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REVIVING AN ABANDONED SITE BY THE APPLICATION OF SUSTAINABLE URBAN STRATEGIES

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ABSTRACT

Being a student of sustainable design and architecture one's mind immediately jumps to thoughts about buildings of the future, new technologies, and the latest strategies to achieving the most eco and environmentally friendly building. While all this is actually relevant to the sustainable design, a huge part of sustainability actually deals with old and existing buildings and structures. Some of which may be still in use and occupied and some completely abandoned and uninhabited. This is due to the reason that one can sometimes find value in an already existing building, whether it is historical, technical, economical, or environmental value. And as sustainable design students it is our role to find this value in order to preserve it and work upon it thus saving the previous value, future efforts, and consumption.



Fig.1 Cars Racing at Lingotto Factory 1920

INTRODUCTION

With cities growing faster than ever, and more people relocating towards cities and the value of good urban planning, architecture and infrastructure will only increase. As urban planning and architecture will play a huge role in this rapid growth and will either help in allowing this growth to occur with ease or end worsen the conditions of cities as they grow. Therefore it is important to make sure the inhabitants and the environment are protected and recognised as the priority. Now and more than ever sustainability is being demanded in the fields of urban planning and architecture as it trying to address not only the present but also the future. Providing efficient and **sustainable cities** with proper infrastructure that would cater for current and future generations. And Turin city as a whole is being regenerated and developed with many goals and targets to be accomplished by the near future.

The goal of this project will be reviving one of the many abandoned historical automotive and industrial sites of Turin by transforming an old and deserted industrial site in Turin into an interactive, productive, sustainable zone that follows the strategies of a sustainability. The transportation field was heavily influenced and developed in Turin, as our site was also a car factory in the older times, however automotive

field is advancing at an incredible pace. The automotive industry just like the architectural one is moving towards a more sustainable future with the introduction of electric cars, hybrid cars, hydrogen cars and etc. With that the architecture of and urban fabric of Turin is developing and so are the sites of many industrial areas and structures like show in the figure below that the city of Turin aims to redevelop.

The project strives to be more responsive to the issues that are now facing the built environment, food, health, and economics. The goal is to make suggestions for potential solutions for the infilling of new projects as well as the reuse of existing and abandoned structures and infrastructures. By beginning with a summary of Turin, we can study and investigate the principles of adaptive reuse that are most appropriate for our situation while also incorporating the rules and guidelines of sustainable urban planning and eco-cities. After that, we'll look at Turin's industrial history and the nearby structures to develop a new design concept for the neighborhood and building we've chosen.

SUSTAINABLE URBAN STRATEGIES

MEANING OF SUSTAINABILITY

To be able to understand and apply sustainable strategies to architecture and urban design we must understand the sustainable development and its basis. From an international perspective we will find out that it has been discussed for a while now, and many conventions and discussions have been presented since the early 90s and some even during the 70s. These discussions didn't always just tackle architecture, in fact it started with some examinations on the effects of technology and industrialisation on the environment, humans, food, agriculture among many others. Including studying the harms of production and consumption of products and resources. Finding the side effects on the environment and the human, the efficacy of production techniques and resources. Most of this falls under the naming "Sustainable Development". According to the Brundtland report this addresses the ability to maintain all human activities in all different fields to provide the

needs of the society without harming the future societies' ability or the natural environment. It also talks about the use of the natural resources and the rate at which it is renewed naturally without depleting these resources for future needs.¹

And although some of these discussions are not completely directed towards architecture, they do in one way or another affect it and require its development in certain ways. These are important because they can be seen as the catalyst behind the search for more sustainable architecture and environmentally friendly buildings and go hand in hand with technological improvements and research developments. Especially since buildings play an important role in the progression and growth of our societies. Thus we can easily notice how architecture is closely related to the sustainable development of the world.



Fig.2 Paper from the Stockholm Conference 1972

¹ "Our Common Future "Brundtland report" - United Nations." United Nations Sustainable Development, <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf?dtid=oblgzzz000659>.

“SUSTAINABLE DEVELOPMENT MEETS THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR OWN NEEDS”

Brundtland report

Some of the main conventions regarding these topics originated in Europe, and they are important for the fact that they paved the road for more studies and discussions to be made on the development of the continent and even the world as whole for all industries. One of the earliest conferences on these topics is the Earth Summit in Stockholm (UNCHE) United Nations Conference on Human Environment. It was held in 1972 by the UN and provided the Stockholm Declaration which is a set of 26 principles for protecting the environment. And while more than one of these principles can be applied for architecture. There is one principle that says: “Human settlements must be planned to eliminate environmental problems.”²

Another major publication that greatly influenced later conventions was the Brundtland Report published in 1987 by the World Commission on Environment and Development (WCED) and it was then that the first definition of sustainable development was introduced. In 1987 the Montreal Protocol was released and they both tackled the climate change and the consequences of many harmful activities, for example CFC gases which are harmful to the ozone stratospheric layer and banning it.

² “Stockholm Declaration .” UN Environment Document Repository Home, <https://wedocs.unep.org/bitstream/handle/20.500.11822/29567/ELGP1StockD.pdf>.

In 1992 appeared the most notable action plan at that time, the Agenda 21. This agenda is one of the many documents resulting from the Earth Summit held in Rio by the United Nations Conference on Environment and Development (UNCED). The Agenda 21 was a voluntary action plan to be followed for a sustainable development throughout the 21st century and it led to the Kyoto Protocol in 1997. Which was an international treaty directed to the most industrial countries of the world to reduce their emissions of greenhouse gases which many of these countries signed and agreed to these targets.

The Kyoto Protocol was different than the previous environmental attempts because it was binding and required commitment even from the authorities and governments. Since it targeted the reduction of GHG emissions we must notice that at that time buildings accounted for 6 percent of the global production of these gases whether through production of materials

used and construction processes all the way to the user phases. Therefore we can notice how architecture and building construction are closely related to the environment and how it can even be harmful if not planned and executed thoughtfully.

Fig.3 Climate Change Poster



Again in later years more conferences and movements appeared aiming at reducing the harmful emissions and preserving the climate, like the Covenant of Mayors in 2015 which allows local authorities to achieve so by using renewable and efficient energy resources. Also in 2015 was held the 21st UN Conference on Climate change in Paris called United Nations Convention on Climate Change (UNCCC). Were 196 countries agreed to lower its emissions that contribute to global warming, however there was no sanctions or penalisations for those who didn't stick to the targets.

One of the latest and current international action plans was the UN Sustainable Development Goals also known as the Agenda 2030 was introduced in the 2015 United Nations Summit on Sustainable Development and was adopted by 193 countries. It was an agenda made up of 17 sustainable development goals targeting a wide range of issues including goals for architecture, building and construction sectors.

“The Sustainable Development Goals aim to address a wide range of issues related to economic and social development, including poverty, hunger, the right to health and education, access to water and energy, employment, inclusive and sustainable economic growth, climate change and environmental protection, urbanization, production and consumption patterns, social and gender equality, justice and peace.”³

The goals tackled in the UN SDGs are general yet can be applied in terms of architecture and urbanization and there are actually three out of the seventeen goals almost directly targeted at architecture and construction. As the SDGs number 9, 11, and 12 aim at innovations in industries and infrastructure, sustainable cities and communities, and responsible energy consumption and production which we thus can aim at reaching these goals in our project.



Fig.4 The UN Sustainable Development Goals (SDGs)

³ Press release - UN General Assembly's Open Working Group proposes sustainable development goals (PDF), on Sustainable development. un.org, July 19, 2014. Retrieved October 18, 2016.

EU GREEN DEAL

Nowadays Europe as a whole is following many new strategies in order to improve the sustainability of many sectors. The strategies come in many different shapes whether as Deals, policies, guidelines, certifications, regulations, and even competitions. The scale of each and every strategy differs than the other as we have strategies that can range from a national level all the way down to smaller local scale and even personal level.

The EU Green deal is one of the most recent and leading current sustainable movements being implemented by the European Commission and European countries. It provides a roadmap to achieve a sustainable EU economy that acknowledges the environmental challenges we are facing today and conducts all the activities needed by the economy while facing these challenges. It targets all sectors of the economy and their production of pollution like transport, energy, supplies, industry, and buildings.

Many of targets aimed at by this deal is shared with the aims of green architecture and sustainability of our project such as the efficient use of materials and resources, preserving the climate, protecting biodiversity, and reducing pollution.

The deal was presented in 2019, and presents strategies that will allow the whole continent of Europe to become climate neutral by 2050 with a budget of over 1 trillion euros. In addition to becoming climate neutral it aims to improve on the condition of the environment and the general quality of life and allow the continent to grow in a smart, efficient, and clean manner. It is considered relevant to our research as provides some requirements for upcoming and current buildings that they should follow, and achieve a certain level or standard in terms of sustainability.



Fig.5 EU Green Deal Aims

ELEMENTS OF THE EU GREEN DEAL

Almost all of the targets and aims of the EU green deal can or are somehow connected and can be applied to architecture. Therefore when planning our project we should keep in mind the main elements of the green deal so we can apply the methods needed to achieve these targets when designing our project. Trying to follow the agenda of the EU green deal and thus will ensure a high quality and relevant project in terms of environmental sustainability.

The main element of the EU Green Deal is Climate Action as the deal will work on reducing the EU's greenhouse gas emission levels by a percentage between 50% and 55% compared with 1990 levels.⁴

1. Clean Energy

Finding renewable energy sources is essential for the EU agreement to meet the goal of being climate neutral because energy production processes account for about 75% of greenhouse gas emissions while renewable resources only account for 17.5%. Member states will need to enhance their national energy plans, their energy efficiency, and their reliance on more renewable and cleaner resources in order to attain "net-zero greenhouse gas emissions" by 2050, which contributes to a more circular system. Moving away from dirty energy sources and toward clean ones like hydrogen.

2. Sustainable Industry / Circular Industry

Resources are being extracted and used more and more, which is leading to pollution, biodiversity loss, and resource depletion. This issue can be resolved in part by recycling and reusing materials and resources, which is also one of the key ideas of a circular economy. The development of recycling techniques for

common building materials like gravel, sand, cement, and steel, which require a lot of energy to produce and produce a lot of waste, is one example of how new technologies and industrial advancements are assisting in the development of this circular industry.

3. Buildings and Renovations

40% of the energy used in Europe is utilized for construction and renovation, including energy required for building materials, construction, and building use. The majority of them come from non-renewable sources. New construction should be able to use less energy and feature more effective temperature control systems.

4. Eliminating Pollution

The commission will implement the "Zero Pollution Action Plan" in 2021 with the goal of eliminating all pollution and purifying the air, water, and soil. The plan also emphasizes eliminating frequently produced dangerous wastes including microplastics and toxins.

5. Farm to Fork

The Farm to Fork plan takes into account the issue of food sustainability as well as food production and delivery techniques. The agreement will work to increase organic farming and agriculture by minimizing the use of harmful pesticides and fertilizers, implementing enlightening food labels, and reducing food waste.

6. Preserving Biodiversity

The final and most important component of the EU Green Deal is closely related to architecture since it has the power to either destroy or protect biodiversity in a specific location or even an entire region. The preservation of

⁴ Euractiv, Frédéric Simon for. "The EU Releases Its Green Deal. Here Are the Key Points." Climate Home News, Climate Home, 12 Dec. 2019, <https://www.climatechangenews.com/2019/12/12/eu-releases-green-deal-key-points/>.

wildlife, species, and their environments is a necessary component of environmental protection. Ursula von der Leyen, president of the European Commission, stated that by 2030, cities should strive to return the environment to its pre-architectural state, if not better, because *“making nature healthy again is key to our physical and mental wellbeing and is an ally in the fight against climate change and disease outbreaks.”*⁵

It is key to our growth strategy, the European Green Deal, and is a component of a European recovery that benefits the environment more than it depletes it. 30% of the sea territory and 30% of the land area are to be protected, according to several EU biodiversity strategies by 2030. by 2030, planting 3 billion trees

and rehabilitating at least 25,000 kilometers of rivers.⁴ The EU Green Deal is reflected in design, as shown by the fact that each of the deal’s eight components may be applied to sustainable architectural development in some way. Particularly given the extreme relevance of issues like climate, energy, mobility, technology, agriculture, biodiversity, and the environment to the field of architecture.



Fig.6 The “Ruhr InnovationCity, Modellstadt Bottrop” project is an innovative model for Bottrop, a city in the German Ruhr area which has been developing ideas and innovative solutions to face the challenges of climate and structural change in urban areas since 2010. The “Bottrop laboratory” showed how it was possible to put in place a climate friendly urban re-arrangement and to secure industrial sites.

⁵ Leyen, Ursula Von der. “Beautiful, Sustainable, Together.” New European Bauhaus, https://new-european-bauhaus.europa.eu/index_en.

EU COMMISSION ON GREEN BUILDINGS

We spend a lot of time in buildings. The structures we visit frequently use fossil fuels for energy or have poor insulation. Many people are not equipped to handle climate change's effects, such as floods and heat waves. We need to construct better new buildings and remodel existing ones in order to make our buildings more environmentally friendly, as the majority of them will remain in use for many years to come.

To enhance the energy efficiency of buildings around the EU, the European Commission has announced a Renovation Wave. By 2030, refurbishment rates should have doubled, and it should be made sure that these increases improve resource and energy efficiency. This suggests that by 2030, up to 160,000 new green jobs might be created in the construction industry by renovating 35 million buildings.

When discussing the growing commitment to developing a sustainable, competitive, secure, and decarbonized energy system, the EU Directives 2018/844 of the European Parliament and of the Council of May 30, 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive

2012/27/EU on energy efficiency are important references.

The Member States are required to establish guidelines to reduce the energy impact of lighting, water, heating, and cooling. Different construction parameters have been devised to deal with this directive.

For instance, a creative public-private partnership (PPP) called Sustainable Housing Europe has been established in the housing industry (SHE) This project promoted the construction of eco-friendly dwellings in France, Italy, Denmark, and Portugal and provided pertinent findings. According to simulations, it will be possible to save 40% on heating, 100% on cooling, and 20% on water use.⁶

⁶ "Green and Sustainable Buildings: The Need for People's Commitment." LabGov, 5 Jan. 2021, <https://labgov.city/theurbanmedialab/green-and-sustainable-buildings-the-need-for-peoples-commitment/>.

POLICIES ON SUSTAINABLE DEVELOPMENT



EUROPEAN POLICIES



TURIN POLICIES



Turin is developing a climate adaptation strategy to ensure a high quality of life, promote sustainable development and encourage innovation. In early 2018 the Mayor's Cabinet, with the support of other services approved a municipal resolution to establish a cross-sector working group to develop the **Climate Adaptation Plan**. The development of this Plan is embedded in the Turin 2030 Action Plan for a Sustainable and Resilient Turin, is integrated with the revision of the General Urban Masterplan and is included in the Administration's annual operations program which details the objectives of each department for the year.

Europe

Increasing of built surface in 2000-2010 in Europe



Italy

Increasing of built surface in 2000-2010 in Italy



Turin

Variation of built surface in Turin

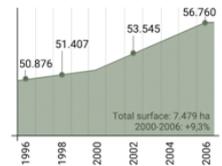


Fig.7 Policies on Sustainable Development

DIFFERENCE BETWEEN GUIDELINES AND CERTIFICATIONS

The built environment is the single largest energy consumer in the EU and one of the largest carbon dioxide emitters. And the US Green Building Council (USGBC) reports that 40% of worldwide energy usage comes from the construction industry, with it estimated to increase by 1.8% by 2030. With these figures rising we are witnessing more and more sustainable building certifications and popularity of these programs.

Although these green building certifications **go hand in hand** with agendas and conventions like the EU Green Deal and the UN sustainable development goals, these certifications are **different**. Certifications are more private evaluations and are applied to every building separately and exclusively. And once a building achieves a certain number of points against a pre-defined scale they are awarded these certificates with different ranks.

Thus it can be said that they function on a smaller scale than Guidelines, which can tackle continents, countries, and cities. Moreover, Guidelines and conventions are usually implemented by official authorities and regimes that are then passed on to private

individuals and organizations.

The LEED program is one of the most well-known and significant certification programs. Despite having its roots in the United States, it is now significant not only there but also globally. Every green feature installed to a building receives points under the three-tiered LEED point system, with the overall number of points determining the structure's certification status and tier eligibility.

An other international certification program is the WELL Building Standard. However, this standard primarily focuses on the people who inhabit a building and ensures that the areas are safe for both work and living. As the first architectural norm that focuses solely on human health, the WELL building standard makes this claim. This program focuses on a variety of topics, including air, water, nutrition, light, fitness, comfort, and the mind.

Another is the international program known as BREEAM certification, which stands for Building Research Establishment Environmental Assessment Method. In addition to focusing on other categories like waste and materials, the

BREEAM program also addresses many of the same areas that other certification programs do, including air, water, and health. Despite having its roots in the US, this accreditation is now widely used.

There are other other initiatives around the world, such as Green Globes and the Living Building Challenge, in addition to the building certifications already listed. Common goals with many of them include enhancing energy, water, and air quality. The graphic below gives us an idea of how widespread green building

certifications are becoming. With almost 124,200 LEED-certified structures, the United States leads the world in the number of green buildings. The country with the second-highest number of green structures worldwide is China, followed by Canada, which has about 3,000 LEED-certified structures.

Table 1: The top five countries with the most green buildings

Country	Number of buildings
United States	124,212
China	5,678
Canada	3,066
India	2,246
UAE	2,029

Fig.8 Top countries with most green LEED Buildings

USING THE GUIDELINES AND CERTIFICATIONS AS A GUIDE

A “green” building is one that minimizes or eliminates harmful effects on our climate and natural environment during design, construction, or operation. It can also have positive effects. Green structures protect priceless natural resources and raise our standard of living. And they are tackled in detail in both guidelines and certificates.

Therefore combining the teaching and methods of the guidelines and conventions of the specific area a project is located in to make sure it goes along with the country or region, and then go on to apply the strategies that are targeted by green certificates. Doing so will allow a comprehensive approach to reach a green design suitable for the specific area and at the same time up to world and international standard of green design certifications.

For this reason, it is clear, that not all green structures can or should be the same. Different nations and areas have various qualities that influence how they approach green building, including specific climatic conditions, local cultures and traditions, a diversity of building kinds and ages, or broad-ranging environmental, economic, and social goals.

As for the use of these different guidelines and certifications, they provide us with certain standards that we can examine and decide voluntarily how we can implement them into our designs depending on the site of our project, aim, usage, and type of project or building. They are non-the-less very beneficial to compare our own proposals against these guidelines and policies and examine how we perform in comparison with these set of guides and other projects that followed them. To discover also how successful our results are against the requirements and standards set by these guides.

It is important to be able achieve the targets set by these guidelines and certifications as much as possible especially in times like the ones we are going through nowadays. With the climate being very sensitive to pollution, more scarcity of natural resources, and growing populations.



Fig.9 Birds-eye View of Paris

GREEN URBANISM IN EUROPEAN CITIES

In addition to the universal and international sustainable guidelines and certifications. It is important to look for already existing real life implementations and actual proven applications of these strategies in the cities and environments around us. As some of these cities were already implementing sustainability in their architecture and urbanism before many of the guidelines and certifications. And as the American author and urbanist Timothy Beatley mentioned “European cities remain a great source of potent ideas and inspiring practice”⁷ author Timothy Beatley explored how nowadays we can learn from the way urbanization is handled in some European towns that have accomplished a genuine sustainable urbanization. And in some instances green urbanism can be noticed even in some of the most progressive metropolitan centers in Europe.

As mentioned earlier, sustainable urbanism is not a new concept or term in Europe; it has been well-known in European cities since the early 1990s. It is clear that in addition to cities there are also many European towns that pioneer in this sector. Especially because successful sustainability is sometimes practiced at smaller scales. For example even on an individual, architectural, local, or municipal level. Therefore we should aim to achieve a similar success even on a small scale like an abandoned site or empty area of a city.

Moreover, by looking at how sustainable strategies and development in some cities was implemented even with restraints of already present buildings and sites and existing historical significance will assist us more to handle the maintaining and improving of a site with existing structures and restraints.

⁷ Timothy Beatley. Green Cities of Europe : Global Lessons on Green Urbanism. Island Press, 2012.

Many of Europe's top cities for sustainability have integrated sustainable practices into their own administration. For instance, Paris has its own planning and regulations where it focuses on renewable energy, green spaces, and energy efficiency in the city's urbanism like architecture and construction.

Paris is regularly ranked among the great world cities, and its history, economy, culture, and iconic landmarks make it the most visited city in the world. It ranks as one of the most liveable cities of the world (Monocle 2010) with a high quality of life and a thriving economic activity (Knight Frank 2010).

In addition to that, France and the city of Paris even aimed for sustainable development that protects the local and global environments and the climate. Thus adopting many guides and frameworks over the years like the "Charter for the Environment" in 2005 and the "Grenelle de l'Environment" in 2007. Both these provided policies and objectives for the whole of France. In addition to the Paris Climate Plan that focuses on energy used by buildings and transportation of users, aiming to reduce GHG emissions by 25%, to consume 25% less energy, and to use 25% of the city's energy from renewable sources by 2020 compared to 2004, and to reduce emissions by 75% by 2050.⁸

The city of Paris faces many challenges like the ones in Turin and even many areas near the site area of our project. Such challenges include struggle of residents to find adequate and affordable housing, traffic congestion, stressful commutes, and poor air quality and many others. In the city of Paris we can examine how green urbanism is practiced in different areas and ways like:

Buildings Performance, Energy Use, and Pollution

In addition to the regional planning schemes and laws in France for any large scale urban project and not just architectural but all fields. There are a set of local plans some of which are voluntary and some compulsory that any new building must follow. Making sure any local plan or project must be in line with the regional plan and take climate change into consideration. The city of Paris is now encouraging the increasing of the energy efficiency and performance of both old and new buildings whether private or public.

We clearly see why this is important for such a city to improve the performance of its buildings as in the private sector only there are around 1.4 million housing units in 96,000 buildings in Paris, the majority of which are run by condominium organizations. Using thousands of watts of energy and producing millions of tons of CO₂. And similar to the buildings in Turin and our site many of the buildings in Paris are old with 85% of buildings constructed before 1975, 48% before 1915, and 25% before 1850. (Ville de Paris 2007d; APUR 2010a). And in most cases buildings built before the 1970s typically have poor insulation which the municipality is aiming at renovating and improving the thermal insulation up to green standards thus reducing emissions.

⁸ Timothy Beatley. Green Cities of Europe : Global Lessons on Green Urbanism. Island Press, 2012.

Public spaces, Urban Agriculture, green areas, and Biodiversity

The public welfare and quality of public spaces is greatly related to green spaces as they can provide protection in the summer and cooling, insulate sounds, and improve air quality. Paris is increasing the proportion of urban space devoted to greenery, public, pedestrians, and bikes instead of streets for cars. The city is even providing whole neighborhoods that are quiet and the main priority are the people and the greenery. This improves the quality of life for both the humans, the environment, and other living creatures and preserving biodiversity.

In addition to the current variety of parks and greenlands in the city there is a constant expansion of green areas and increase in the number of trees on land, the city of Paris tries to maximize the green footprint and vegetation of the city by even creating as many green Roofs and green walls as possible and it even has become a trend with over hundreds around the city. Another green trend in the city is the emerging of organic urban farms that are managed and maintained some by private groups and some by public neighborhood residents to make fresh produce. They can be found on rooftops and on land like community gardens which provide new concepts of farming, improve social activity between its residents, provide areas for children, and be a center for local activities and events.



Fig.10 Community Gardens and Roof-top Farming are some of the many Urban Farming forms in Paris, France

Transportation and Mobility

Another positive aspect of Paris is that it is a very walkable city with the priority of mobility going to walking and biking in an attempt to reduce emissions from other methods. Almost anywhere in the city may be reached on foot in five or ten minutes from a Metro or bus stop, a school, a park, a grocery shop, or one of Paris' 82 fresh produce markets. In Paris there are millions of journeys each day, of which more than half are non-motorized on foot and by bike. Trying to also improve public transportation Paris works on rapid bus transit systems, public car and bikes sharing programs, electric tramway lines and the Metro all which are constantly being improved. Reducing the need for cars, pollution, and traffic.



Fig.11 Green walls and green roofs are becoming popular in Paris to increase the green footprint and improve biodiversity in the city

Another relevant examples that can be applied on both small and large scale projects, with concepts that can also be applied on a site even similar to ours in Turin, can be found throughout the city of Copenhagen. Copenhagen is even considered to be the world's greenest city by some experts as the city proved how important and effective sustainability can be nowadays. It was also at some point called The Environmental Capital of Europe. And for years Copenhagen has been setting the pace for sustainability, which has numerous environmentally friendly laws for urban planning, transportation, recreation, and environmental sustainability. In terms of sustainable urban planning, Copenhagen has a long history of being a "green" city including a major regional urban plan that was environmentally friendly in the 1930s. And since then the city implemented as still is implementing various sustainable decisions both in architecture and other fields.

The Finger Plan, which dates back to 1947, is one of the earliest examples of the many sustainable urban solutions. It was a strategic and green urban plan for the future growth of the city. Copenhagen used this regional planning approach to address a variety of issues and prepare for the city's future growth. Its primary goal was to accommodate the development in traffic, housing, business, and population.

Instead of concentrating it in a single core region, this design encouraged urban expansion and growth along suburban train lines that extend out from the city of Copenhagen, like fingers. The Finger Plan, which was implemented by Copenhagen in 1947 to address numerous issues and accommodate the city's expansion and growth, is one example of numerous sustainable urban solutions. Its initial goal was to accommodate the increase in traffic, population, housing, and commercial activity. Instead of concentrating urban development and expansion in one core region, this design spread it out along suburban train lines that radiate from the city of Copenhagen.

The finger plan's key objectives include reducing reliance on private automobiles in urban areas by enhancing public transit and assisting in traffic congestion in metropolitan areas, which will improve the quality of the environment by lowering noise and pollution levels. In addition to this plan the city of Copenhagen has other relevant green tactics like the following ones.

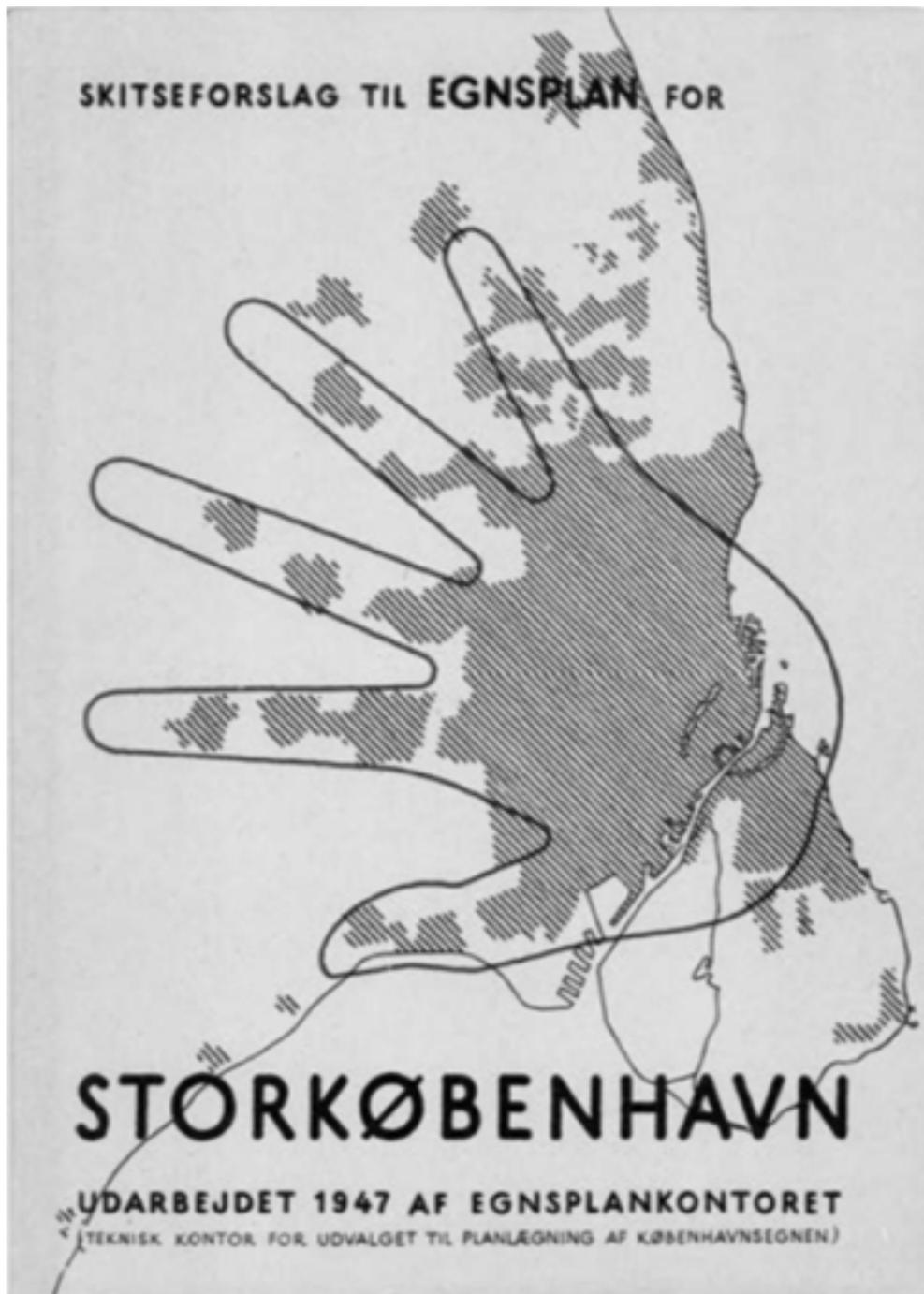


Fig.12 The 1947 Finger Plan is Copenhagen's regional plan for guiding growth along the major rail corridors in the metropolitan area.

Recreation and Leisure Through Nature

Greenery and water are some of the main natural recreational zones in any area. They are important in a highly populated city because they provide opportunities for outdoor recreation, activity, health and well-being, and maintain the ecological balance. They play a significant role in the city's atmosphere and environment. Residents place more value on the neighborhood's attractiveness and accessibility to green spaces than it does on other qualities. In Copenhagen the typical amount of open space per resident in a municipality is about 25 m². And the distance to the nearest green space shouldn't be more than 200 meters from any bus stop. Making sure that green areas are easy accessible, within reach, and available for all residents. Not to mention how trees assist to purify the air, and Copenhagen as a whole benefits greatly from the greenery using it like a lung for the city that forms along the harbor and in the west of the city. Finding new areas for the greening of Copenhagen's not so green neighborhoods is the latest challenge. And it is being solved by the transformation of abandoned industrial and railway locations and adapting them into green recreational areas.



Fig.14 View of Copenhagen Green Areas along the Harbour

Clean Mobility, Renewable Energy, and Resource Monitoring

The city is utilizing Clean Mobility, Renewable Energy, and Urban Greenery to neutralise all of its pollution to 100% in the near future. It is turning into the use of renewable resources of energy like water, wind, and solar. Currently 20% of the city's energy is from renewable resources and it aims to raise it up to 50% by 2030.

The city is heavily bike friendly and relies on clean mobility that limits emissions and pollution. More than 50% of the city And because pollution and emissions also arise from the built environment and its users the city also provisions the distribution of energy, gas, heating, and water, as well as the disposal of waste and sewage. This provision helps reduce the use of resources like building materials, energy, and water as well as the environmental impact of things like trash and environmentally unfriendly elements in the water, air, and soil.

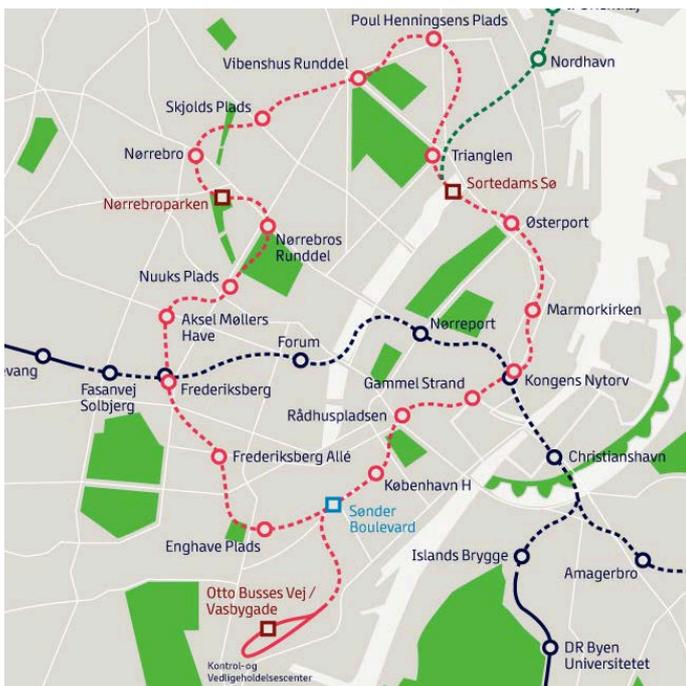


Fig.13 Abundance and vicinity of Green areas around the city and closeness to transportation.

Regulations for Innovation and Sustainability in Green Buildings

Copenhagen has no shortage of green buildings, in fact the city is filled with hundreds of them. Interestingly, not all of them are public as many of them are also privately owned by companies and individuals with the voluntary choice of being so. Even though the city adopted a set of regulations for environmentally friendly urban development in 1998. The rules include requirements that must be met at a minimum by individuals as well as suggestions that can be utilized as models. The rules must be followed for all publicly funded municipal building and construction projects, urban redevelopment, and social housing. Private contractors are urged to abide by the rules as well, and many do, particularly when doing so helps them establish a “green profile”.⁹

The local plan, which specifies the land use and density of every registered site, and the local plan must concur. The local plan sets the precise density, number of floors, building

layout, building materials, preservation of cultural heritage, usage and design of open space, parking, environmental conditions, and other details of the new structure’s detailed land use. There is even still active planning legislation in place in Denmark. According to the objects clause in the Danish Planning Act 7, it aims to ensure that societal interests are taken into account when deciding how to use land and to safeguard nature and the environment for the preservation of flora and fauna. Many of these buildings have many green aspects like heavy insulation, rainwater collection and use, green roofs, solar panels, sea-water cooling, mechanical shading, automated monitoring, and natural ventilation. Some of these aspects can be applied to some of the buildings in our site to assist in increasing the sustainability of our buildings.



Fig.15 View of Copenhagen City from Top of Amager Bakke Waste-to-energy plant in Copenhagen



Fig.16 UN City in Copenhagen, Ultra-Sustainable Buildings and Neighborhoods

⁹ Miljø i byggeri og anlæg” (Environment in Construction), City of Copenhagen, 2009.

URBAN ANALYSIS

TURIN OVERVIEW

CITY CONTEXT

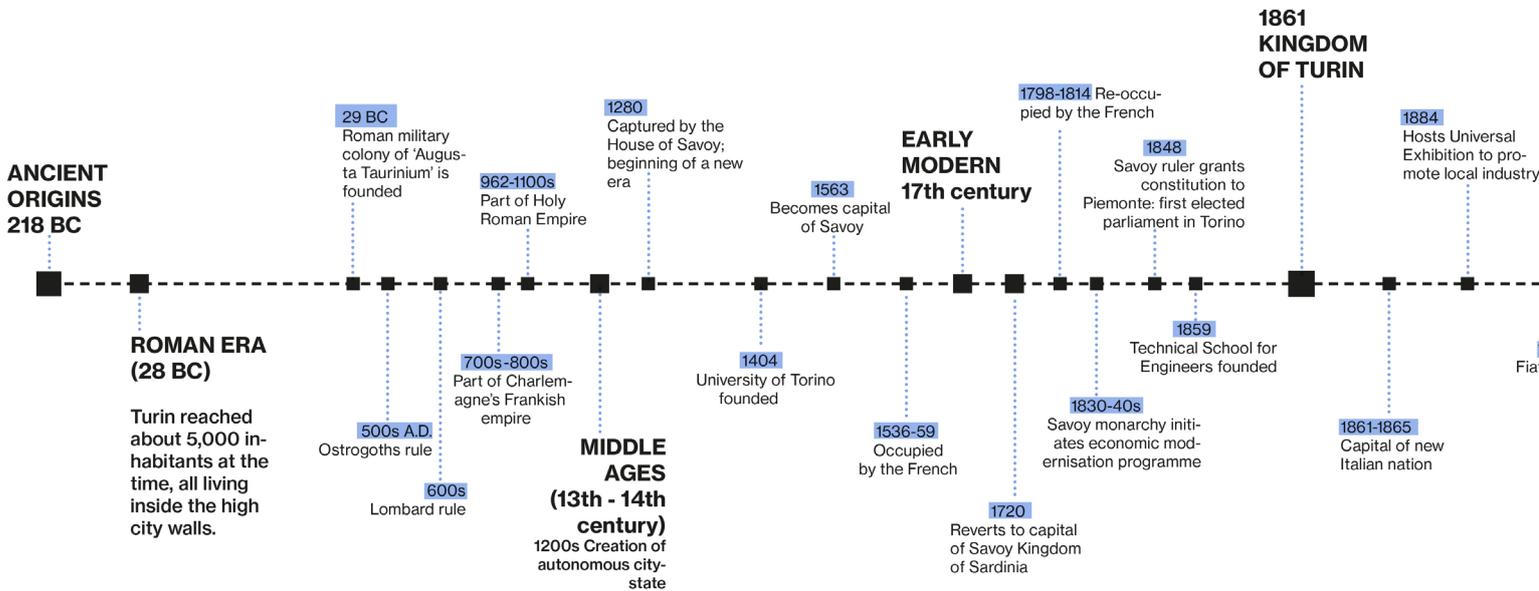
Turin is an interesting case study, it is even mentioned by Le Corbusier to have a unique location, natural geography, and special topographies that gives it all the ingredients needed to become a lively, sustainable, and leading city if these elements are used appropriately. When we ask ourselves what makes a good city? The answer is a city that puts people as the main user. Cities should be lively, diverse, and welcoming for current generations to flourish, solve problems, and provide needs of present and future. This is what we aim to implement to our site in Osi-Ghia. To be able to re-use and revive a previous industrial area of Turin it is important to have a

clear understanding of the city's past both the industrial past and the historical as well. This understanding will be important to assess the present-day situation of Turin and allow us to perform a suitable adaptive re-use scenario with proper space-making techniques that ensures the maximum comfortability and functionality.



Fig.17 View of Turin from Cappuccini Mountains with the Mole around 1954

TURIN CITY TIMELINE



EXPANSION OF THE CITY

Turin has experienced tremendous expansion in the last few decades. The population of the city, the booming economy, technical advancements, and the city's architecture and urban planning are just a few of the changes and advances that came along with this rapid growth. Turin has already begun putting several initiatives and programs into practice that will make the city more sustainable along with its growth. Our site is one of the valuable and unused spaces of Turin that should help in the sustainable urban development of the city in strategic way no matter how small of a scale.

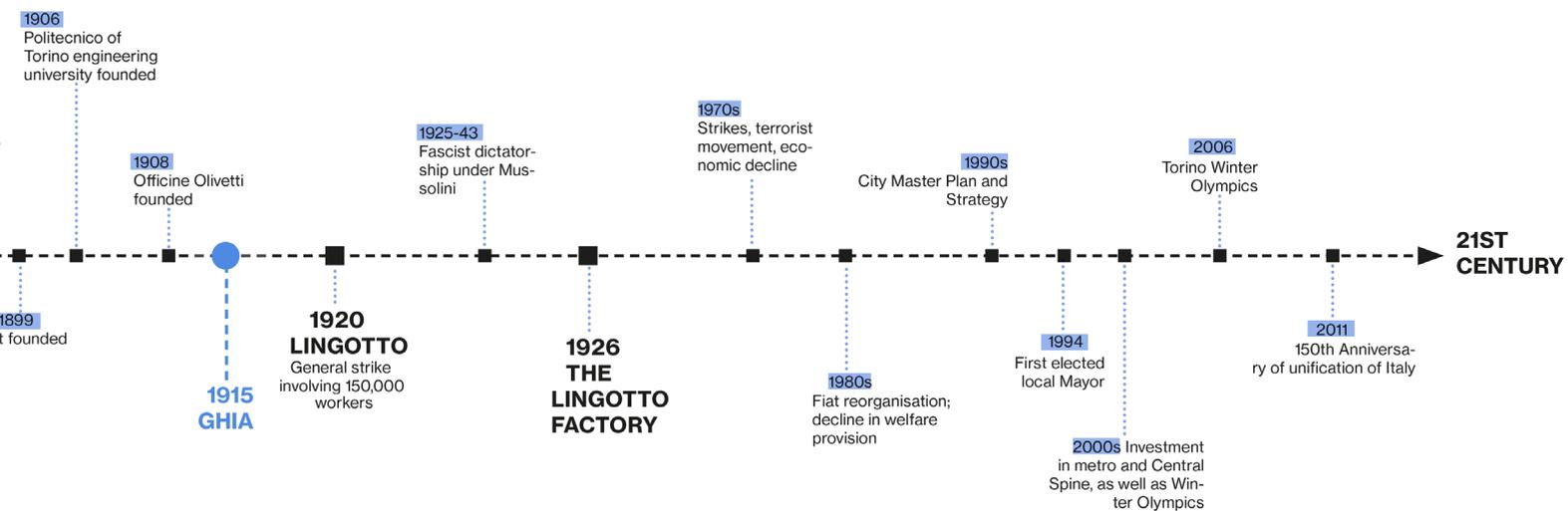


Fig.18 Own Illustration
Timeline of Turin City

POPULATION

Northern Italy's city of Turin serves as a significant commercial and cultural hub. It was the first capital of Italy from 1861 to 1865 and is now the capital of Piedmont and the Metropolitan City of Turin. The city is mostly located on the western bank of the Po River, below its Susa Valley, and is encircled by Superga Hill and the western Alpine arch. There are 852,223 people living in the city itself, but according to Eurostat, there are 1.7 million people living in the surrounding metropolitan area. The OECD pegs the population of Turin's metropolitan region at 2.2 million people.

TURIN ANALYSIS

URBAN TRANSFORMATION AREAS

Our site is located along the many paths and areas of the Turin Urban Transformation Areas, which are basically abandoned areas some made up of previous railway stations and industrial buildings some which have been moved underground and are being used for new purposes and renovations that would benefit the areas surrounding them and the city as whole.

LYNCH ANALYSIS: NODES

The important nodes or points in the city like squares, piazzas and intersections. Some of these nodes are actually some of Turin's principal tourist destinations, places of interest, and leisure pursuits. And some of the nodes are not so popular or touristic yet are major for the city like the urban transformation areas of Turin with are important nodes themselves.

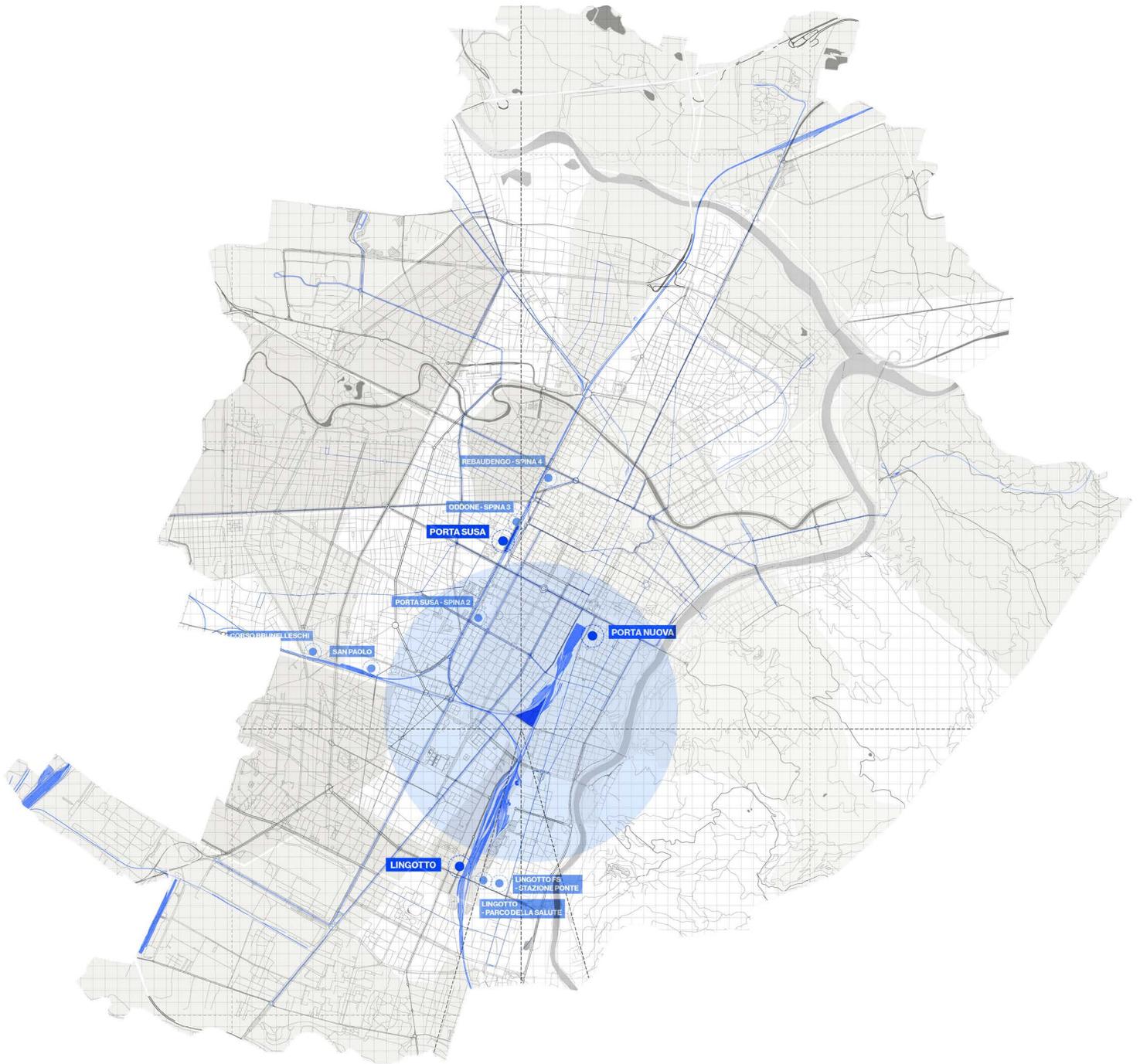


Fig.19 Own Illustration

Urban Transformation Areas of Turin

Map of Turin showing the main abandoned sites and stations in Turin for Urban Transformation and Nodes

TURIN ANALYSIS

MOBILITY

Analysis of our site's location in relation to the city's transit options and accessibility. Buses, trams, and the metro are other ways to get to the location besides by bicycle or foot. Each follows a distinct path, and some have stations that are less than five minutes' walk from our site.

LYNCH ANALYSIS: PATHS

Project is located near Dante Area, the street Corso Dante, and the Dante Metro station. Also it is placed near barriers created by train tracks. These are some of paths and lines in which the people use to move within the city. According to the transport research, the area's central physical location and the smooth operation of public transportation contrast with the dispersed network of bike lanes, so we notice the site is well connected by public buses, trams, and metro but not that well connected and welcoming with bicycles and pedestrian access as you get closer to the site.

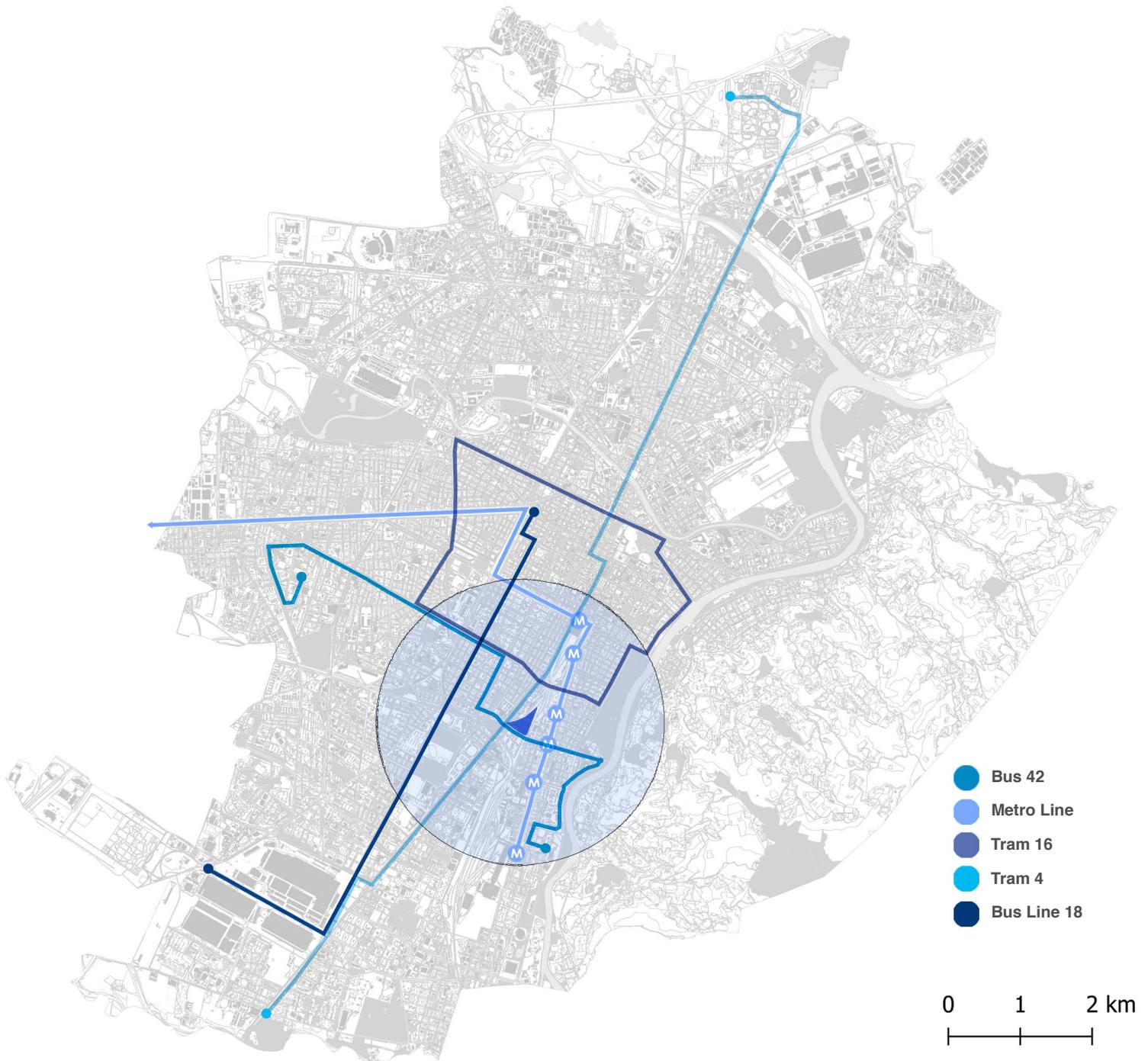


Fig.20 Own Illustration
Main Nearby Transportation lines around the Project Site
Area in Dante, Turin

TURIN ANALYSIS

GREEN AREAS

It is important to identify the closeness and availability of green areas according to our site and the city. Mostly man-made gardens and in our case the natural forests or parks in Turin are considered as well because they are important to the percentage of greenery in the city. We notice how green surfaces are mostly around water bodies and rivers with the closest park and water body being the Valentino Park on the banks of the river Po. Thanks to this and other nearby park there is a small number of green areas within the 2km range, but the data also demonstrates that there are none at all in our site, and no nearby agricultural, and rural ones.

CLIMATE

Like many places of northern Italy, Turin has a climate that is European-humid subtropical. While summers are warm in the hills and extremely hot on the plains, winters are only moderately cold and dry. Rain is mostly expected in the spring and fall; otherwise, rains are less common but heavier during the hottest months (thunderstorms are frequent). Due to the city's location at the mouth of the Susa Valley, banks of fog, which can occasionally be very thick, rarely accumulate on the city during the winter and autumn months. The föhn wind effect caused by its location on the east side of the Alps causes the weather to be drier than on the west side. However the area of our site has no nearby water bodies that can flood or any high areas nearby that can cause dangerous amounts of water flow.

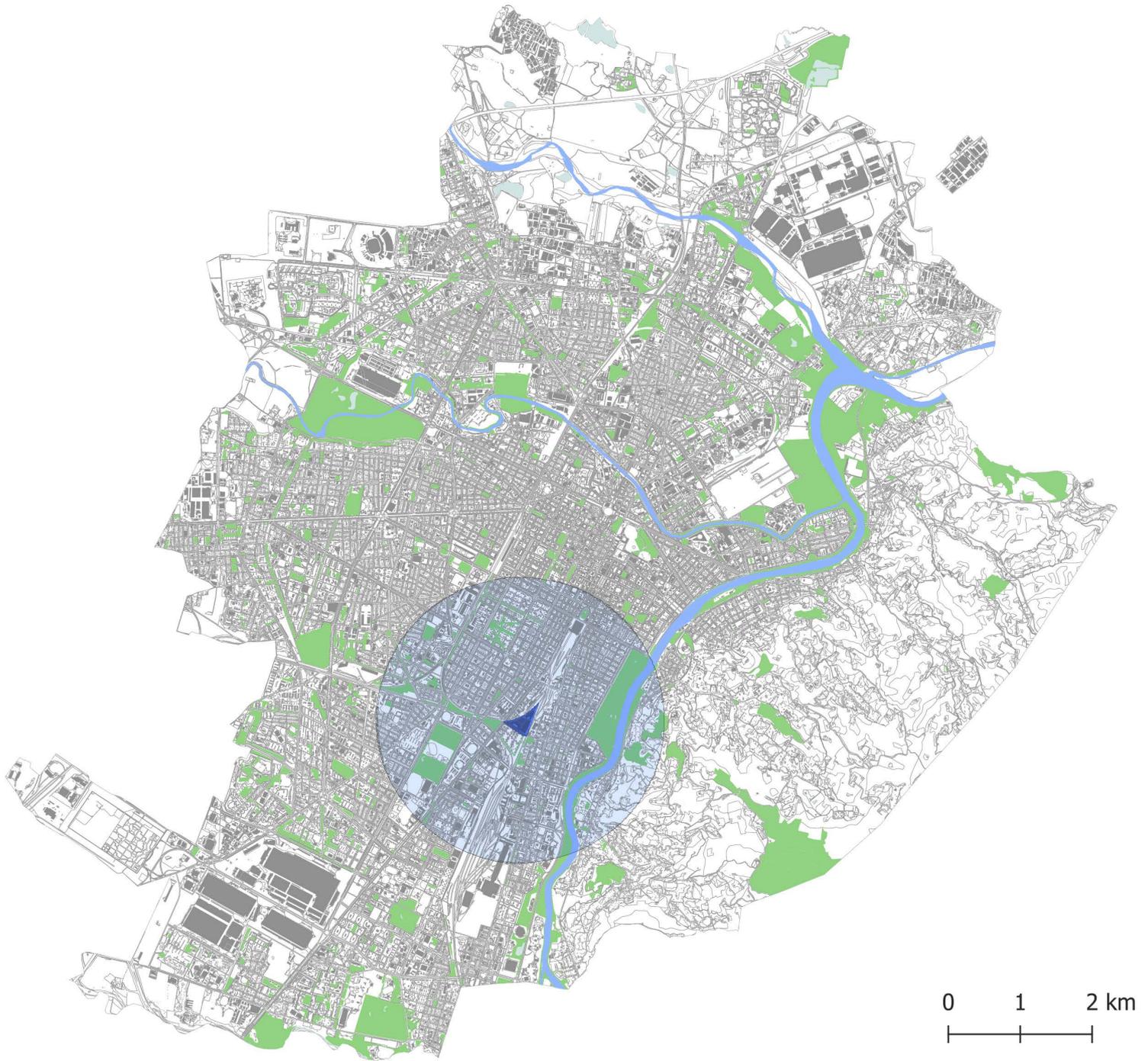


Fig.21 Own Illustration
Geographic Analysis Map
Map of Turin area showing the green areas, agricultural areas, forests, and water.

SITE ANALYSIS

THE SITE

The current site is a triangular area located between two railways that combine to form a triangular tip. These railways combine and join leading to Porta Nuova one of the main arteries for trains to and from this city. The site has a valuable history to Turin, and has been an important hub for different sectors throughout its lifetime. Currently some parts of the site are abandoned and some are built and in use, and others are built and left empty.



Fig.22,23 Views of The OSI Ghia Site from a Birdseye View
Source: Google Earth

Fig.24 View of The OSI Ghia Site from a Birdseye View
Source: Google Earth



SITE HISTORY

A two-story building with a vaulted roof and a wall is constructed in 1956 by the real estate firm Egeo S.p.a. to shut the new Via Egeo (formerly Corso Marsiglia). Carrozzeria Ghia purchases all of the structures in 1958, increasing the covered area with low structures. One of the Italian body shops with the most illustrious past is La Ghia. In this location, around the start of the 1960s, automobiles were handcrafted and designed. In 1960, Ghia and O.S.I merged (Officine Stampaggi Industriali). In order to extend and renovate its buildings, the latter buys the region between Corso Dante and Via Bertini (present OSI est area) from Laminati e Trafilati Spa.

The steady deterioration of the O.S.I company, which was founded by the Giulio Gianetti Saronno S.p.a. company and changed the interiors and the roof of the buildings in the early 1980s, started in 1973. The ownership was given to the firm Ruote S.p.a in 1983, which was later sold to Findata Leasing S.P.A in 1989 and Immobiliare Montefeltro S.r.l in 1998.

Real estate and OSI S.p.a merge at the end of 1998; ownership then transfers to Delfo S.p.a in 2000, who holds control until 2001, when it is completely sold. The OSI-WEST region was still owned by the joint stock business trafilati up until 2001, when I.O.S Spa, the owner of the clothing-related GB Sportelli group, established its commercial warehouses there.

The year 2009 signifies a potential rebirth for the region. In order to construct the TOOLBOX co-working space in the OSI OVEST neighborhood and create a shared work center that evokes a variety of activities in the area, the I.O.S firm relocates its warehouses there. In order to stay up with the times and the significant economic and societal changes, the property allowed for the progressive reuse of the structures.

The Serenissima SGR obtained the remaining land in the same years by proposing a significant urban makeover with residential towers and sizable commercial areas based on Studio Mellano's design guidelines. Mario Cucinella intended to build the new IED campus in the land to the north, but that path was not ultimately taken.

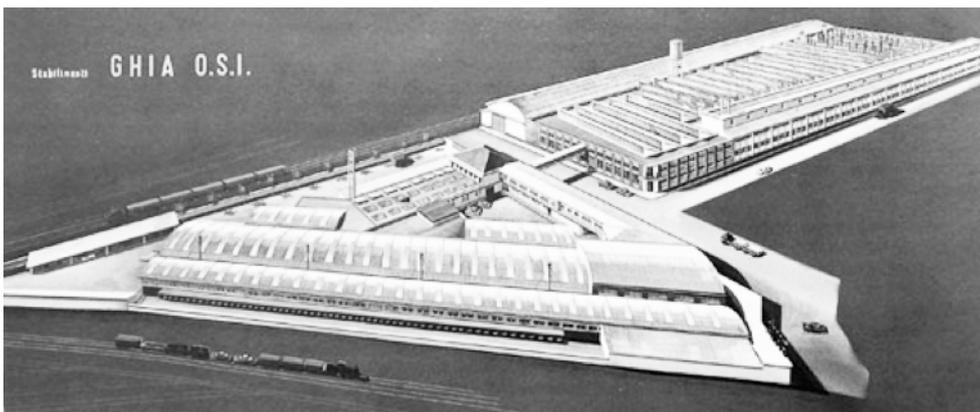


Fig.25 Old Poster View of The OSI Ghia Site

CURRENT BUILDINGS IN THE SITE

The first building in the site was constructed around the 1930s. There are currently three standing buildings in our site and all three of them are currently present and abandoned.

1. F.Ili Miroglio Building (1931/36)
2. Ghia Offices (1958)
3. Ghia Hangar (1958)



Fig.26 Birdseye View of The OSI Ghia Site

CURRENT PLAN OF GHIA COMPLEX

TAV
2-C

AMBITO GHIA

SCALA 1:500

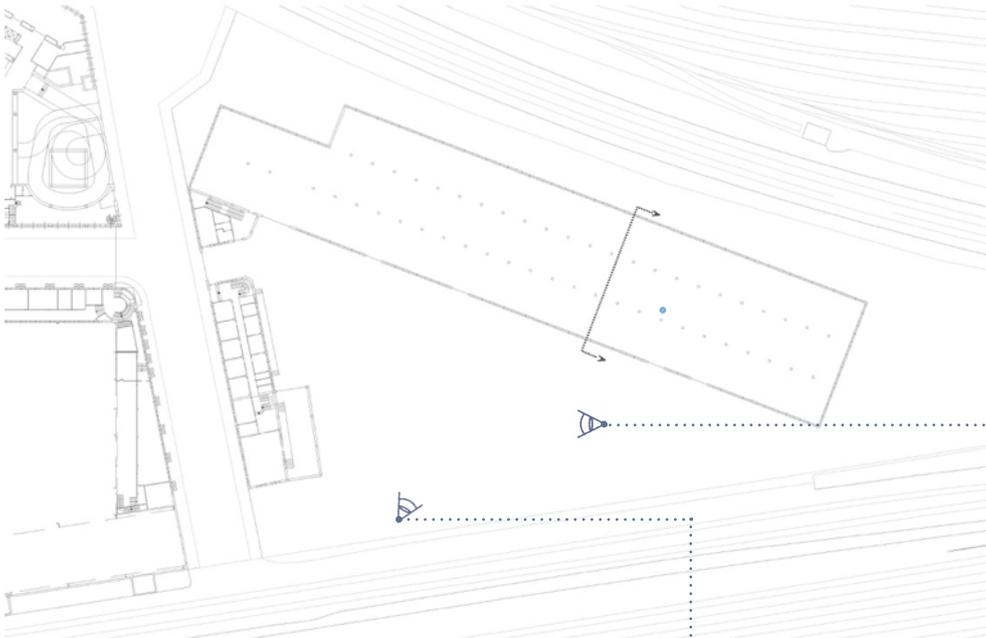


Fig.27 Current GF Plan OSI Ghia Offices Building



Fig.28 Current View of The OSI Ghia Hangar

ELEVATIONS AND SECTIONS OF GHIA OFFICES

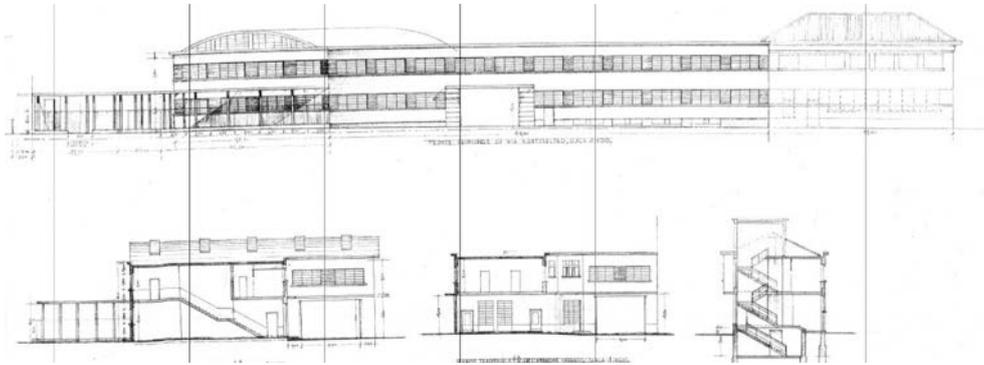


Fig.29 Current Elevations and Sections The OSI Ghia Offices Building
Source: Precedent Thesis

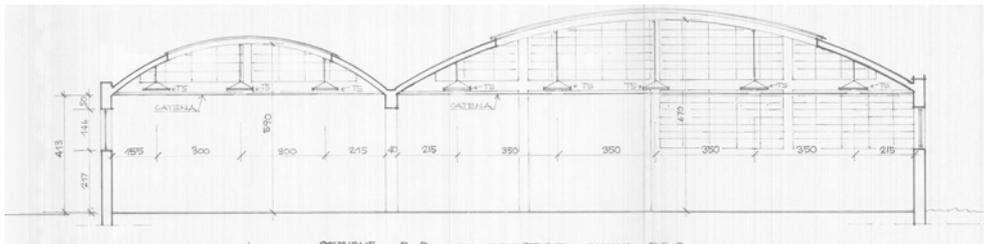


Fig.30 Current Section The OSI Ghia Offices Building



Fig.31 Current View of The OSI Old Office Building

SITE AREA: OSI-GHIA ANALYSIS

ACCESSIBILITY: TOWARDS THE SITE

First thing we notice is that two out of the three sides of our site are blocked by the railways. Meaning we should see if it would be important to create any new connections based on the nearby nodes or attractions on the other side of the railway or just stick to the current access methods and improve on them. The 2 railroads drastically limits the access towards the site. In addition to closed streets on the site and closed underbridge passage.

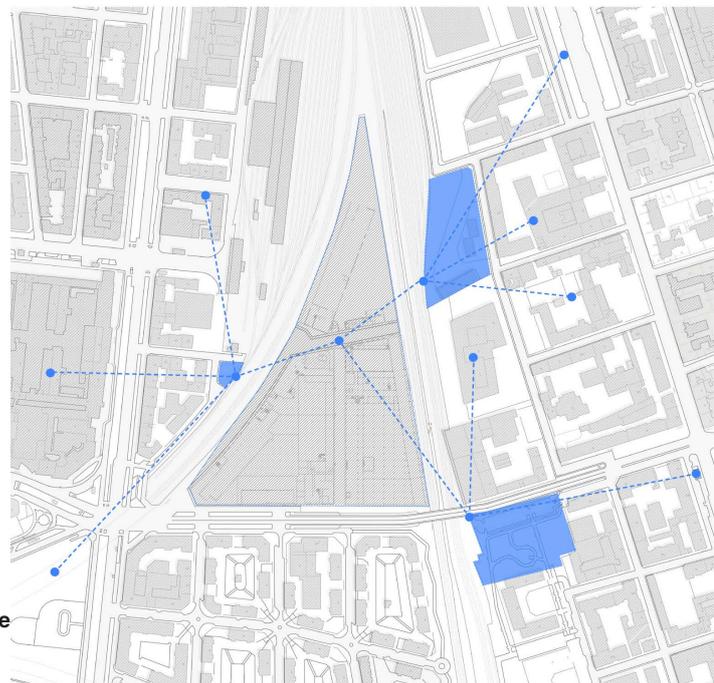
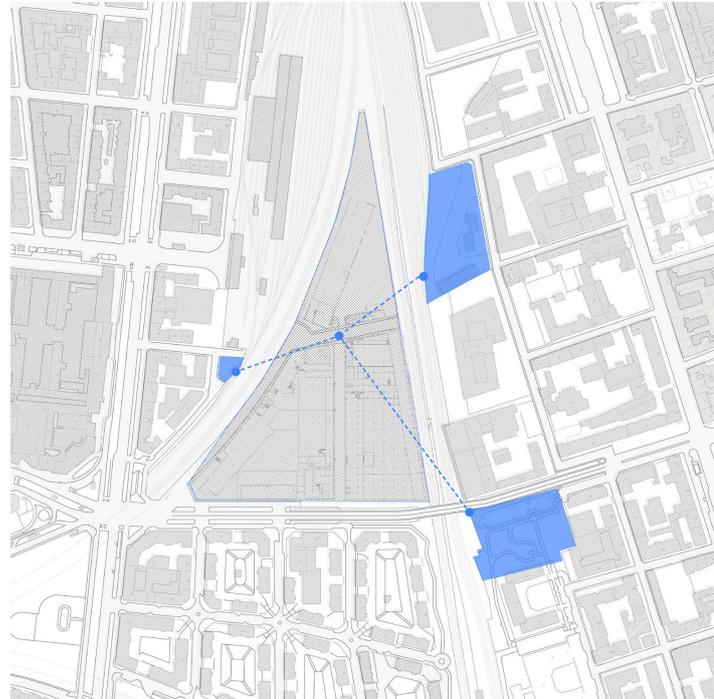
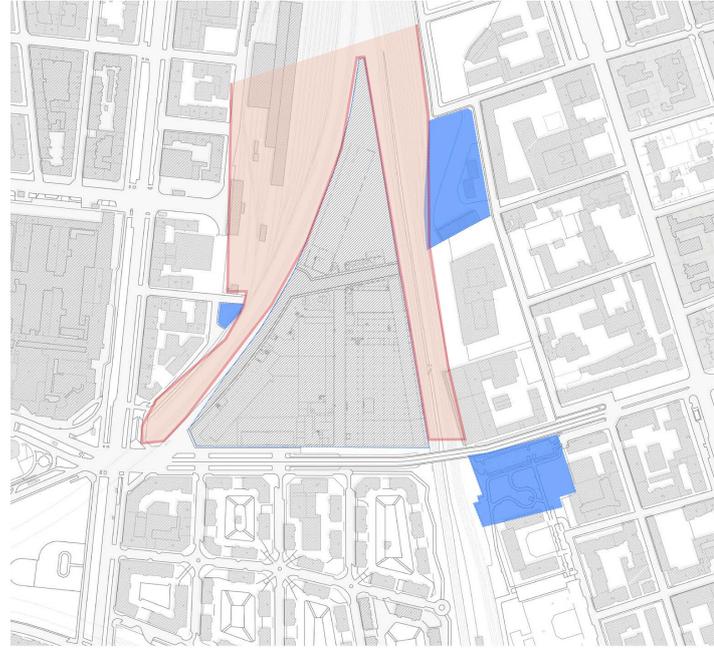
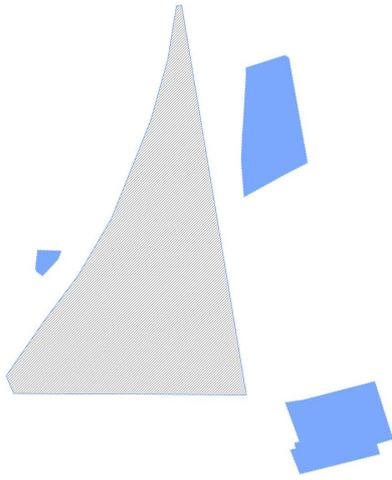
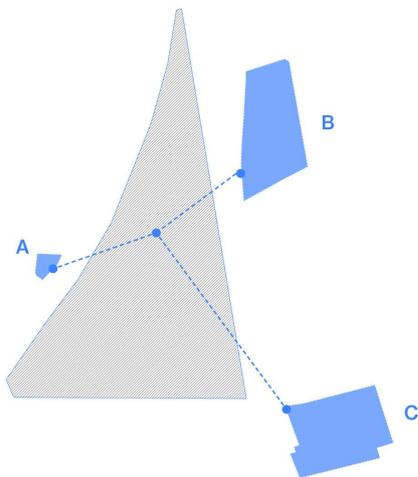


Fig.32 Accessibility and Possible Connections



POSSIBLE CONNECTIONS IN FUTURE

This diagram explains how our masterplan is connected to nearby busy interaction and public green spaces that can be targeted or connected in the future in order to offer continuity, ease of mobility, and harmony to and from our site.



NEABY NODES AND PLACES OF ACTIVITY

We notice that our site is surrounded by some possible strong nodes such as the small green triangle before the hospital on the left of our site, and more on the right side as well with the presence of a university and other major area for employees, workers, and students.

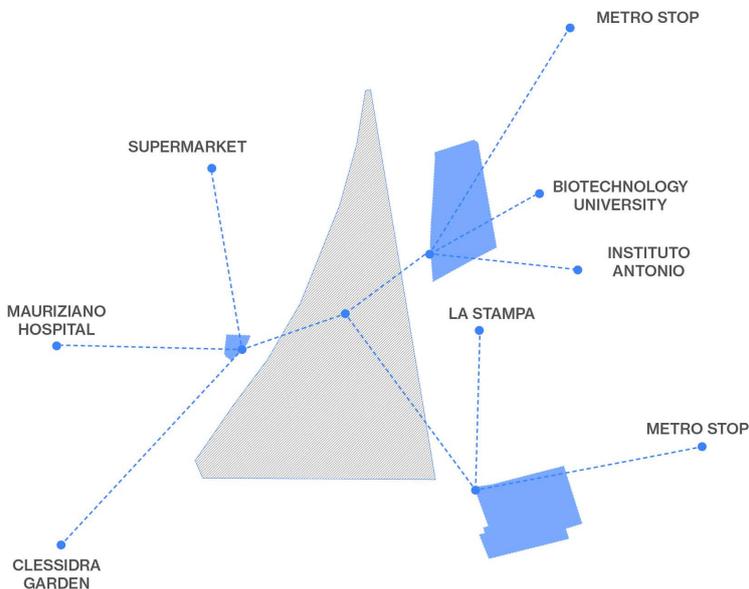


Fig.33 Own Illustration
 Relationship and proximity of site with the Surroundings and busy interaction points.



Fig.35 Own Illustration
Main nearby nodes and attractions.

STREET NETWORK AROUND THE SITE

By their position, Corso Dante and Corso Turati are identified as the most significant streets offering access towards site from different sides. In the same time they offer the most appropriate bus stations in terms of public transport system.

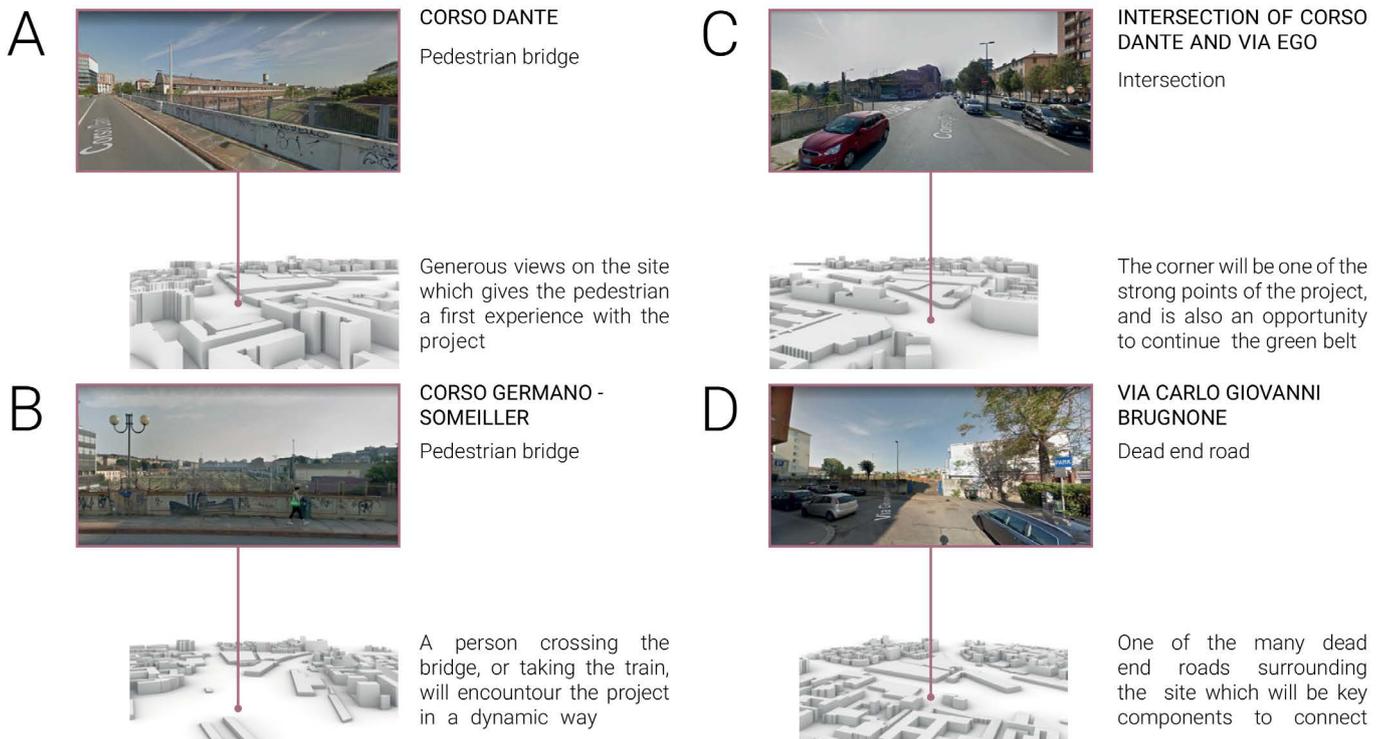


Fig.34 Main nearby views and streets.

MAIN NODES AND ATTRACTION POINTS

Although there are some near attractions we can find out that there are no direct views or access from our site to any green areas or landmarks. Corso Dante is the main axis line and if we improve this line for emphasis on pedestrian and cycling comfort and safety it will improve mobility. Thus connecting these nearby nodes for people and users and possibly attract them with a visual landmark or an attraction point.

If we go a bit further there are major nodes made by the Dante metro station and the intersection with the Madama Cristina street. A main landmark can be the Dante fountain, Valentino Castle and Medieval Village in Valentino Park. The Corso Dante street itself is a main path near the site.

ANALYSIS RESULTS/ CONCLUSIONS

STRENGTHS

Nearby Toolbox, enhancing the area, and provide function. The area can be lively all times of the day.

Near the city center, in between Unito and Polito campuses. Add student facilities, student points.

Vegetation: Closeness to the linear green.
Possibility to continue the green belt

Possibility to implement solar panels, photovoltaic panels and green roofs.

WEAKNESSES

Closed, Isolated complex in the city.

Complex accessible only from one of the three sides

No views, vegetation, green areas, or landmarks in the Site. Urban heat island and impermeable surfaces.

Man-made, Non permeable buildings, abandoned areas.

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OPPORTUNITIES

Renew the neighbourhood by adding new and dynamic construction.

Provide easy, safe and accessible routes near transportation stops to improve mobility to and from the site.

Provide more effective services for the area like shopping areas, open markets, bars and cafes, and public spaces like libraries and museums.

Creation of greenery, porous pavements and green roofs, green courtyards..

THREATS

We notice that the area is **not within the range of users area** of the main parks and attractions of northern areas.

The area face a lack of **public green areas**. And no direct access to the site makes Lynch aspects are quite scarce in the area.

Closeness to the rails: possibility to create a protection from the noise and create a promenade for a more pleasant place.

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CASE STUDIES

01

NEW LAB BY MARVEL ARCHITECTS

New York, USA

This adaptive re-use project proposal transformed this abandoned naval factory into an innovation spot for worker and companies. This large project is now the home for a large number of entrepreneurs as well as members of large companies and corporations.

Achitects: Marvel Architects
Location: Brooklyn, New York
Program: Commercial Adaptive Reuse
Project Area: 84,000 sf
Status: Built
Year: 2016



Fig.36 Current View of the Renovated Exterior

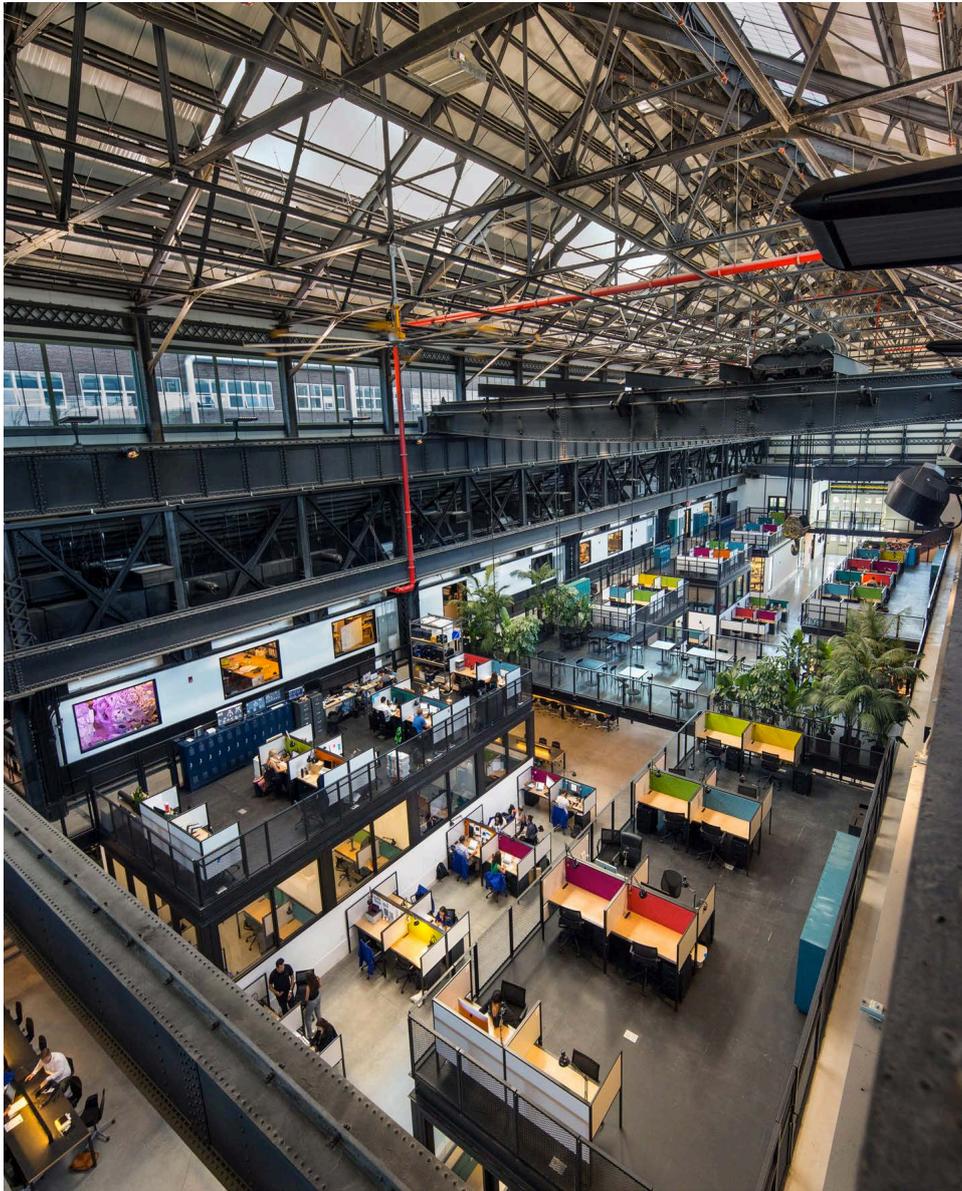


Fig.37 Current View of the Renovated Space

The proposal of this project emphasizes both the new features of this green center and the preservation of the big historic hangar's physical attributes. The industrial skeleton that is still visible is contrasted by transparent pods inside the structure. The idea of a collaborative design is emphasized with communal meeting spaces and inner plazas on both floors that is collaborative, interactive, and pleasant.

BEFORE

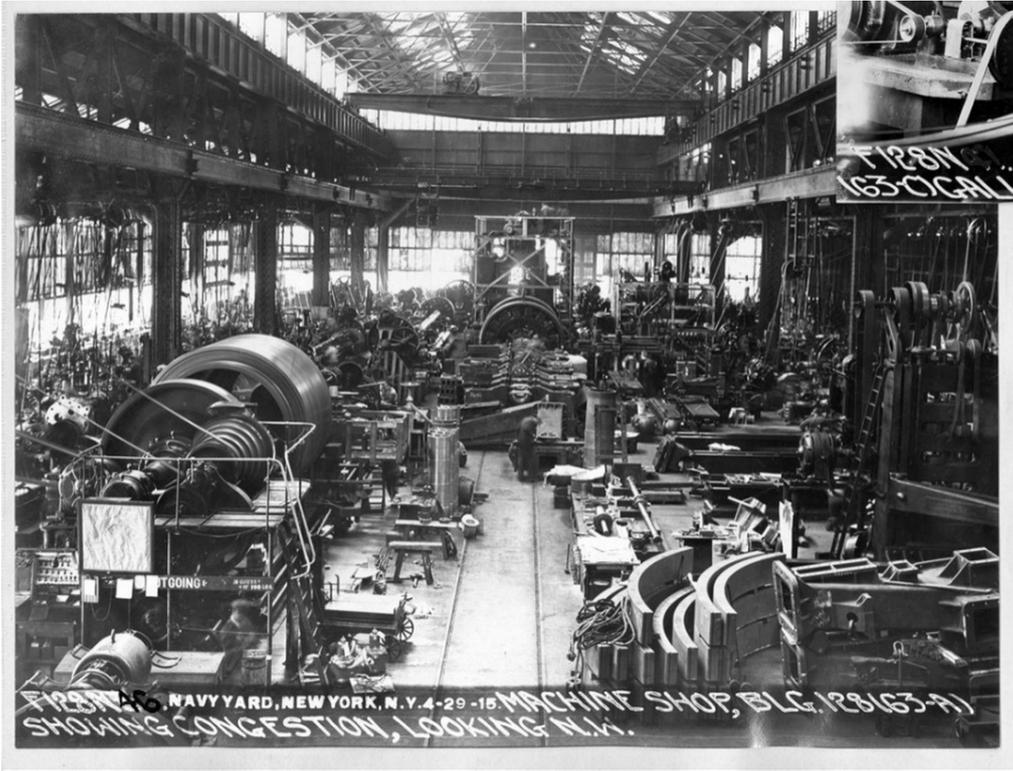


Fig.38 Site in 1915 Previously used as a naval machine shop

AFTER

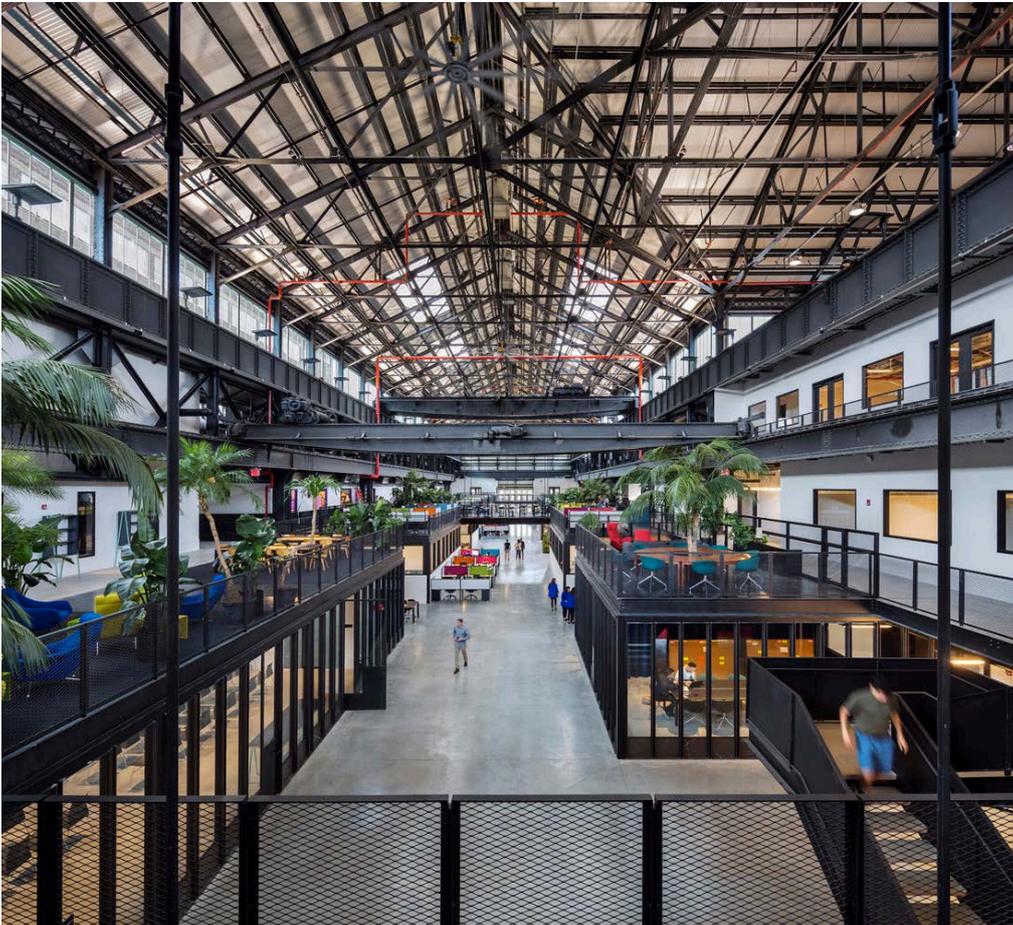


Fig.39 Central Corridor of current Site

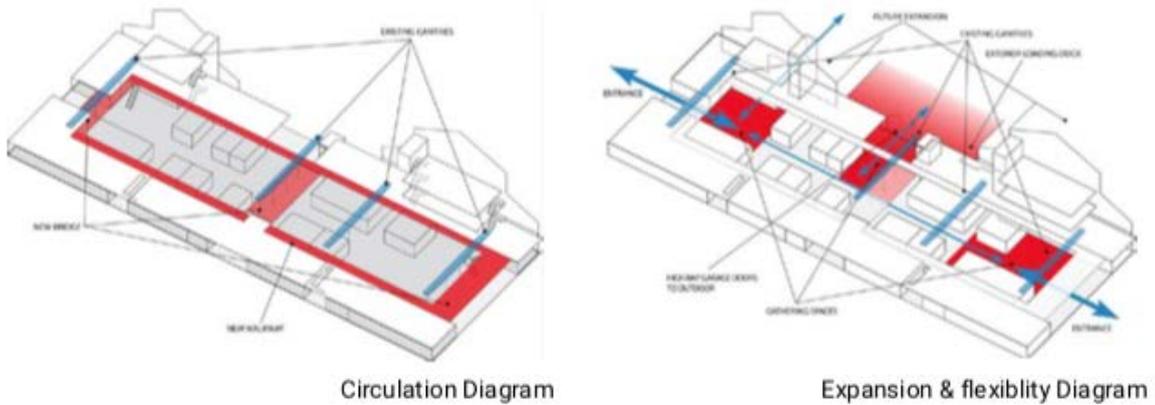


Fig.40 Design Diagrams - Circulation

This adaptive re-use project aimed to preserve the legacy and historical aspect of this structure, yet revitalize it with new functions spaces and technologies. Thus turning it into a productive and creative spot for its users that provides up to date features, layouts, and comfort. Therefore single story stations have been built inside the hangar and have been placed along a central corridor for circulation and more horizontal circulation.

1. Design Library
2. Enclosed Studio
3. Fabrication Lab
4. Project and Event Room
5. Conference Room
6. Institutional Studio
7. Enclosed Studio
8. Open Studio



Fig.41 Design Section - Program

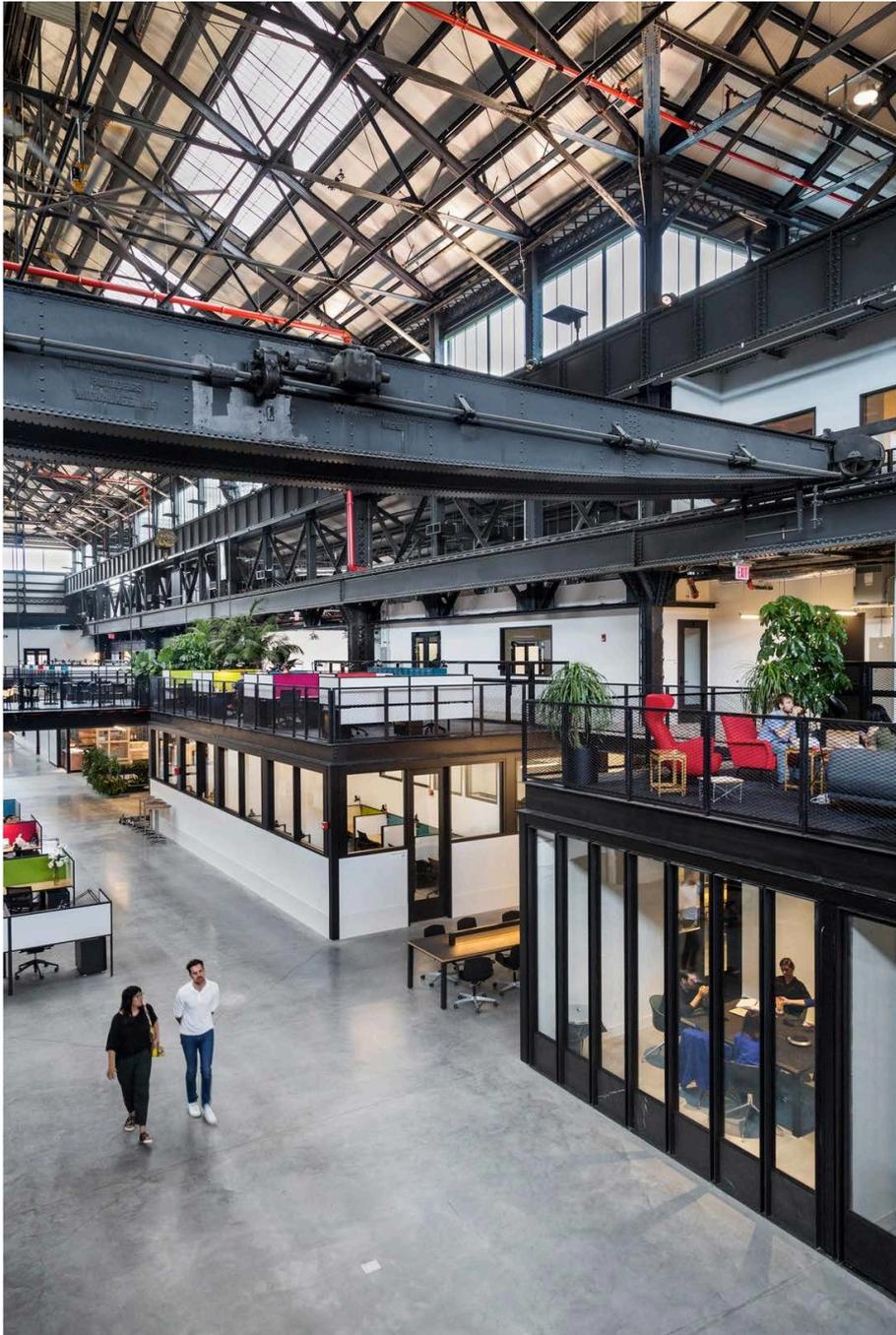


Fig.42 One story stations for closed spaces and open spaces above

The project focuses a lot on flexibility as well. Being a large project, it is important to cater for a wide range of events, users, and needs. Therefore the planning of the spaces was created to provide a variety of seating and working arrangements such as open spaces, private, closed, common, social, and even large conferences. And each with its own different surrounding.



Fig.43 Different Arrangement of Work Spaces

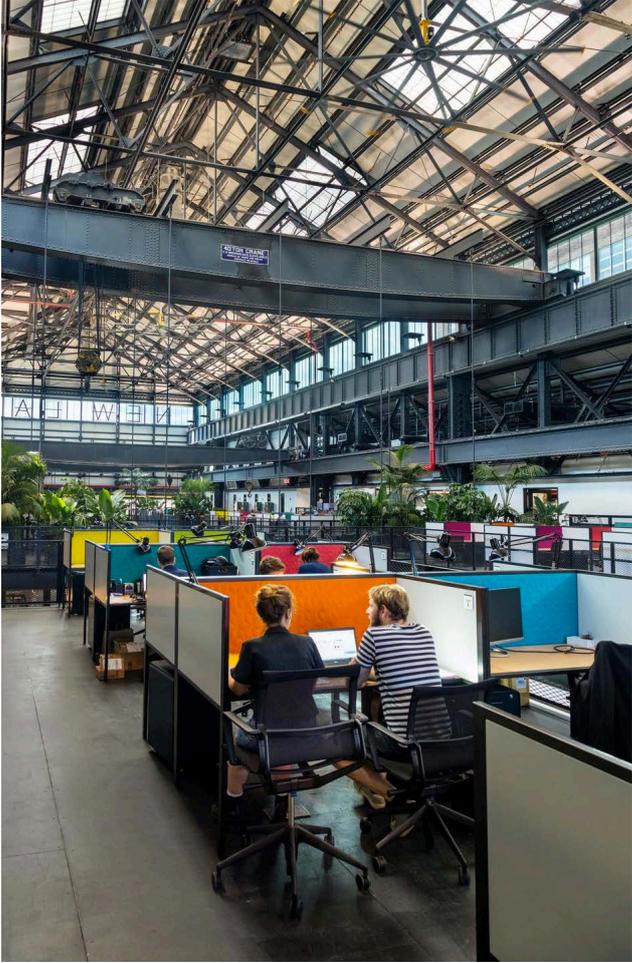


Fig.44 Different Arrangement of Work Spaces



Fig.45 Different Spaces for common and social events

02

COAL DROPS YARD BY HEATHERWICK

London, UK

The studio transformed the site by renovating and connecting the two historic rail structures from the 1850s into a unified and brand-new shopping center. The buildings were quite far apart from each other and making a connection was needed and even helped create the public space in between. Transforming this once industrial and un-inviting place to an interesting and welcoming social point.

Architect: Heatherwick Studio
Location: London, United Kingdom
Program: Retail Commercial Reuse
Project Area: 100,000 sf
Status: Built
Year: 2018



Fig.46 Current Buildings After Renovation



Fig.47 Public Spaces and Cafes between Buildings After Renovation

The original building was built in 1850 as a coal yard for London that is connected to the railways. However it was abandoned in the 1990s and was recently renovated to create a new dynamic spot for the city. There are many nearby universities and schools and the area is now a dynamic and interesting spot for students, families, and people from all around.

BEFORE



Fig.48 Abandoned Buildings before Renovation

AFTER



Fig.49 Project After Renovation



Fig.50 Dynamic Public markets and events

The main goal was to make the industrial and separate complex of buildings transform into one uniform place so people can move freely between the spaces and create a flexible and open public place for the people to enjoy and make use of. In addition to the many retail and cafe shops the project proposed areas both inside and outside for different events and uses

03

MOMA GARDEN - PHILIP JOHNSON, New York City, USA

This sculpture garden opened in 1939 as a public green space for NYC and in 1953 it was redesigned by Philip Johnson for the museum of modern art to house different sculptures, events, and exhibitions. The special aspect of this garden is its unique design that allows the same garden to house many different events perfectly and comfortably with maximum adaptability and flexibility. While still being aesthetically pleasing and welcoming.

Architect: Philip Johnson
Location: New York City, USA
Program: Cultural Public Garden
Project Area: 40,000 sf
Status: Built
Year: 1953



Fig.51 Reading and Relaxation areas in the Garden



Fig.52 Water, Greenery, and Marble define main areas of the Garden

This hidden garden has way more functions than just an ordinary garden. It is designed first of all to be a hidden retreat and relaxing place from the busy city life and crowded streets of new york, just like a secret jungle. However, this little jungle is capable of housing art exhibitions, reading clubs, workshops, conferences, and even small concerts and shows. Even the circulation and planning of this garden creates boundaries that are set by a mixture of slopes and vegetation. Creating interesting pathways and nodes throughout the site.



Fig.53 Art and Relaxation areas in the Summer

In addition to its different functions and flexibility, due to the suitable choice of materials and plants this garden is inhabited all year long and in all seasons. The secluded design of this garden makes it comfortable both in the summer and winter. During winter the garden walls and the plants block harsh winds, and in the summer the summer plants provide shade while the water bodies provide some cooling effect and winds over the white marble paving.

As for the trees and vegetation implemented in this garden, they were specifically chosen to aid with the goals of the design and the space. Therefore it is clear that different seasonal plants were used so the garden is flourishing in both winter and summer. In the center of the garden Weeping Beech Trees are used as a semi-permeable barrier. While on the east and west sides White Spire asian birch trees are planted. English Ivy was also planted in all planting beds to give the green carpet effect. Along with seasonal flowers that decorate different times of the year.

DIFFERENT FUNCTIONS IN ALL SEASONS

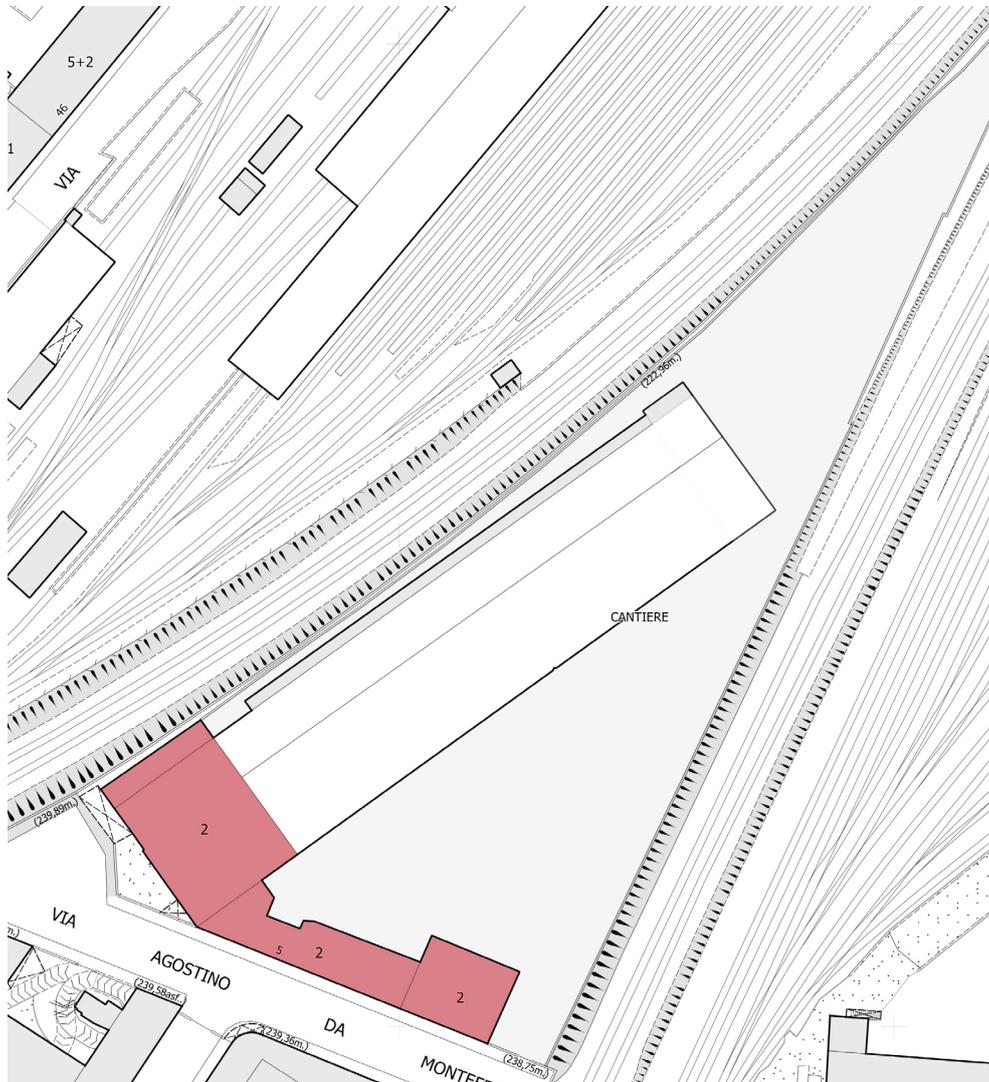
Oasis in the City
Quiet Haven from City noises
Sculpture Garden
Reading Areas
Outdoor workspaces
Sheltered Outdoor Summer Garden
Spaces for Performances and shows
Public and Social Activities



Fig.54 Flowers, Trees and vegetation in the Colder seasons

DESIGN PROPOSAL

DEMOLITIONS



 Parts To be Demolished

REASONING

Make the site more **welcoming**

Improve **entrance** to the Site - easier access

Re-join and **connect** abandoned parts from site

Improve **circulation** throughout the site

No more isolated corners

More potential for visual and physical **connectivity**

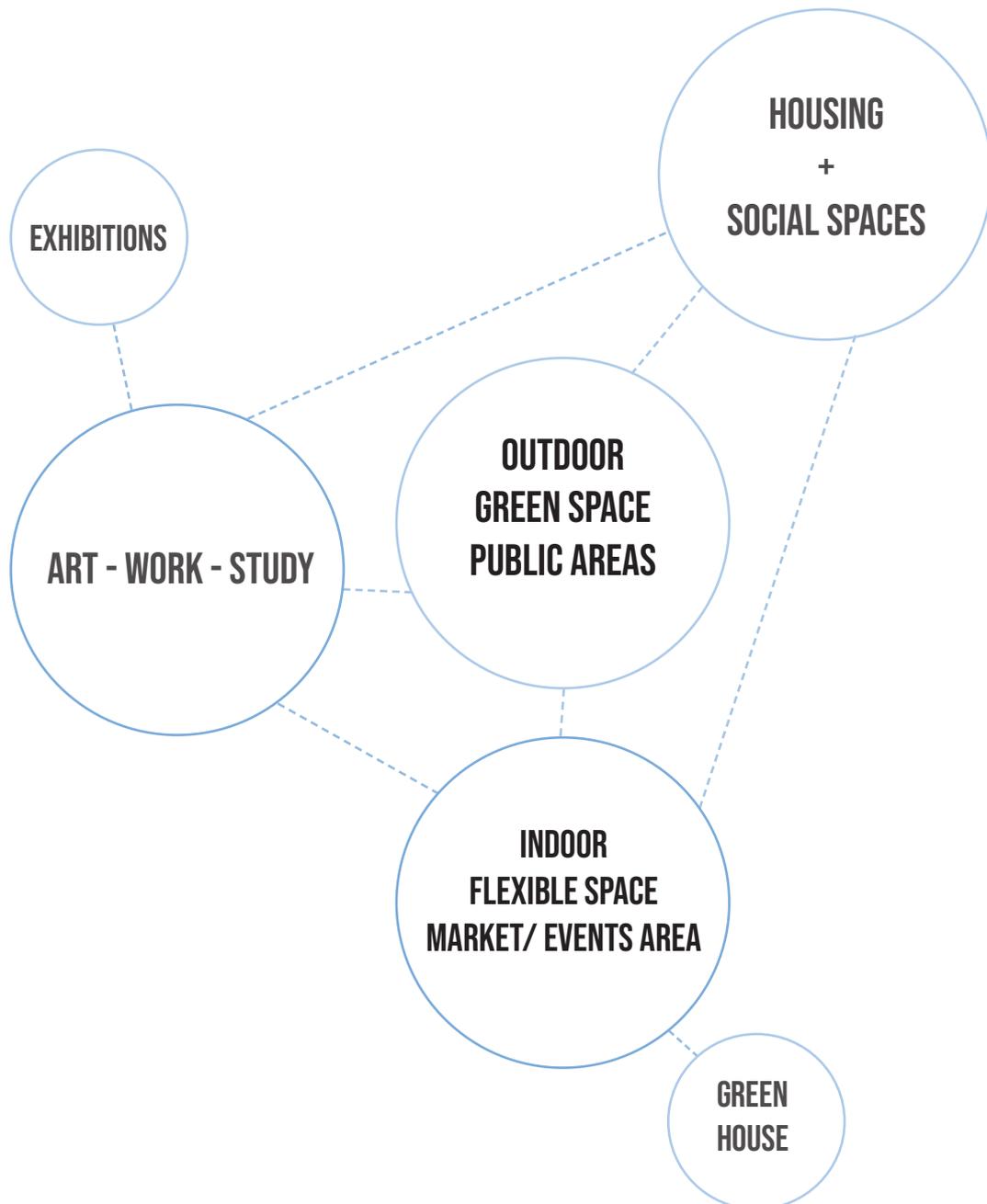
DESIGN CONCEPTS AND GOALS

- Improve **aesthetics** of area
- Increase **greenery**
- create a **barrier** from surroundings
- create a protected and calm **retreat**
- merge sustainable strategies into the **design**
- provide both public and private **spaces**
- Propose **functions** that provide to the **community** and to the project
- Create an attractive and **pleasant** area
- **Revive** the area with suitable functions

DESIGN CONCEPTS AND GOALS

Bubble Diagram of Site

Different Arrangements of Functions



STRATEGIES AND CONCEPTS

1. The current site is divided by two main **visual and physical axis** that will act as the strong starting point of our design proposal around the current industrial building.

2. Creating a visual and sound barrier through the use of greenery on the sides of the site close to the railways.

3. Allocation of new different buildings and functions along the site and the axis in the **appropriate** manner. Within the boundaries of the green barrier so they are protected and surrounding by green and welcoming spaces.

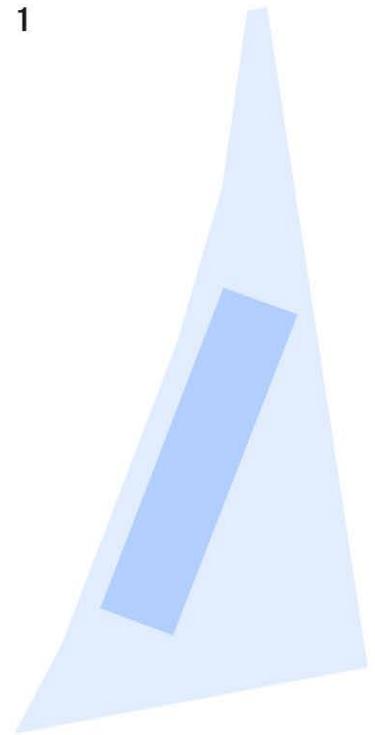
4. More greenery, parks, and public gardens are added in between the buildings, the circulation paths, and public open spaces. Also the placing of greenery on the east and south facing facades of the industrial building. This will aid in the shading and cooling of the building during hot months especially where there is large glass openings. Moreover, the greenery gives the users the feeling of entering through a calm and **protected jungle** that protects the area from surrounding railways and street noises.

5. The addition of more paths and public spaces in between the old and new buildings along with public green spaces, creating a public piazza or square in the middle of the site.

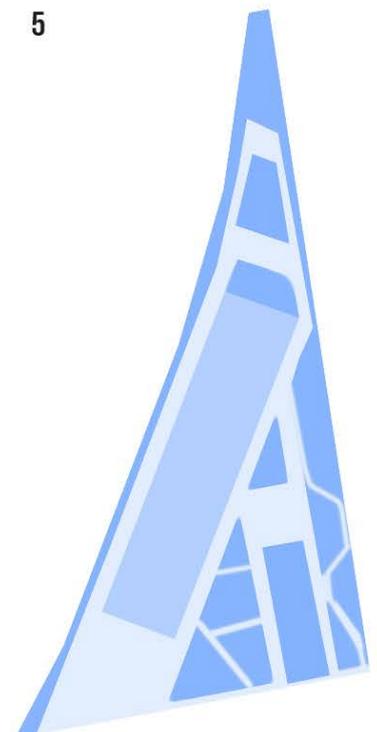
6. A solid and void diagram to understand the movement and dynamic of the proposal between built and unbuilt spaces.

7. Outlining the main axis and connection paths of the site both for pedestrian and cycling.

8. The final outcome is then realised by combining the strategies above in harmony.

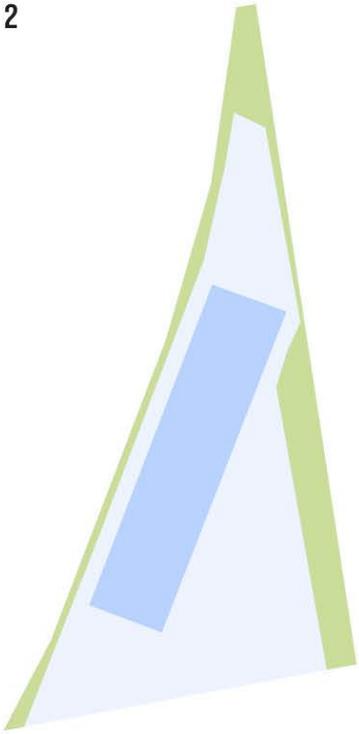


CURRENT SITE



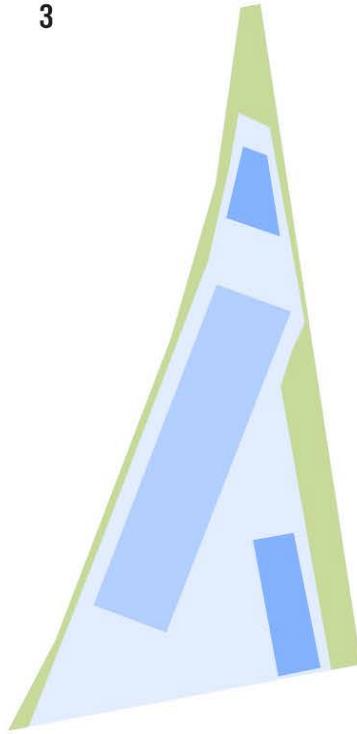
PATHS AND PUBLIC SPACES

2



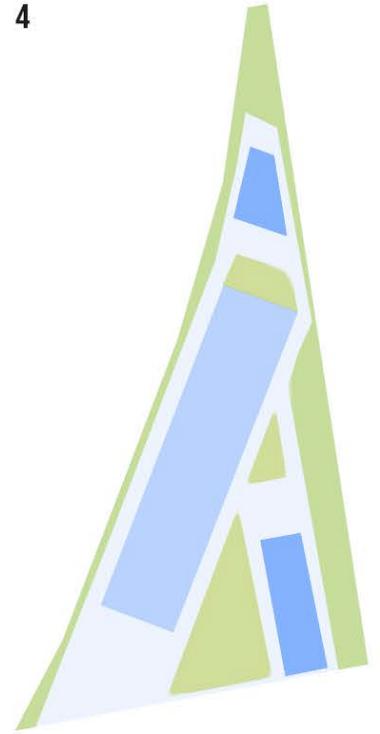
GREEN BARRIER

3



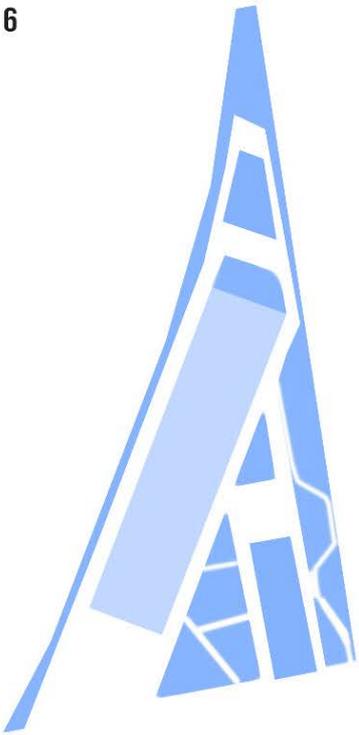
NEW BUILDINGS

4



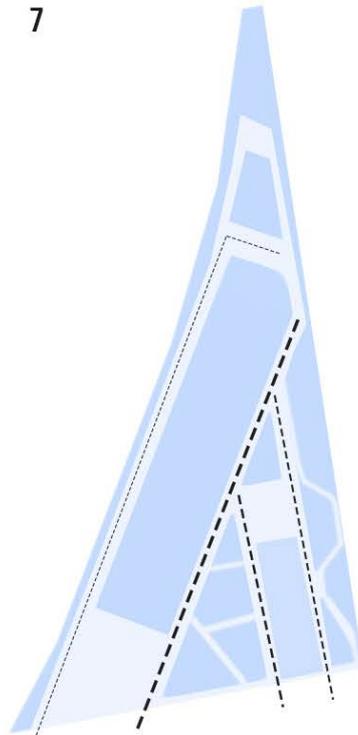
GREEN SPACES

6



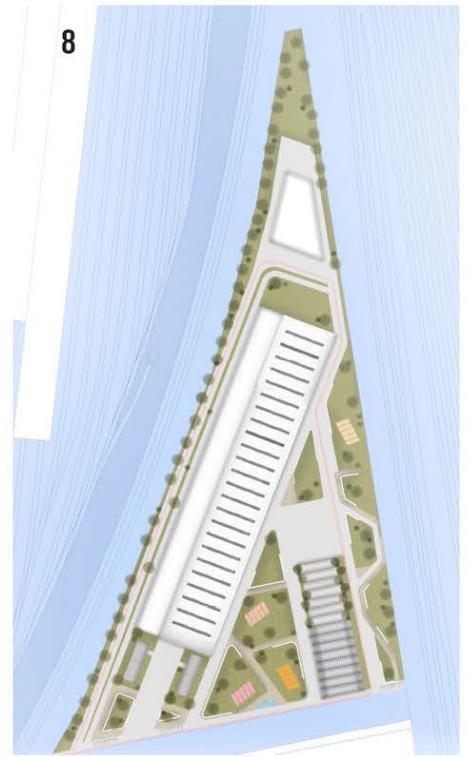
SOLIDS AND VOIDS

7



CIRCULATION AND PEDESTRIAN PATHS

8



FINAL OUTCOME

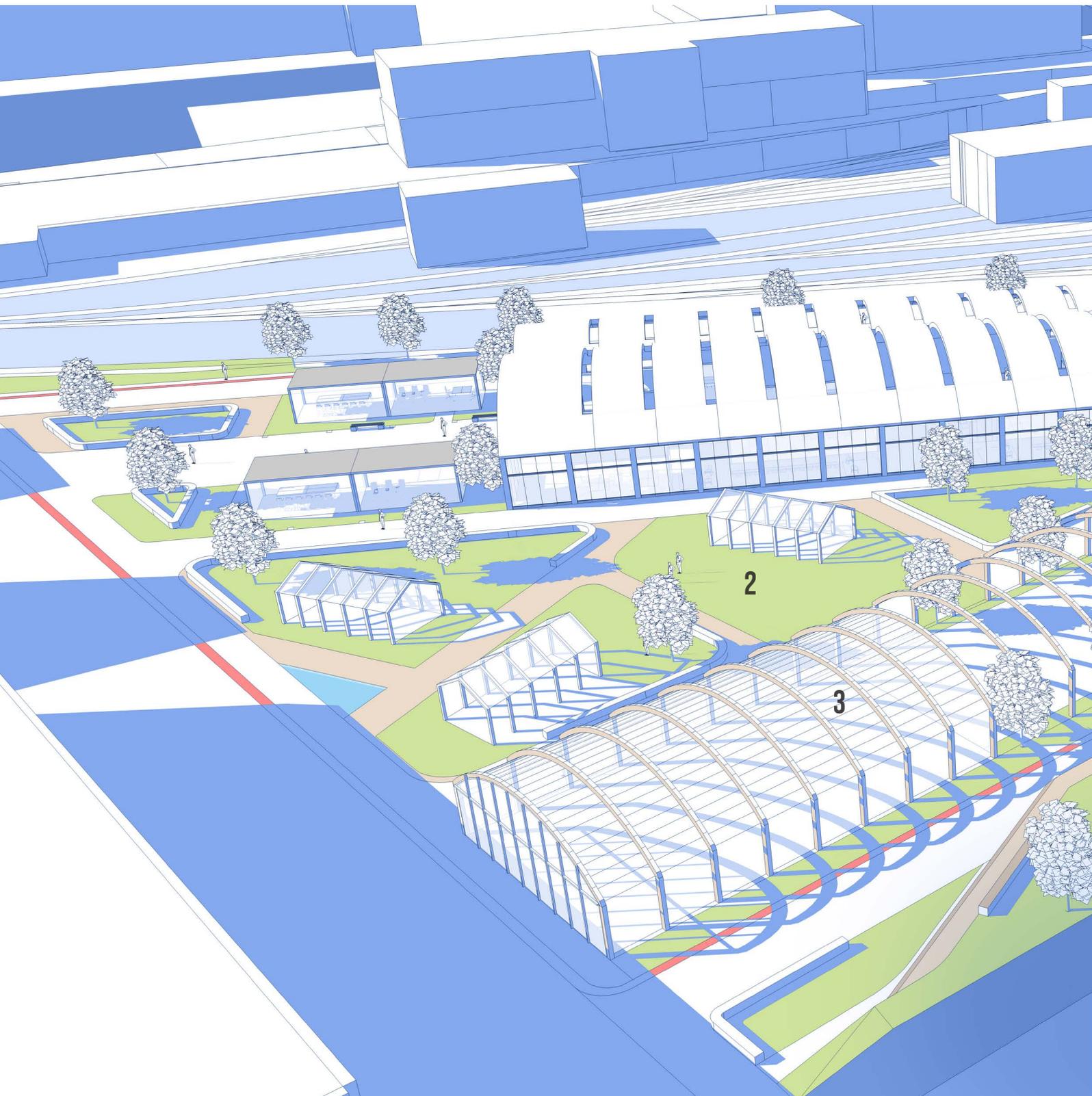
MASTERPLAN SCHEME

1 Art, Study, Work Spaces

Different spaces that can be used for arts, working, and studying. In addition to spaces for workshops, events, or conferences.

2 Flexible Outdoor Space

Community outdoor spaces for planting, events, social activities, and creative workshops and markets.

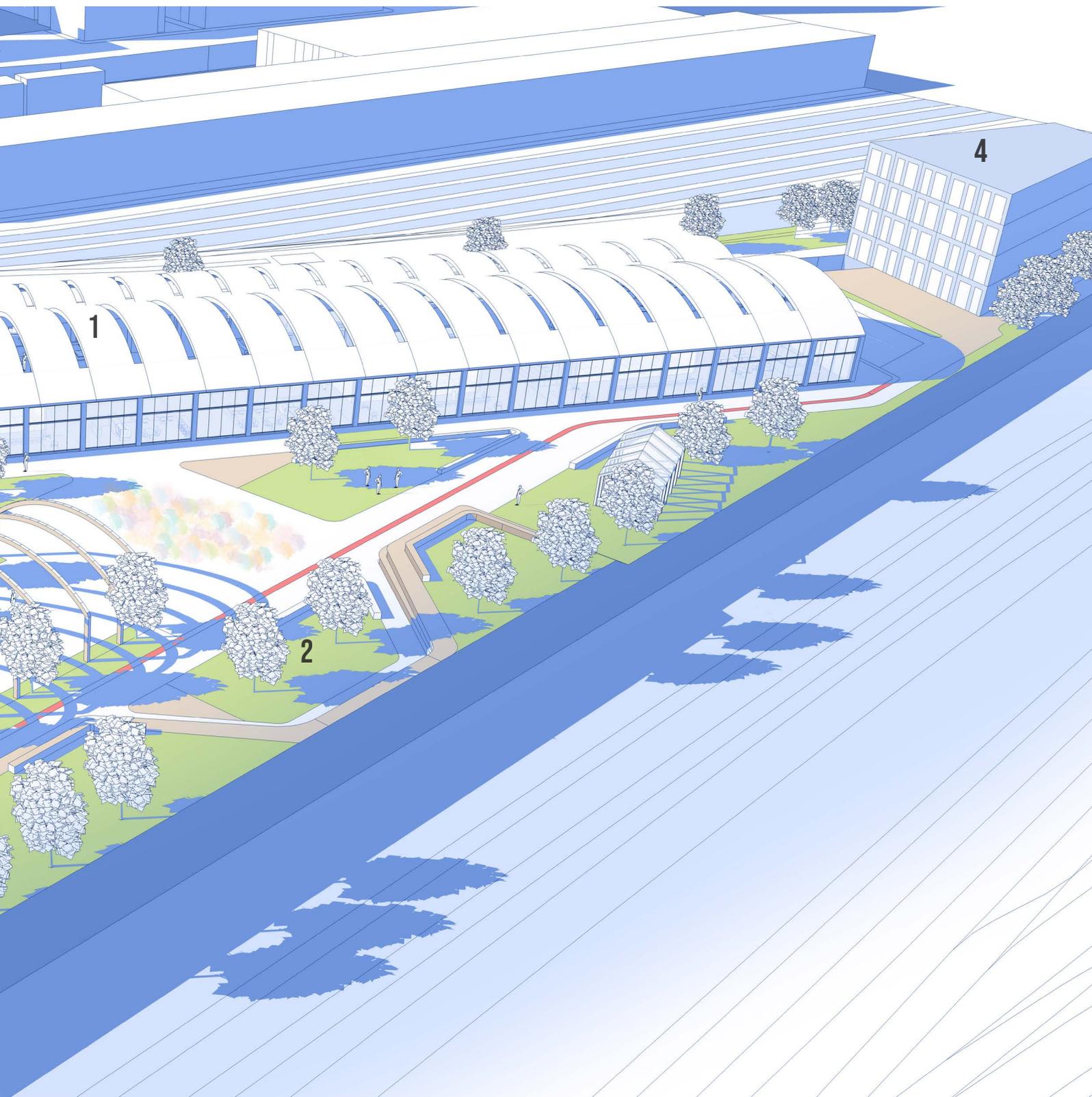


3 Flexible Covered Space

Covered semi-permeable area for markets, events and greenhouse for planting.

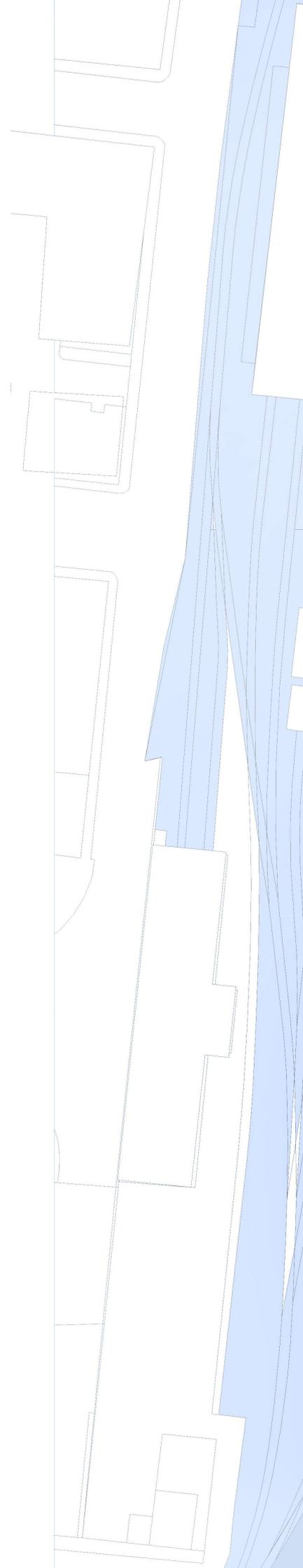
4 Accommodation Building

Accommodation with underground parking and social spaces.



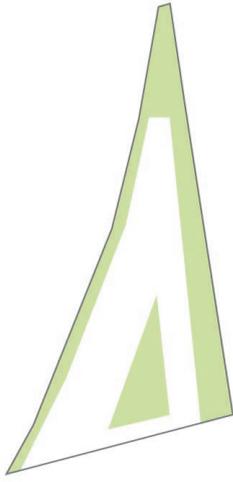
MASTERPLAN: DESIGN PROPOSAL

- 1 **Art, Study, Work Spaces**
Different spaces that can be used for arts, working, and studying. In addition to spaces for workshops, events, or conferences.
- 2 **Community Art Center**
For workshops, teaching arts and crafts for children and adults
- 3 **Bike Path + Parking**
Along a cycling lane path.
- 4 **Outdoor Covered Spaces**
Flexible spaces for semi-outdoor gatherings, events, food stalls, and shop stands
- 5 **Outdoor Seating Areas**
Different benches, fields, and seats for relaxing and resting in the outdoors surrounded by greenery
- 6 **Accommodation Buildings**
A mixture of public and private spaces for users and residents of this area.
- 7 **Creative Space**
Semi-covered flexible spaces that work best for events, music concerts and performing arts
- 8 **Green House + Covered Space**
Flexible space for food markets and other kinds of markets and a green house.
- 9 **Water Pond**
For more pleasant seating areas and cooling effect
- 10 **Public Square/ Piazza**
For more social and public gatherings and events.
- 11 **Service Road**
For access to the underground parking and services.

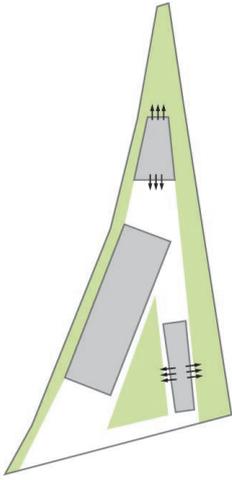




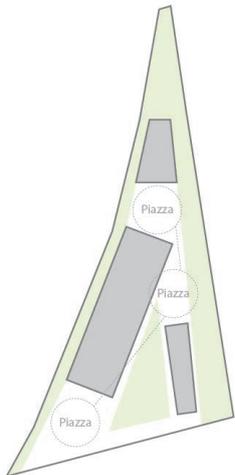
MASTERPLAN: DESIGN LEGEND



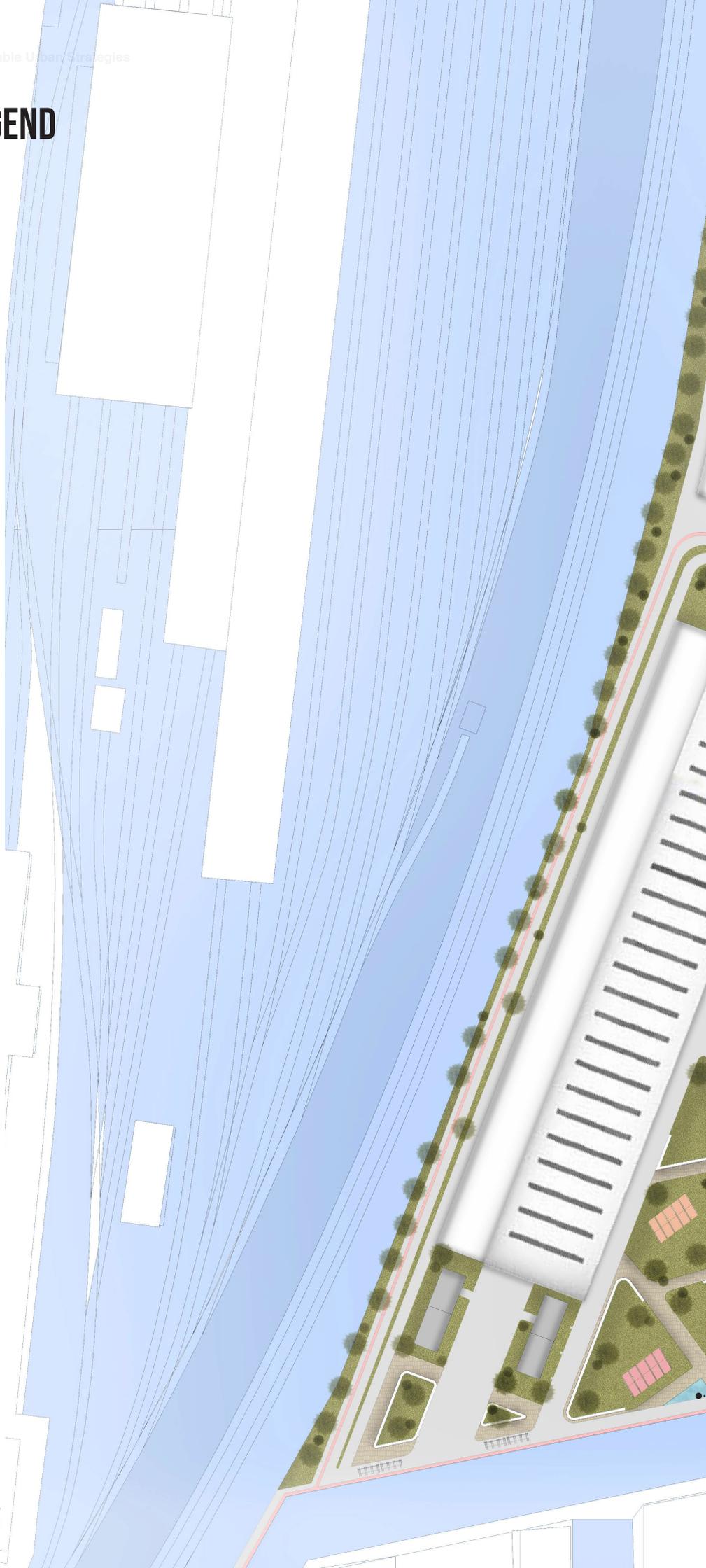
1. Greenery as Protective Barrier from the railways

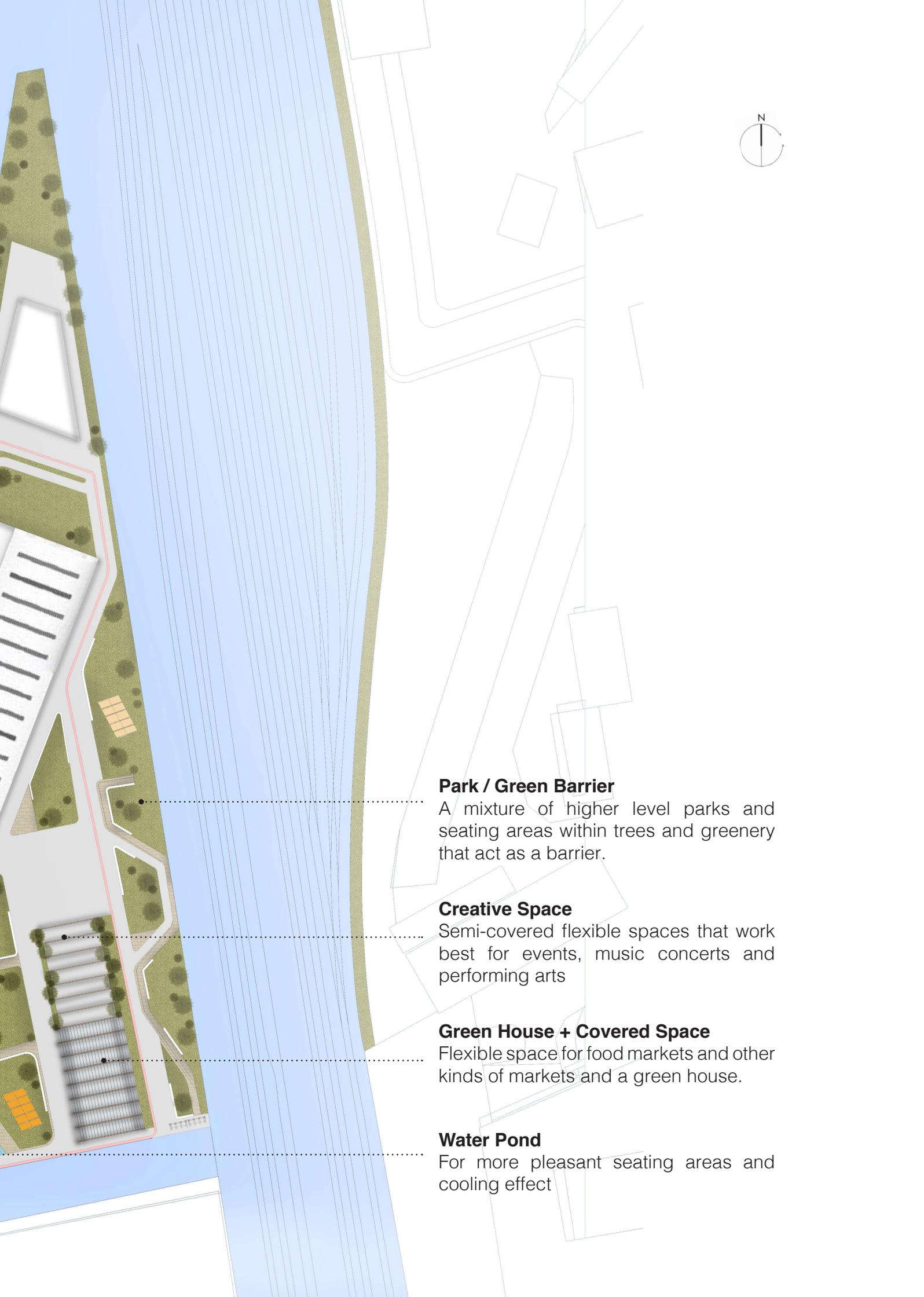


2. Greenery as a surrounding view for the buildings + Interactive dynamic social spaces



3. Public piazzas for events and social events





Park / Green Barrier

A mixture of higher level parks and seating areas within trees and greenery that act as a barrier.

Creative Space

Semi-covered flexible spaces that work best for events, music concerts and performing arts

Green House + Covered Space

Flexible space for food markets and other kinds of markets and a green house.

Water Pond

For more pleasant seating areas and cooling effect

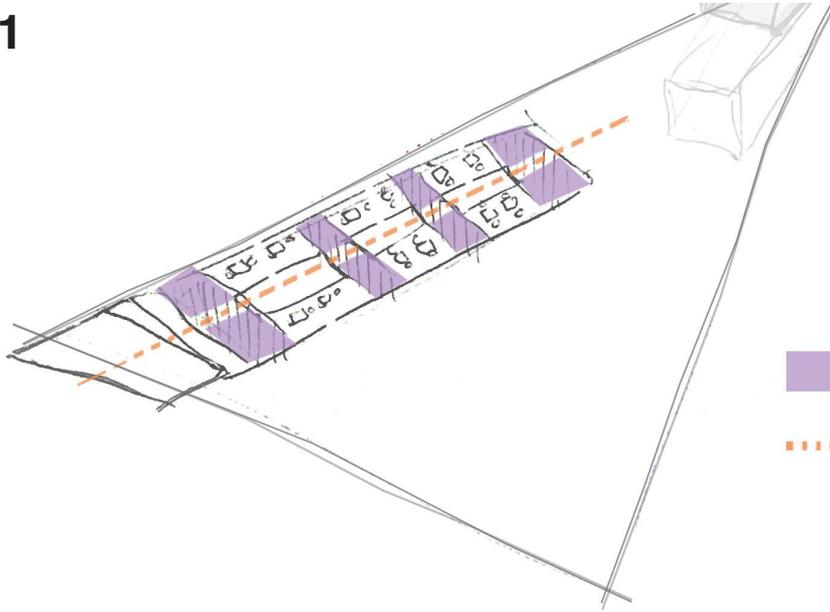
INDUSTRIAL BUILDING : IDEA CONCEPT

As for the concept of adaptive architecture for our case here we chose to preserve the **exoskeleton that is also the key point of re-using**, and the main visual presence. A dialogue with the site and surroundings. Yet renewing the heart of this building to allow a more relevant and sensible solution instead of its abandoned state that is based on contemporary uses and user-friendly layout.

The solution is to be long lasting and **up to date with the current needs** and requirements of our current day in terms of layout, functions, circulation, and environmentally. By making use of what is already available.

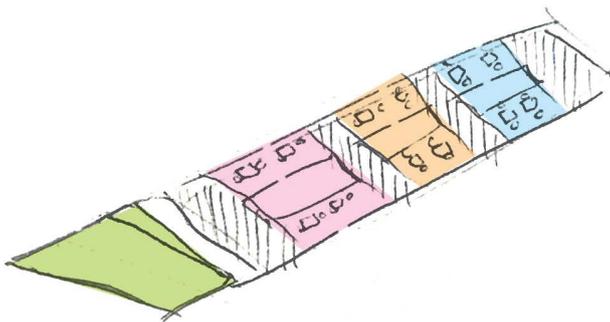
For preserving the exterior of the industrial building and being more efficient we came up with the proposal of incorporating the **Island Concepts** to the building. That is by creating a separate structures (islands) for each function **art, study, and work**. These separate masses will be of two floors and located in the center of the building as it is the area with the highest ceilings due to the arched roof. Allowing proper circulation around these spaces and throughout the building.

1



-  Circulation + Social Spaces
-  Main Axis

2

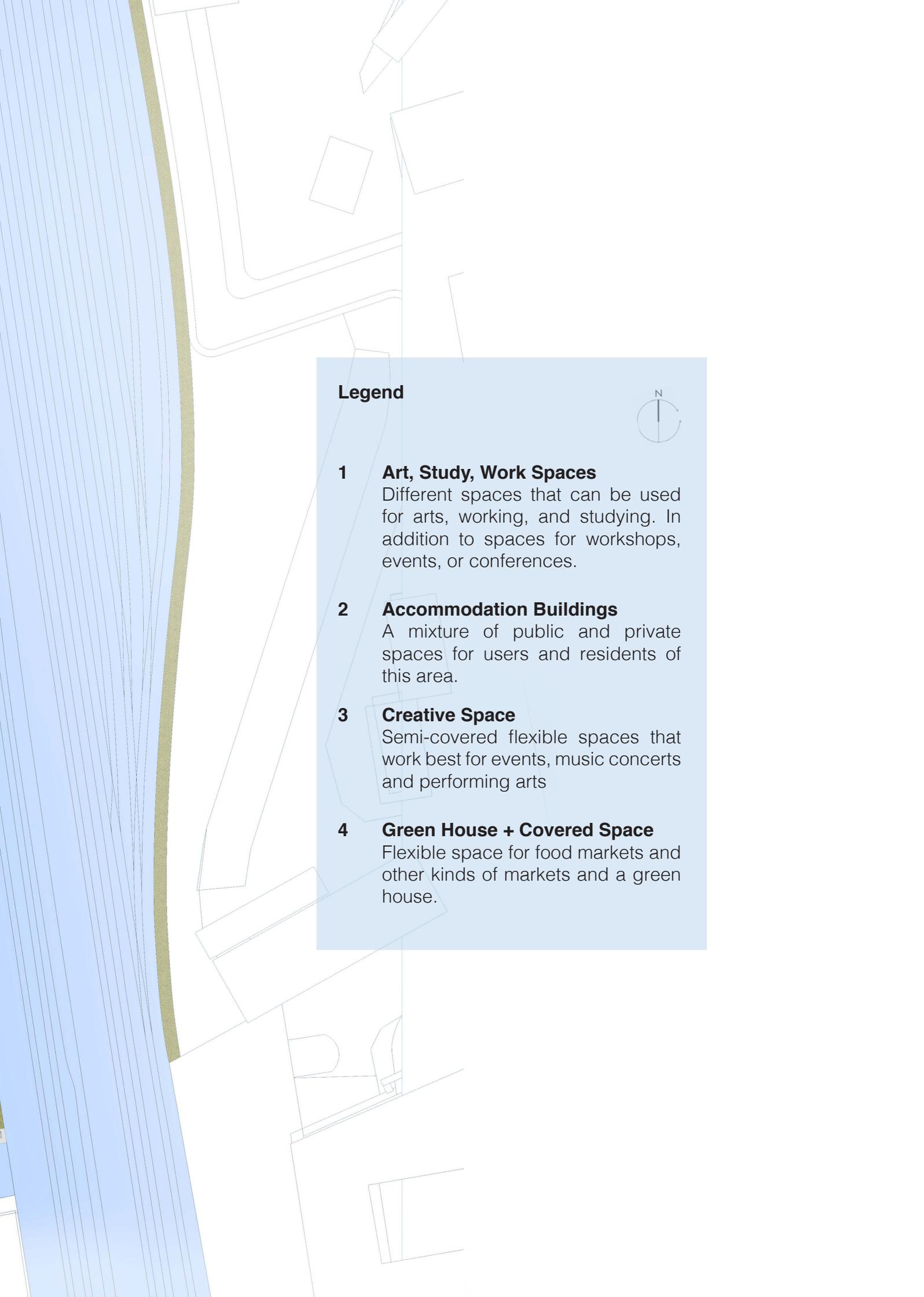


-  Greenery
-  Art & Design Workshops
-  Study Area / Library
-  Co-working Offices

MASTERPLAN

Ground Floor Plan





Legend

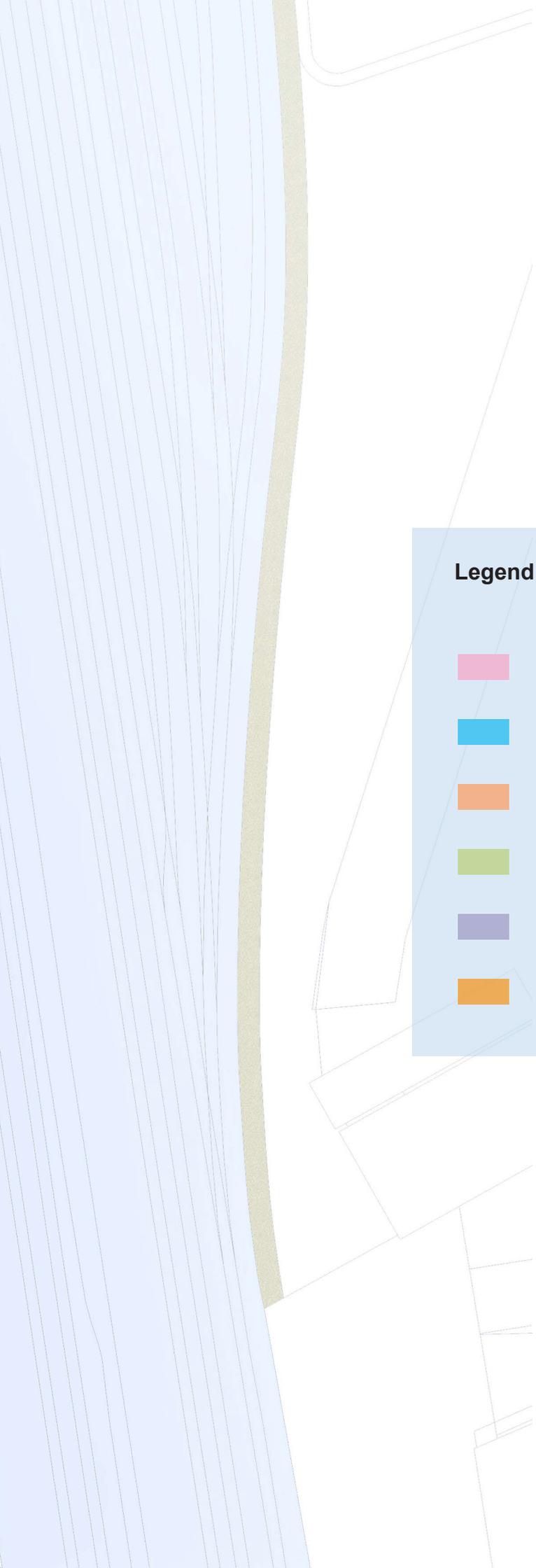


- 1 Art, Study, Work Spaces**
Different spaces that can be used for arts, working, and studying. In addition to spaces for workshops, events, or conferences.
- 2 Accommodation Buildings**
A mixture of public and private spaces for users and residents of this area.
- 3 Creative Space**
Semi-covered flexible spaces that work best for events, music concerts and performing arts
- 4 Green House + Covered Space**
Flexible space for food markets and other kinds of markets and a green house.

INDUSTRIAL BUILDING

Zoning - Different Arrangements of Functions





Legend:

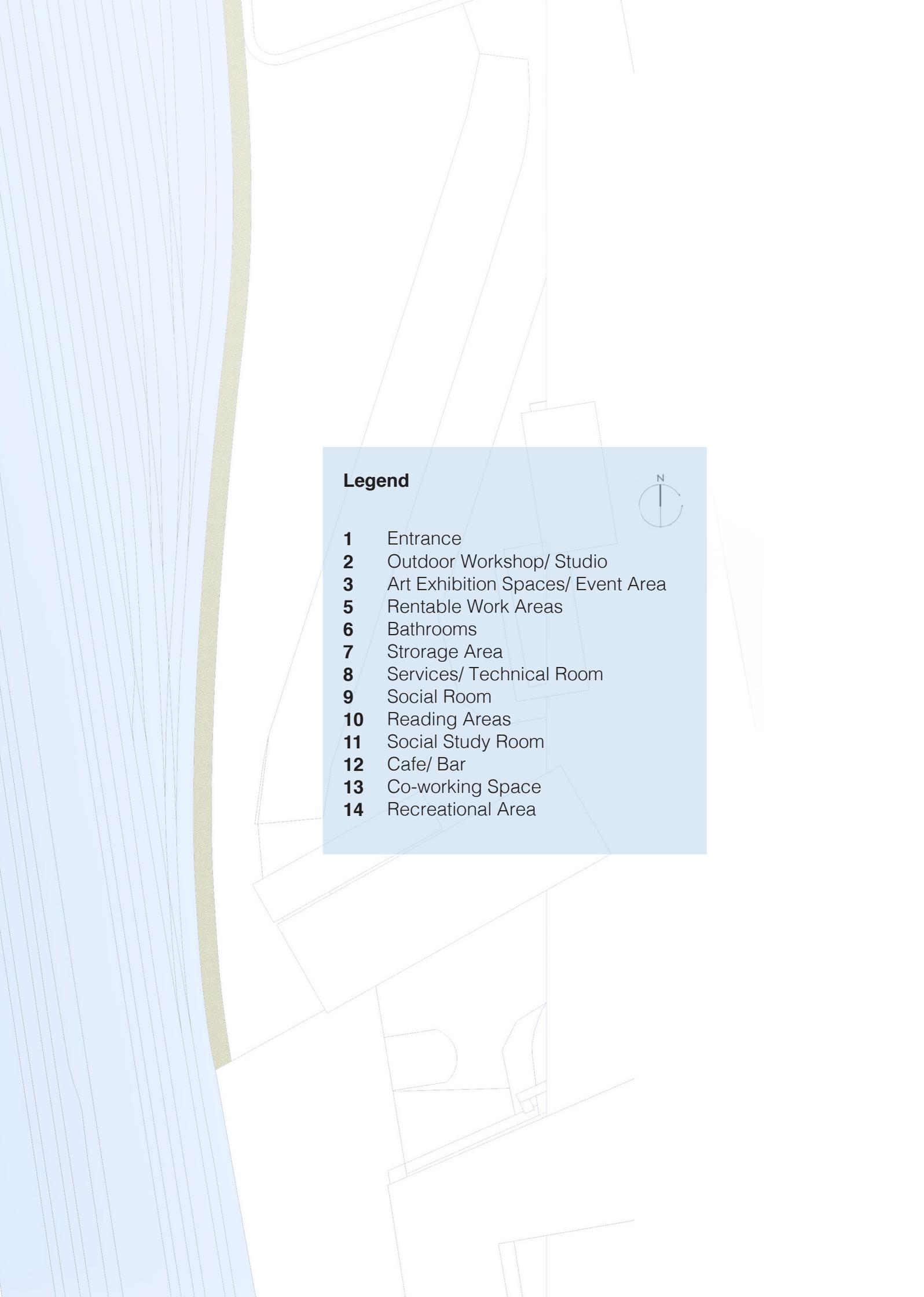


-  Art
-  Study
-  Work
-  Circulation
-  Social
-  Services

INDUSTRIAL BUILDING

Industrial Building Ground Floor

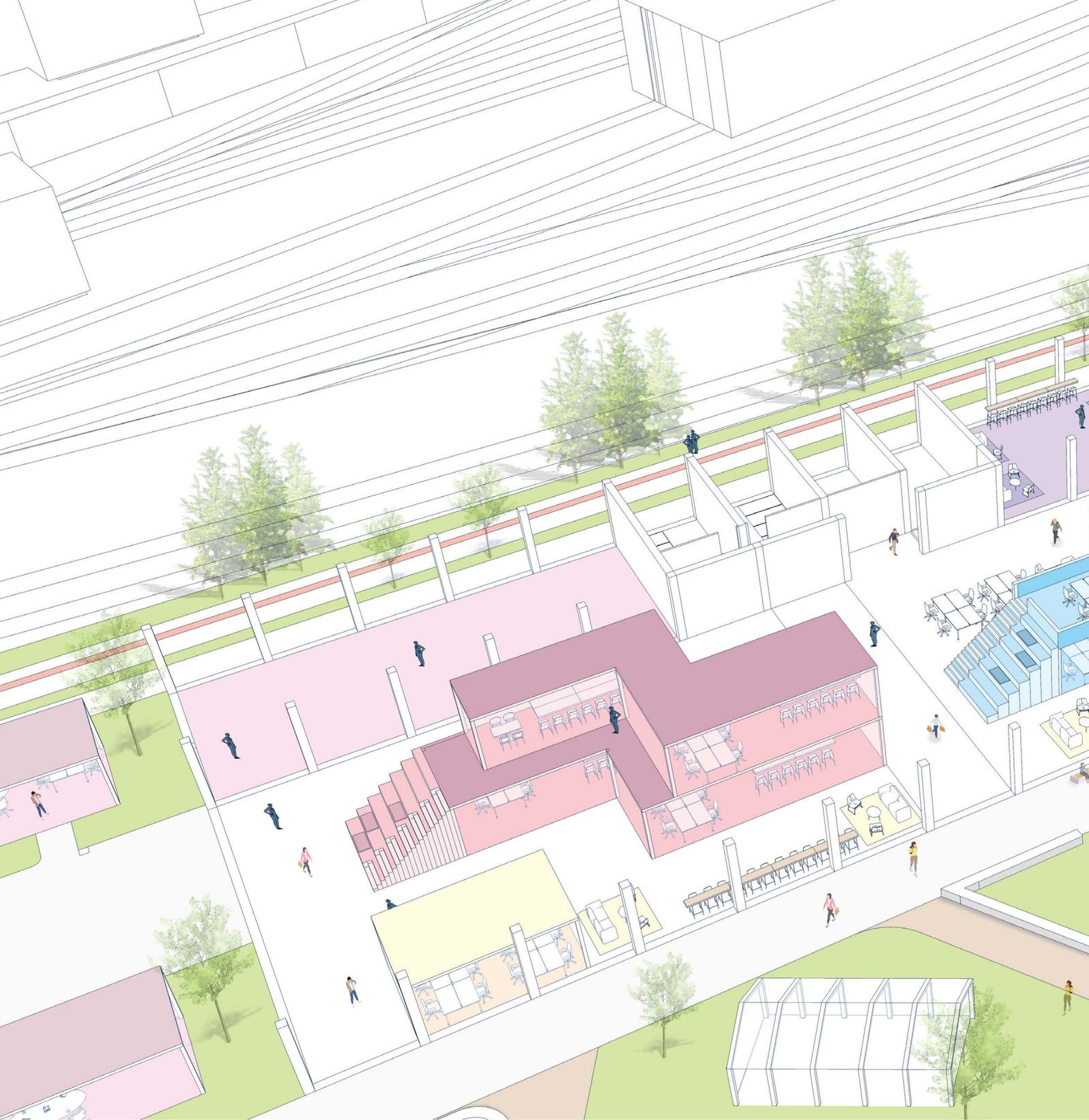




Legend



- 1** Entrance
- 2** Outdoor Workshop/ Studio
- 3** Art Exhibition Spaces/ Event Area
- 5** Rentable Work Areas
- 6** Bathrooms
- 7** Storage Area
- 8** Services/ Technical Room
- 9** Social Room
- 10** Reading Areas
- 11** Social Study Room
- 12** Cafe/ Bar
- 13** Co-working Space
- 14** Recreational Area



MASTERPLAN - INDUSTRIAL BUILDING SECTIONAL PERSPECTIVE (ISLANDS)

Building new proposal Program



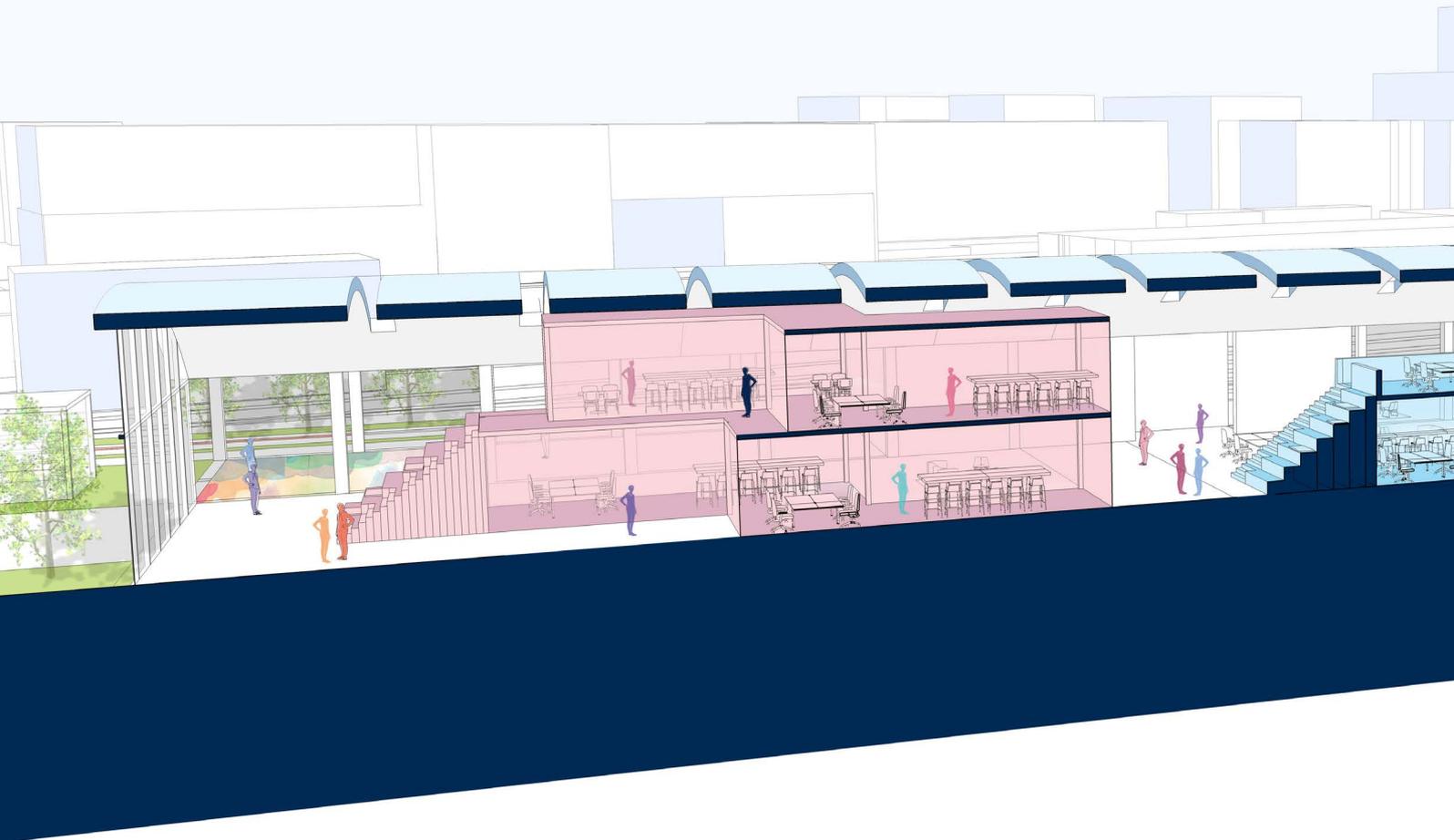
Legend:

 Art

 Study

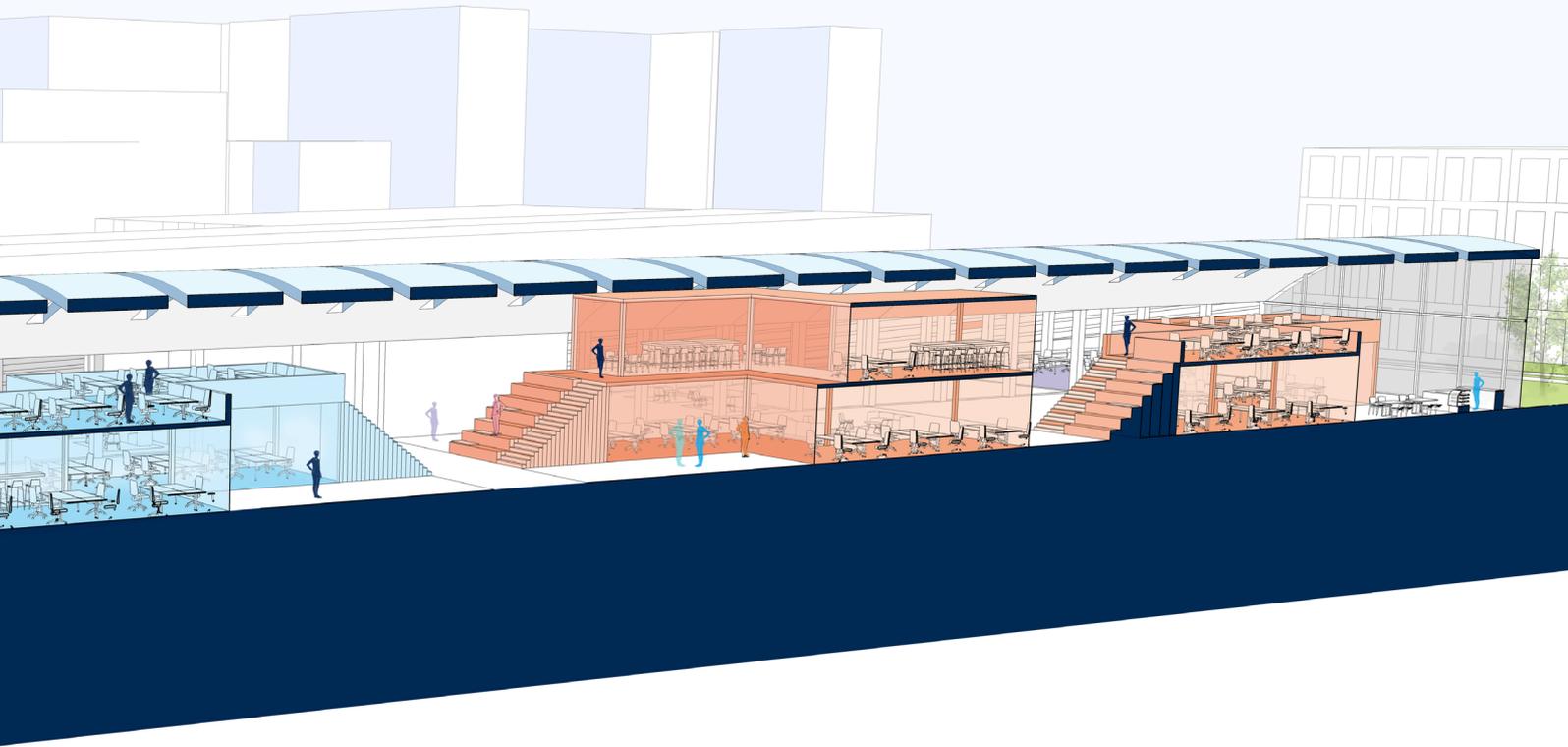
 Work

 Social



INDUSTRIAL BUILDING SECTIONAL PERSPECTIVE (LONG)

Different Arrangements of Functions



Legend:



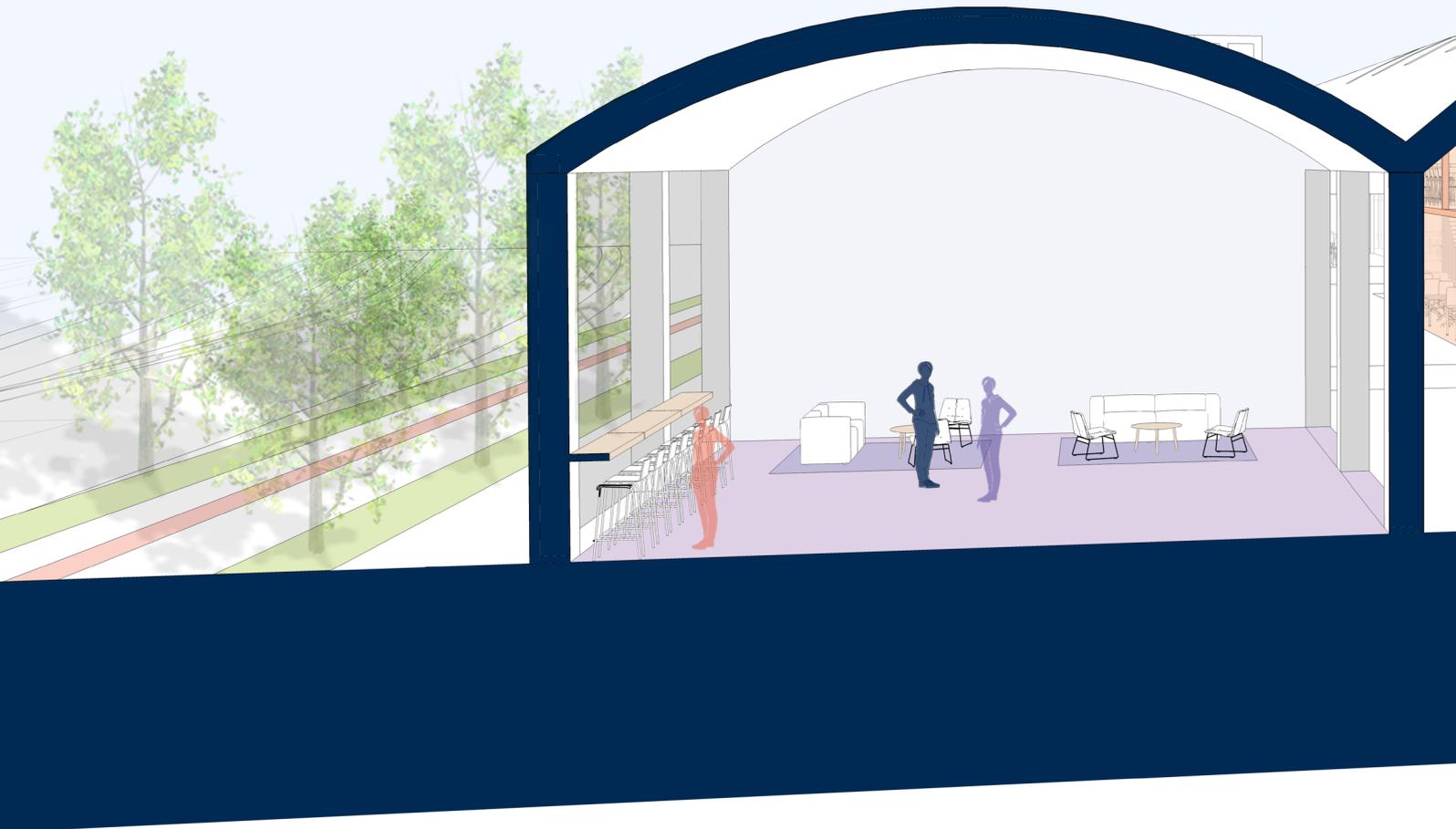
Art



Study

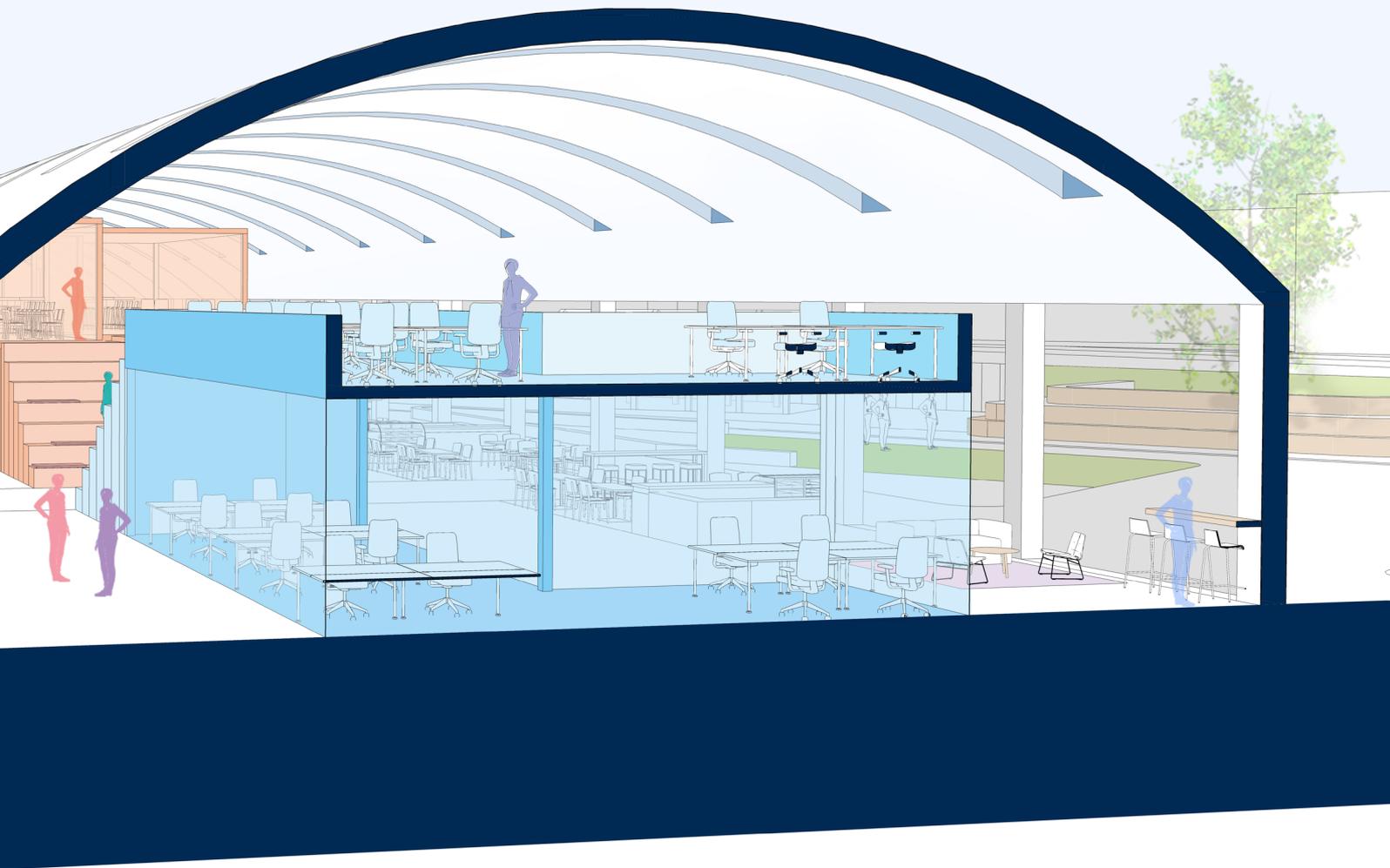


Work



INDUSTRIAL BUILDING SECTIONAL PERSPECTIVE (SHORT)

Different Arrangements of Functions



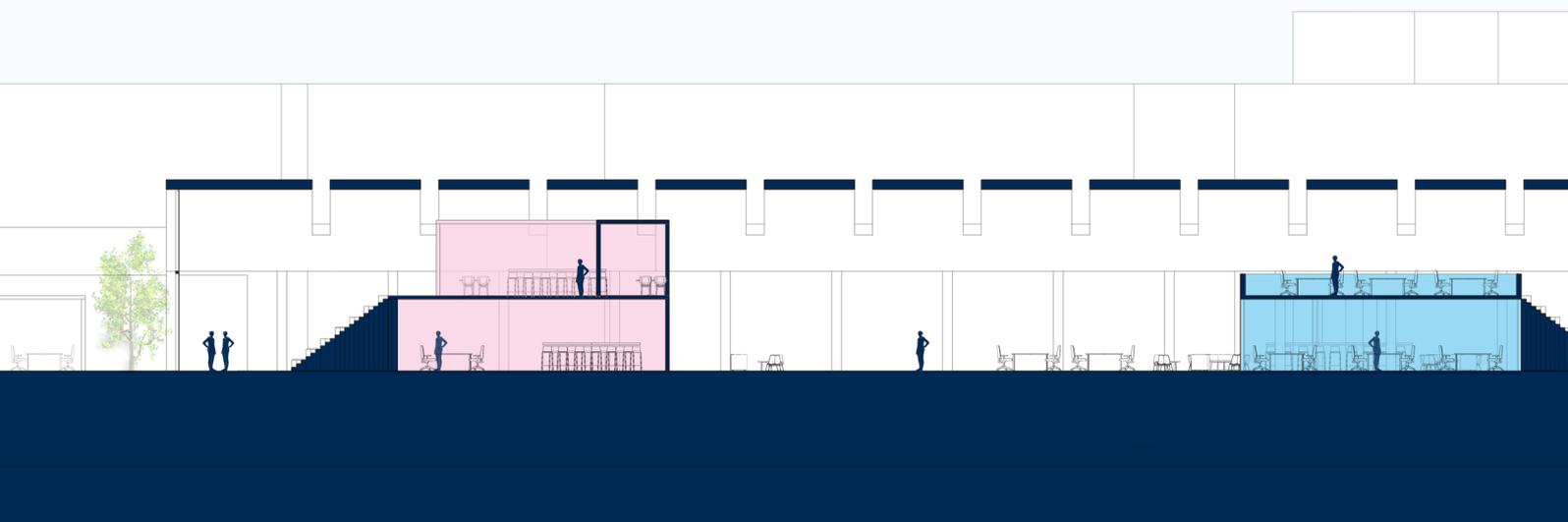
Social



Study

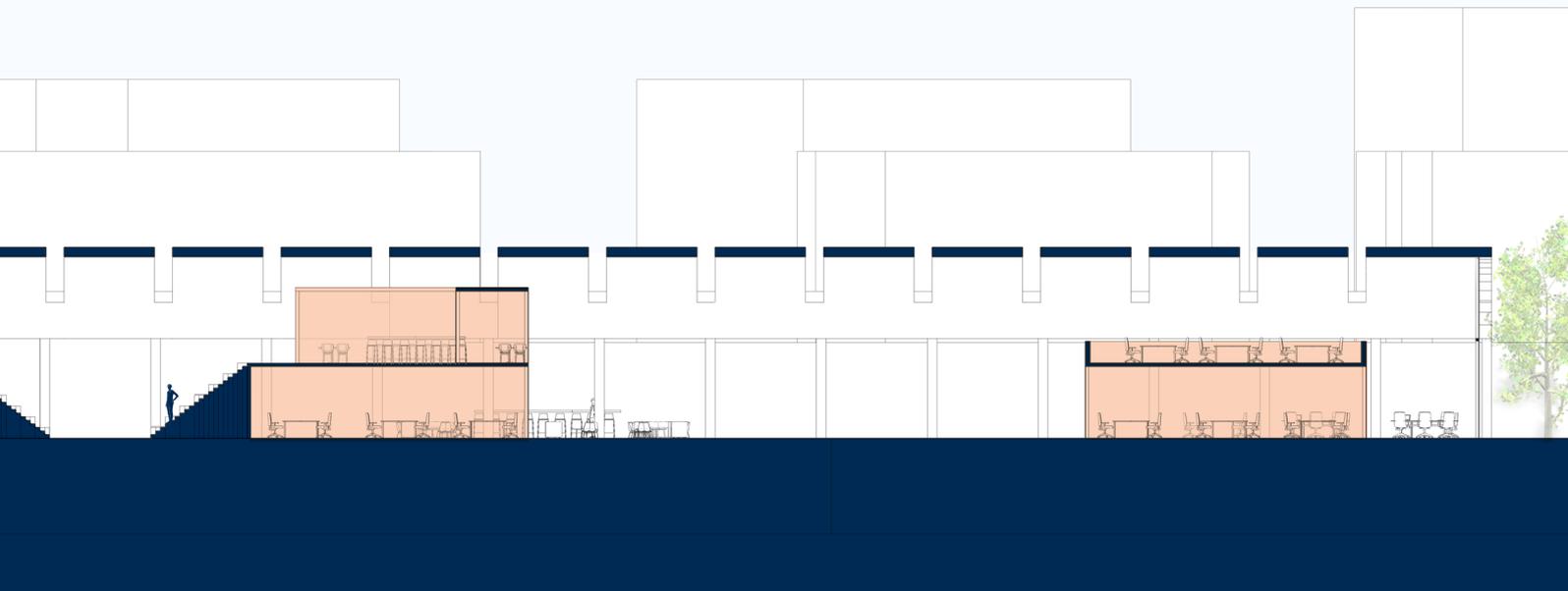


Work



INDUSTRIAL BUILDING SECTION (LONG)

Different Arrangements of Functions



Legend:



Art



Study



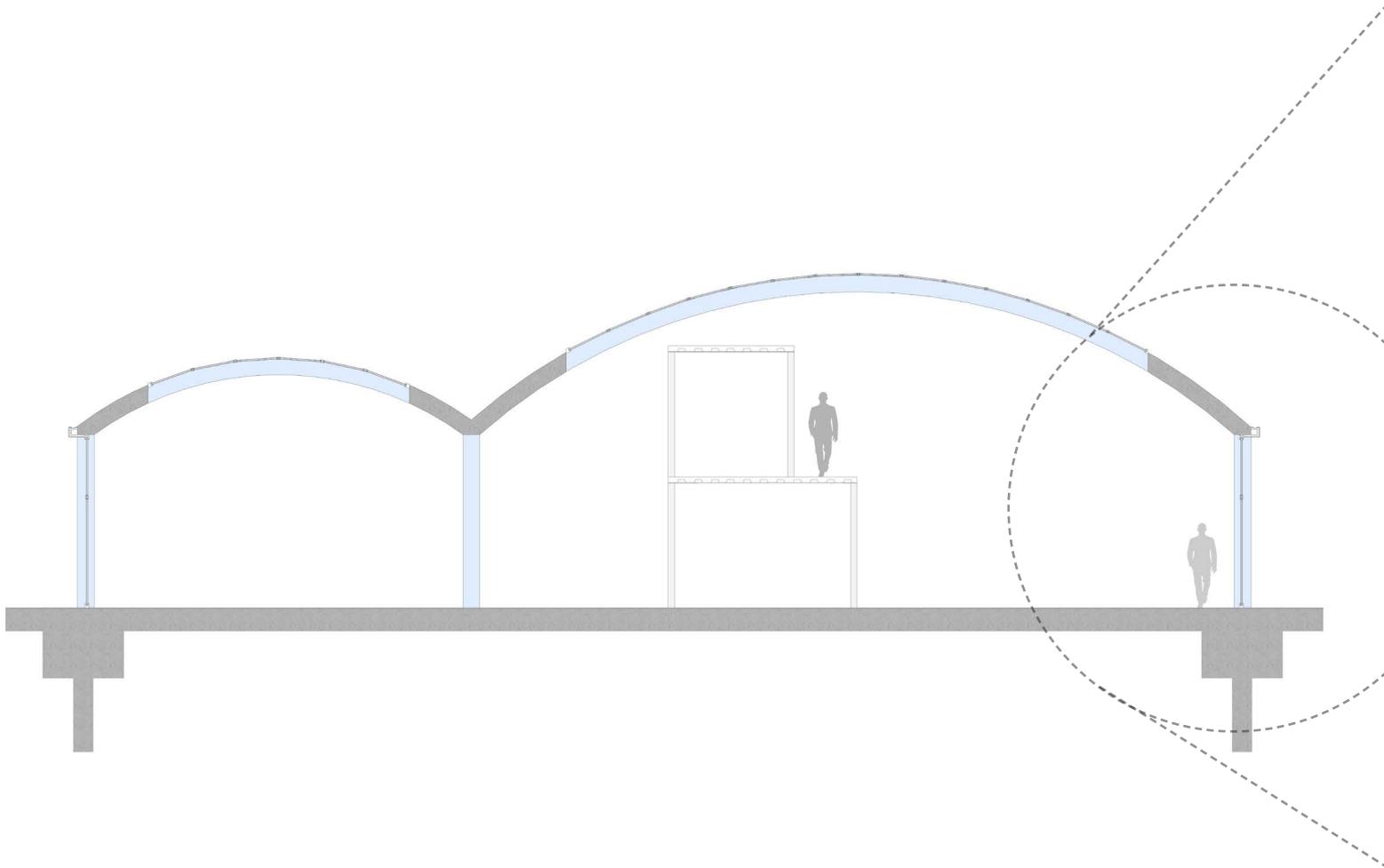
Work



INDUSTRIAL BUILDING SECTION (SHORT)

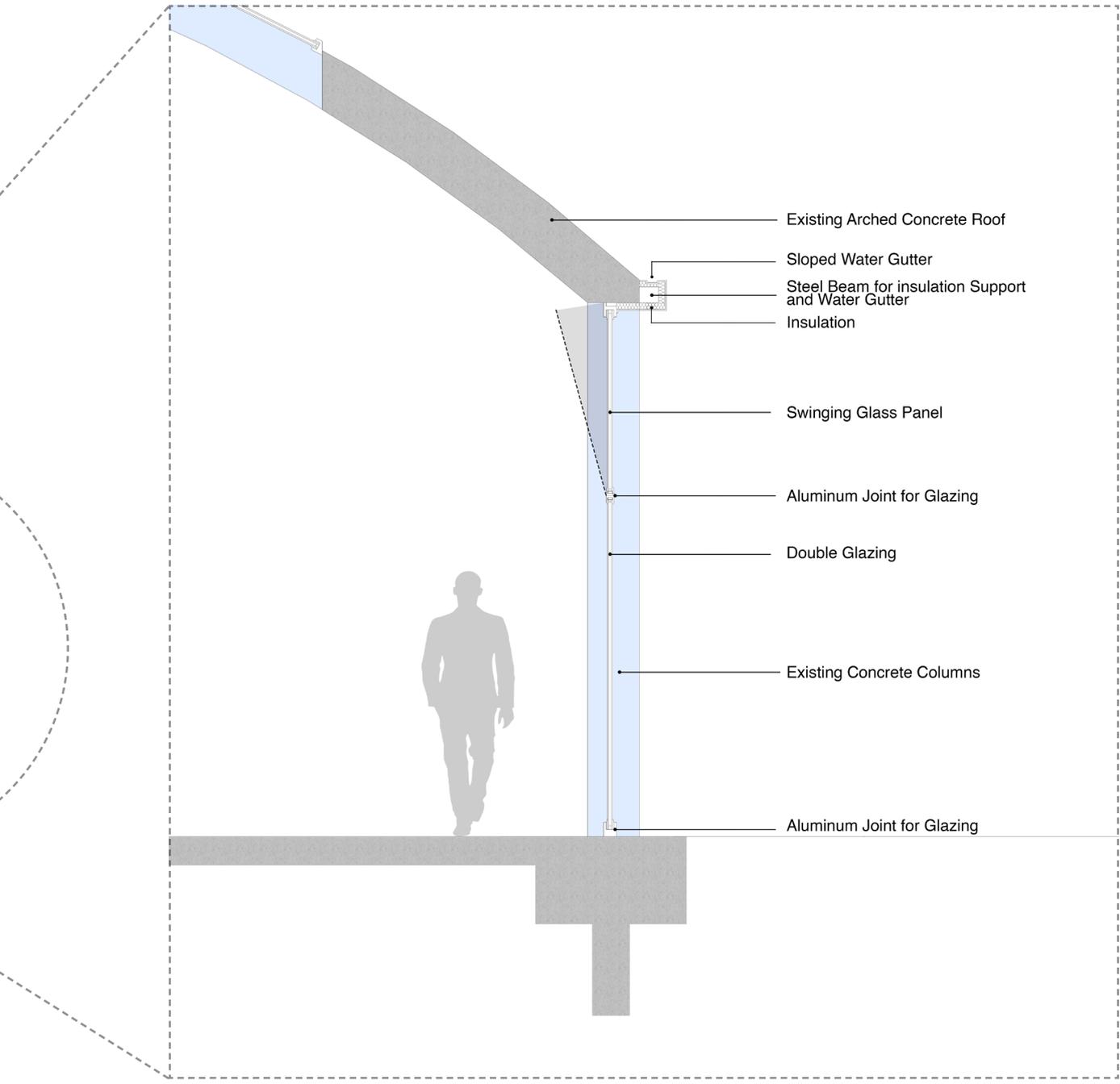
Different Arrangements of Functions





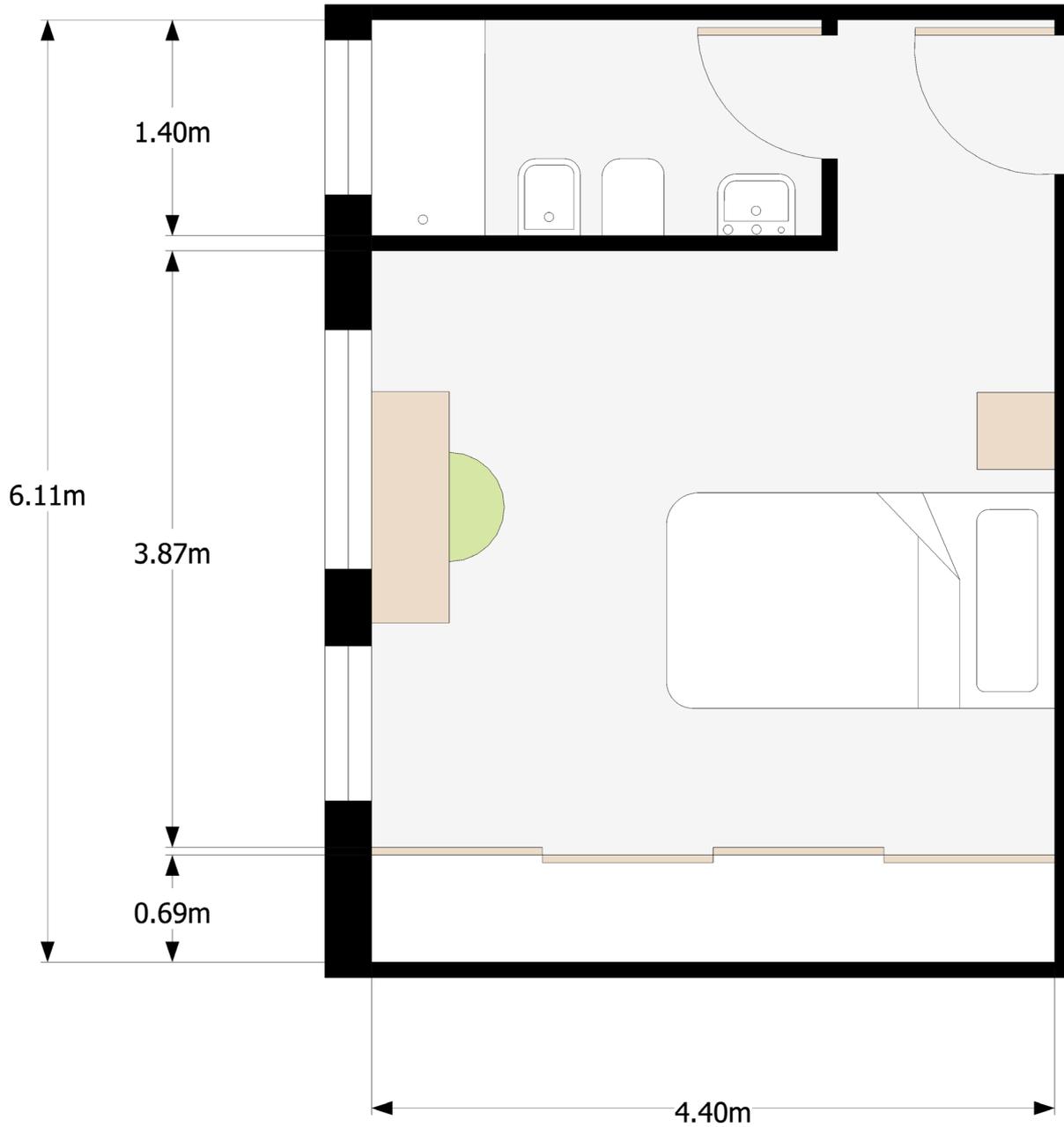
DETAILED SECTION

Technical Section Details of Industrial building Facade



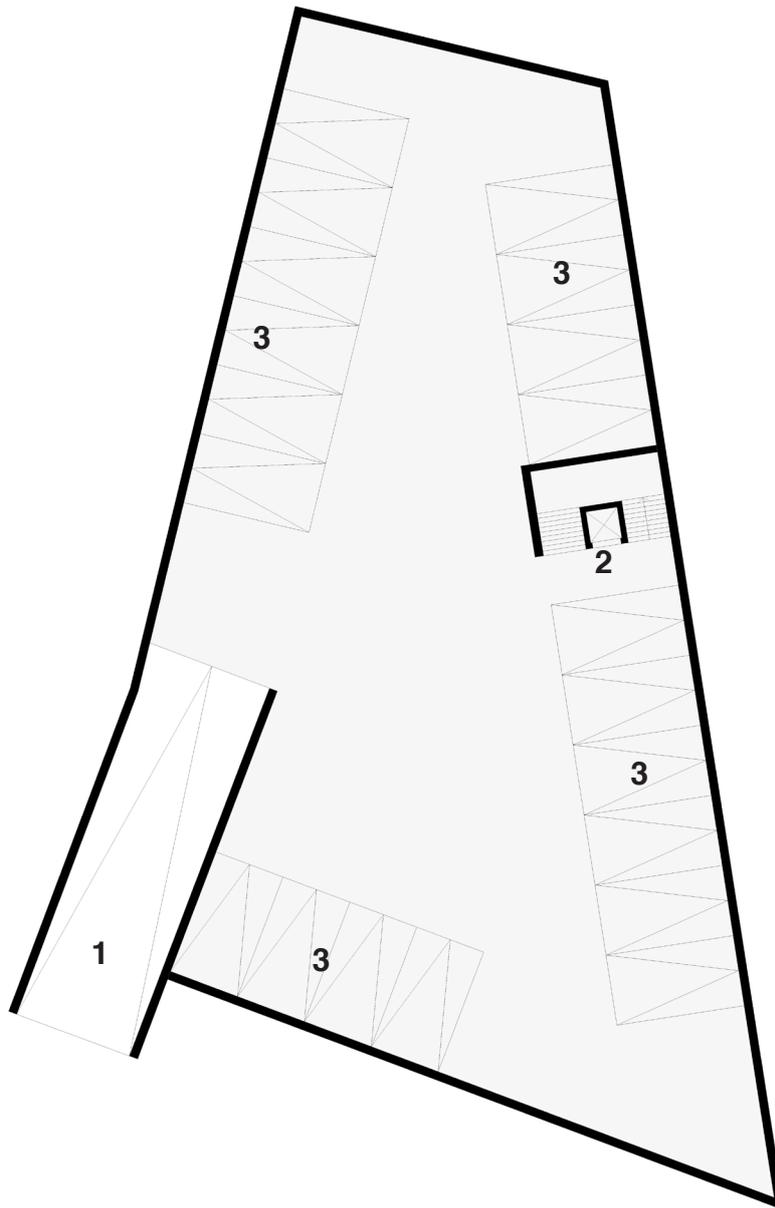
TYPICAL ROOM PLANS

Accommodation Building



UNDERGROUND LEVEL PARKING

Accommodation Building



Legend

- 1** Entrance Ramp
- 2** Lift/ Staircase
- 3** Parking Spaces

GROUND FLOOR

Accommodation Building



Legend

- 1 Entrance
- 2 Foyer
- 3 Reception Desk/ Office
- 4 Common Seating Area
- 5 Cafe/ Bar
- 6 Storage Area
- 7 Services/ Technical Room
- 8 Social Study/Reading Room

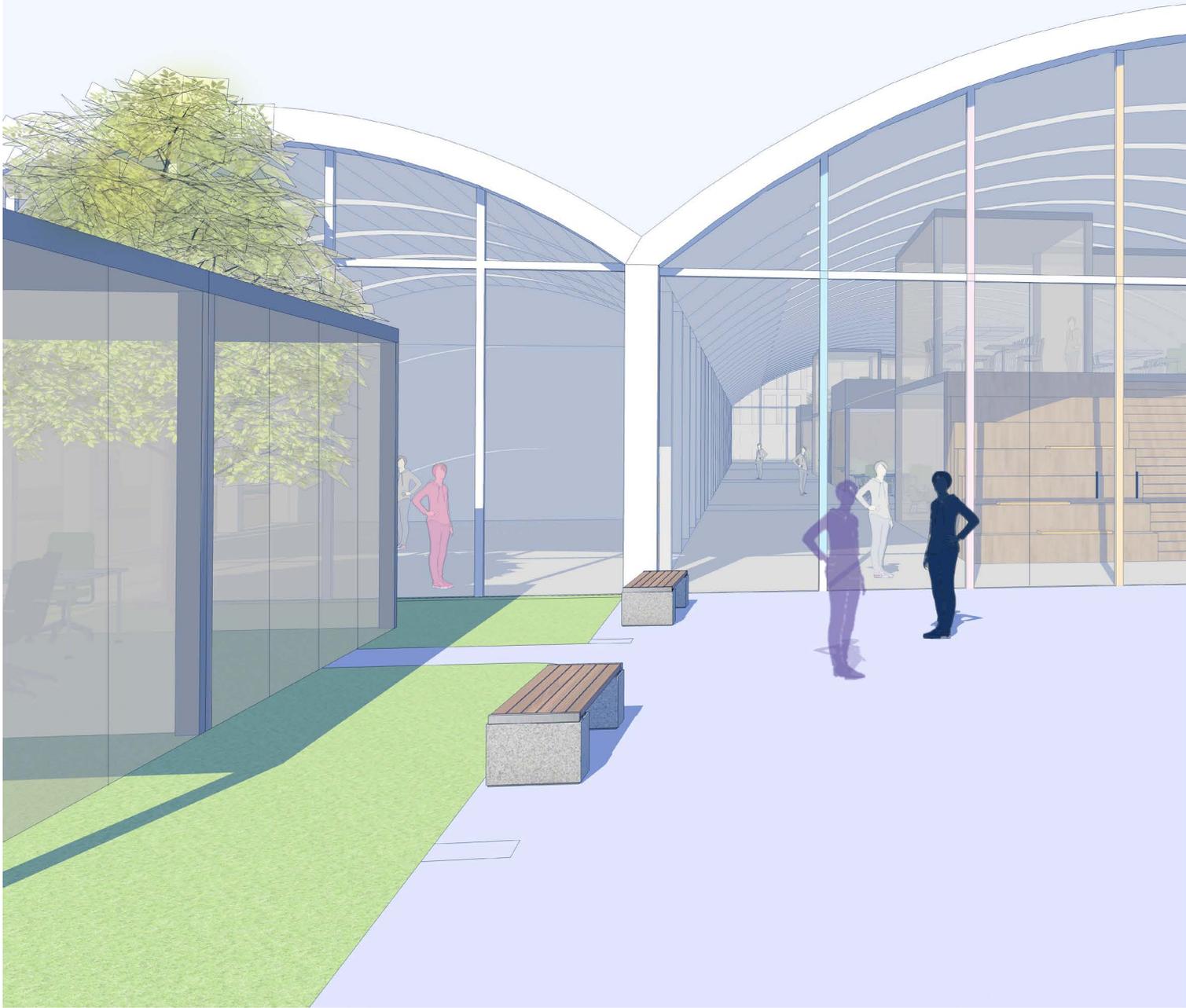
FLOORS 1-5

Accommodation Building



Legend

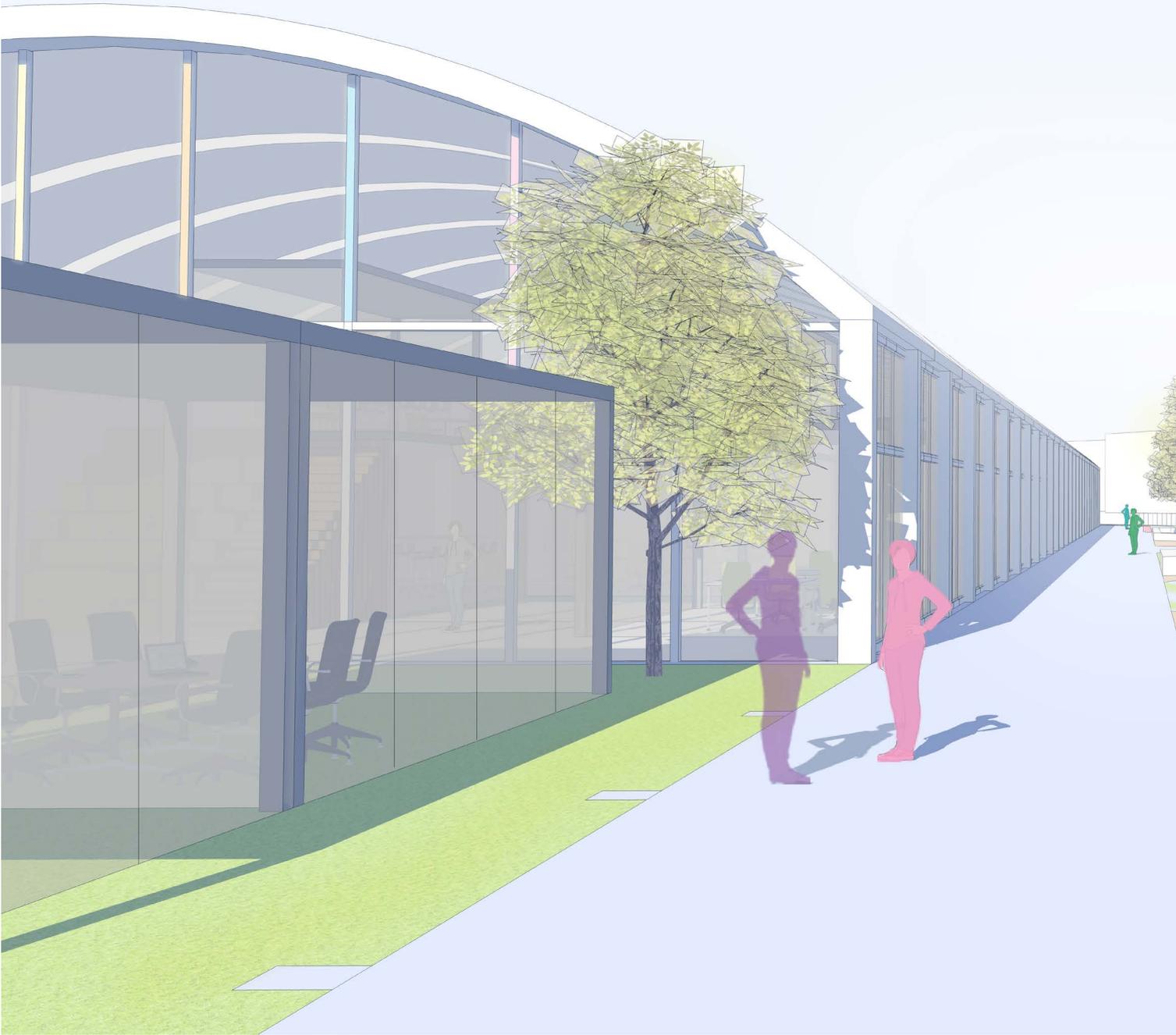
- 9** Bedrooms
- 10** Social Area
- 11** Mechanical/ Technical Room
- 12** Common Kitchen Dining Area
- 13** Stairs / Lift



MAIN ENTRANCE

Renovated Industrial Building





OUTDOOR SPACES

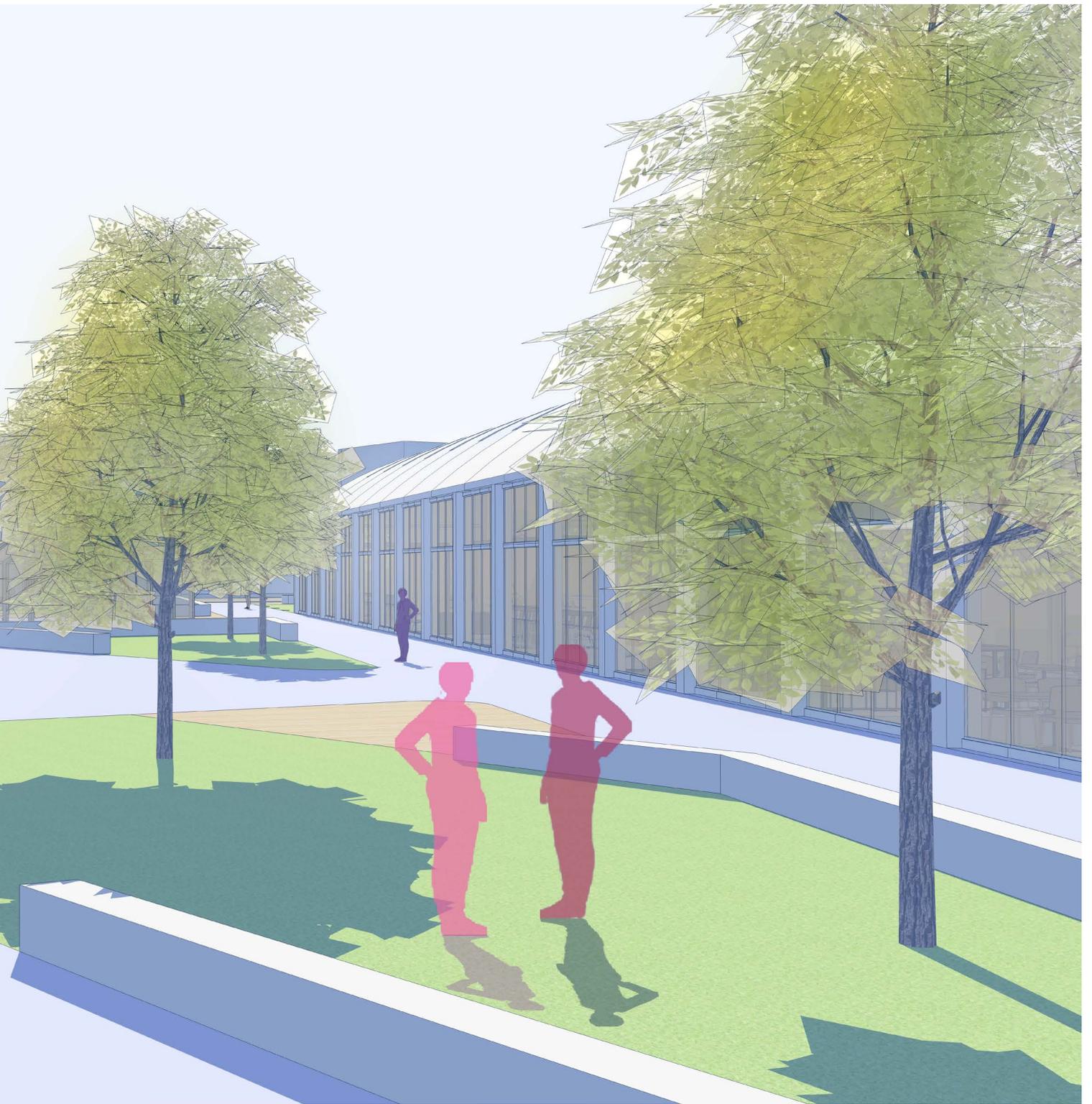
Renovated Landscape





COVERED OUTDOOR SPACES

Semi-Permeable Renovated Landscape



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Fig.2 “Stockholm 1972.” The Green Politics, 7 Sept. 2022, <https://thegreenpolitics.com/environmental-issues-globally/>.

Fig.3 “Earth Blue Banner Sign.” <https://www.pexels.com/photo/earth-blue-banner-sign-3039036/>. Accessed 19 May 2022.

Fig.4 “Sustainable Development Goals .” United Nations, United Nations, <https://www.un.org/sustainabledevelopment/blog/2015/12/sustainable-development-goals-kick-off-with-start-of-new-year/>.

Fig.5 “Green Deal Aims.” European Commission - European Commission, 18 Oct. 2022, https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#:~:text=The%20European%20Green%20Deal%20will%20improve%20the%20well%2Dbeing%20and,healthy%20and%20affordable%20food.

Fig.6 “Ruhr Innovation City, Modellstadt Bottrop” European Commission - European Commission, 18 Oct. 2022, https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#:~:text=The%20European%20Green%20Deal%20will%20improve%20the%20well%2Dbeing%20and,healthy%20and%20affordable%20food.

Fig.7 “Policies on Sustainable Development” Citt, Redazione Web. Città Di Torino - Servizio Telematico Pubblico, <http://www.comune.torino.it/>.

Fig.8 “The Global Green Building Leaders: Which Countries Are Leading the Way?” Uswitch, <https://www.uswitch.com/gas-electricity/global-green-building-leaders/>.

Fig.9 “Panoramic View of City of Paris” . <https://www.pexels.com/photo/panoramic-view-of-city-of-paris-2738173/>.

Fig.10 Stimmler, Heather, and Nicole R Rowan says: “How to Farm in Paris (without Owning Land) Secrets of Paris.” SECRETS OF PARIS, 27 Oct. 2020, <https://secretsofparis.com/make-a-difference/green-paris/farm-in-paris-without-land/>.

Fig.11 Stimmler, Heather, and Nicole R Rowan says: “How to Farm in Paris (without Owning Land) Secrets of Paris.” SECRETS OF PARIS, 27 Oct. 2020, <https://secretsofparis.com/make-a-difference/green-paris/farm-in-paris-without-land/>.

Fig.12 “The 1947 Finger Plan” Norman, Rebecca Thandi. Scandinavia Standard, 26 Apr. 2022, <https://www.scandinaviastandard.com/a-brief-look-at-urban-planning-in-copenhagen/>.

Fig.13 Norman, Rebecca Thandi. “A Brief History of Urban Planning in Copenhagen.” Scandinavia Standard, 26 Apr. 2022, <https://www.scandinaviastandard.com/a-brief-look-at-urban-planning-in-copenhagen/>.

Fig.14 Oueslati, Ala. "Green Cities of the World: Where, How and Why?" Youth Time Magazine, 25 May 2022, <https://youth-time.eu/green-cities-of-the-world-where-how-and-why/>.

Fig.15 Hosey, Mike. "Copenhagen: A Beacon of Urban Sustainability." Think Sustainability, 21 May 2020, <https://thinksustainabilityblog.com/2020/05/21/copenhagen-a-beacon-of-urban-sustainability/>.

Fig.16 Norman, Rebecca Thandi. "A Brief History of Urban Planning in Copenhagen." Scandinavia Standard, 26 Apr. 2022, <https://www.scandinaviastandard.com/a-brief-look-at-urban-planning-in-copenhagen/>.

Fig.17 "In the 1920s, Fiat Factory Workers Race on the Rooftop for the Test Track in Turin." In the 1920s, Fiat Factory Workers Race on the Rooftop for the Test Track in Turin ~, 29 Apr. 2019, <https://www.vintag.es/2019/04/1920s-rooftop-racetrack.html>.

Fig.18 Own Illustration

Fig.19 Own Illustration

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Fig.21 Own Illustration

Fig.22 Google Maps

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Fig.25 Ianetti, D., & Morino, S. (2019, February). RE-OSI GHIA Mapping complexity of an industrial artifact. Turin, Italy : Politecnico di Torino

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Fig.32 Own Illustration

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Fig.36 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.37 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.38 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.39 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.40 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.41 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.42 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.43 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.44 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.45 "New Lab." Marvel, <https://marvel designs.com/work/new-lab/76>.

Fig.46 Castro, Fernanda. "Coal Drops Yard / Heatherwick Studio." ArchDaily, ArchDaily, 26 Oct. 2018, <https://www.archdaily.com/904676/coal-drops-yard-heatherwick-studio>.

Fig.47 Castro, Fernanda. "Coal Drops Yard / Heatherwick Studio." ArchDaily, ArchDaily, 26 Oct. 2018, <https://www.archdaily.com/904676/coal-drops-yard-heatherwick-studio>.

Fig.48 Castro, Fernanda. "Coal Drops Yard / Heatherwick Studio." ArchDaily, ArchDaily, 26 Oct. 2018, <https://www.archdaily.com/904676/coal-drops-yard-heatherwick-studio>.

Fig.49 Castro, Fernanda. "Coal Drops Yard / Heatherwick Studio." ArchDaily, ArchDaily, 26 Oct. 2018, <https://www.archdaily.com/904676/coal-drops-yard-heatherwick-studio>.

Fig.50 Castro, Fernanda. "Coal Drops Yard / Heatherwick Studio." ArchDaily, ArchDaily, 26 Oct. 2018, <https://www.archdaily.com/904676/coal-drops-yard-heatherwick-studio>.

Fig.51 "Sculpture Garden: Moma." The Museum of Modern Art, <https://www.moma.org/audio/playlist/294>.

Fig.52 "Sculpture Garden: Moma." The Museum of Modern Art, <https://www.moma.org/audio/playlist/294>.

Fig.53 "Sculpture Garden: Moma." The Museum of Modern Art, <https://www.moma.org/audio/playlist/294>.

Fig.54 "Sculpture Garden: Moma." The Museum of Modern Art, <https://www.moma.org/audio/playlist/294>.

BIBLIOGRAPHY

Beatley, Timothy, et al. Green Cities of Europe: Global Lessons on Green Urbanism. Washington, D. C: Island Press, 2012.

Citt, Redazione Web. Città Di Torino - Servizio Telematico Pubblico, <http://www.comune.torino.it/>. The EU Green Deal – A Roadmap to Sustainable Economies. <https://www.switchtogreen.eu/the-eu-green-deal-promoting-a-green-notable-circular-economy/>.

Leyen, Ursula Von der. “Beautiful, Sustainable, Together.” New European Bauhaus, https://new-european-bauhaus.europa.eu/index_en.

Almssad, Asaad, and Amjad Almusaed. Sustainable Cities - Authenticity, Ambition and Dream. IntechOpen, 2019, <https://www.intechopen.com/books/6882>, Accessed 9 Apr. 2022.

Almusaed, Amjad, et al. Sustainability in Urban Planning and Design. IntechOpen, 2021, <https://www.intechopen.com/books/7831>, Accessed 19 May 2022.

Ashrae. ASHRAE Green Guide : the Design, Construction and Operation of Sustainable Buildings / [Compiled by ASHRAE]. Amsterdam : ASHRAE, 2006.

Euractiv, Frédéric Simon for. “The EU Releases Its Green Deal. Here Are the Key Points.” Climate Home News, Climate Home, 12 Dec. 2019, <https://www.climatechangenews.com/2019/12/12/eu-releases-green-deal-key-points/>.

“The European Commission’s Priorities.” European Commission - European Commission, 14 June 2021, https://ec.europa.eu/info/strategy/priorities-2019-2024_en.

Haughton, Graham, and Colin Hunter. Sustainable Cities / Graham Haughton and Colin Hunter. London : Kingsley : Regional Studies Association, 1994.

“In the 1920s, Fiat Factory Workers Race on the Rooftop for the Test Track in Turin.” In the 1920s, Fiat Factory Workers Race on the Rooftop for the Test Track in Turin ~, 29 Apr. 2019, <https://www.vintag.es/2019/04/1920s-rooftop-racetrack.html>.

“The Intergovernmental Panel on Climate Change.” IPCC, <https://www.ipcc.ch/>.

Ianetti, D., & Morino, S. (2019, February). RE-OSI GHIA Mapping complexity of an industrial artifact. Turin, Italy : Politecnico di Torino

“Mission and Vision: U.S. Green Building Council.” Mission and Vision | U.S. Green Building Council, <https://www.usgbc.org/about/mission-vision>.

James Parkes | 22 October 2021 Leave a comment. "Garden Added to Fiat's Lingotto Building Rooftop Test Track." Dezeen, 3 Feb. 2022, <https://www.dezeen.com/2021/10/22/benedetto-camerana-lingotto-building-fiat-turin/>.

Team, Go Construct. "Sustainability in Construction." Go Construct, <https://www.goconstruct.org/why-choose-construction/whats-happening-in-construction/sustainability-in-construction-1/>.

Uswitch | June 11, and Uswitch |. "The Countries with the Most Green Buildings." Building Design + Construction, 11 June 2021, <https://www.bdcnetwork.com/countries-most-green-buildings>.

"United Nations Conference on the Human Environment, Stockholm 1972." United Nations, United Nations, <https://www.un.org/en/conferences/environment/stockholm1972>.

"European Green Deal." Wikipedia, Wikimedia Foundation, 4 Sept. 2022, https://en.wikipedia.org/wiki/European_Green_Deal#cite_note-:2-20.

"Commission Announces 100 Cities Participating in EU Mission ." European Commission - European Commission, https://ec.europa.eu/commission/presscorner/detail/en/IP_22_2591.

"Green and Sustainable Buildings: The Need for People's Commitment." LabGov, 5 Jan. 2021, <https://labgov.city/theurbanmedialab/green-and-sustainable-buildings-the-need-for-peoples-commitment/>.

"The Global Green Building Leaders: Which Countries Are Leading the Way?" Uswitch, <https://www.uswitch.com/gas-electricity/global-green-building-leaders/>.

"Our Common Future: Report of the World Commission - United Nations." United Nations Sustainable Development, <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf?dtid=oblgzzz000659>.

"Stockholm Declaration ." UN Environment Document Repository Home, <https://wedocs.unep.org/bitstream/handle/20.500.11822/29567/ELGP1StockD.pdf>.

Stimmler, Heather, and Nicole R Rowan says: "How to Farm in Paris (without Owning Land) Secrets of Paris." SECRETS OF PARIS, 27 Oct. 2020, <https://secretsofparis.com/make-a-difference/green-paris/farm-in-paris-without-land/>.