operae Partnerships
Operae Media
Operae Collaborations
Operae Initiatives
Operae Programs
Operae Projects
Operae Activities
Operae Opportunities
Operae Resources
Operae Support
Operae Guidance
Operae Feedback
Operae Evaluation
Operae Assessment
Operae Recognition
Operae Awards Ceremony
Operae Gala Dinner
Operae Networking Event
Operae Alumni Reunion
Operae Community Service
Operae Volunteer Opportunities
Operae Internships
Operae Job Placement
Operae Career Development
Operae Professional Development
Operae Leadership Training
Operae Mentorship Program
Operae Scholarship Program
Operae Financial Aid
Operae Grants
Operae Donations
Operae Fundraising
Operae Sponsorship
Operae Partnerships