

DEVELOPMENT AND ENHANCEMENT OF BROWNFIELDS AROUND EUROPE CASE STUDIES AND STRATEGIC POLICIES



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DEVELOPMENT AND ENHANCEMENT OF BROWNFIELDS AROUND EUROPE

CASE STUDIES AND STRATEGIC POLICIES

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To my teachers, Prof. M. Rebaudengo and Prof. M. Artuso for their support all along this work.

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To my parents who allowed me to realise this.

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To my friends, who were there all along.

INDEX

ABSTRACT

			•
1.	BROWNFIE		p.2
	1.1	Brownfield definition	
	1.2	Historical background	
	1.3	Urban densification	
	1.4	European Green Deal	
	1.5	Renovation wave	
2.	CASE STUDIES		p.7
	2.1	Content	-
		2.1.1 Structure	
		2.1.2 Choice of locations	
		_	

p.1

- 2.2 France
 - 2.2.1 La Sucrière, Lyon, France
 - 2.2.2 Bâtiment Porche, entrance of «MIN», Lyon, France
 - 2.2.3 Confluence Museum, Lyon, France
 - 2.2.4 H7, Lyon, France
 - 2.2.5 Caoutchouc Hall, Lyon, France
 - 2.2.6 Hikari Buildings, Lyon, France
- 2.3 Switzerland
 - 2.3.1 Elefant Building, Winterthur, Switzerland
 - 2.3.2 House of Adeline Favre, Winterthur, Switzerland
 - 2.3.3 Puls 5, Zurich, Switzerland
 - 2.3.4 Sihlcity, Zurich, Switzerland
 - 2.3.5 622 Hall, Zurich, Switzerland
- 2.4 United Kingdom
 - 2.4.1 Pennington Street Warehouse, London, United Kingdom
 - 2.4.2 Dundashill, Glasgow, United Kingdom
 - 2.4.3 Bellgrove Meat Market Site, Glasgow, United Kingdom
 - 2.4.4 Edinburgh Printmakers, Edinburgh, United Kingdom
- 2.5 Belgium

2.5.1 Bois du Cazier Site, Charleroi, Belgium

- 2.6 Germany
 - 2.6.1 Duisburg Nord Landscape Park, Duisburg, Germany
 - 2.6.2 Elbphilharmonie, Hamburg, Germany

2.7.1 Officine Grandi Riparazioni (OGR), Turin, Italy

- 2.7.2 BASE Cultural Centre, Milano, Italy
- 2.7.3 Niccolò Paganini Auditorium, Parma, Italy
- 2.7.4 First Mint of Italy, Rome, Italy

3. COMPILATION AND ANALYSES OF CASE STUDIES

- 3.1 Case studies overview
- 3.2 Comparison of the case studies
 - 3.2.1 Analysis price per square metres
 - 3.2.2 Analysis per activities

4. TURIN AREA BROWNFIELDS AND STRATEGIC POLICIES

- 4.1 Introduction
 - 4.1.1 Metropolitan City of Turin Past and future
 - 4.1.2 Trentametro initiative
 - 4.1.3 Choice of areas
- 4.2 Urban analysis
 - 4.2.1 Metropolitan City of Turin Homogeneous zones
 - 4.2.2 Metropolitan City of Turin Resident population
 - 4.2.3 Metropolitan City of Turin Main industrial areas
 - 4.2.4 Metropolitan City of Turin Brownfields sites
 - 4.2.5 Metropolitan City of Turin Workers in the main sectors
- 4.3 Former Brondi Area
 - 4.3.1 Presentation of the site
 - 4.3.2 Mobility
 - 4.3.3 Facilities
 - 4.3.4 Description
 - 4.3.5 Economical assessment
 - 4.3.6 Results
- 4.4 Former Pininfarina area
 - 4.4.1 Presentation of the site
 - 4.4.2 Mobility
 - 4.4.3 Facilities
 - 4.4.4 Description
 - 4.4.5 Economical assessment
 - 4.4.6 Results

5. CONCLUSION

p.132

p.96

p.106

6. BIBLIOGRAPHY AND SITOGRAPHY

p.134

ABSTRACT

Abandoned industrial areas are becoming more and more frequent in Europe. Due to new technologies and to less workers needed in industries, plants are closing or relocating leaving abandoned places.

With the problematic of lacking free lands and the need of new buildings for the still growing population, it is crucial to renovate those sites. Mainly because they are part of the heritage of the cities and are landmark buildings. But also, because the reuse of some elements of the buildings may reduce the costs.

Renovation of buildings being a topic included in the European Green Deal, it is starting to become something more recurrent. For this thesis, it was first defined what an abandoned industrial area is, what role it plays in Europe and what strategies have been put in place to reuse those sites. Then, an analysis of 22 case studies around Europe was carried out. Six projects in France, five in Switzerland. four in the United Kingdom, one in Belgium, two in Germany and four in Italy. For each of them, there is a description of the project and the history of the building and/or area is outlined with the related key dates. Moreover, the budget and surface area were important information to find in order to make a comparison and to use this information for the project part. Research by books and by websites was performed leading to the presented overview of the 22 case studies around Europe.

Then, two sites were selected to do a feasibility study. Urban and economic analyses were carried out and allowed to determine that those areas may wear a certain interest for investors.

Keywords: Brownfields, Dismissed area, Case studies

1. BROWNFIELD OVERVIEW

1.1 DEFINITION

A brownfield site is a land that was left abandoned after the industrial activity taking place there was stopped due to several reasons among which particularly the cessation of the activity or the change of location.

Brownfield sites can be considered an important part of the spatial reality, precisely because they have played a primary role in urban development and still currently participate in the transformed dynamics of the cities as material «put back into place».

The more widespread expression «dismissed areas» was developed into other equivalent or complementary meanings that have partly specified its definition but have reduced its general «sense» and specific spatial values; among the many definitions we recall: «weak areas», «under-utilised» areas, and, by contrast, «interstitial areas», or also by extension «urban voids».

All these terms contribute to defining the character of «weakness» these voids currently play in the urban context, especially as a contingent and symmetrical situation to the strong role these areas had in the past industrial structure, which placed them in a system of centrality with respect to the surrounding area.

Even the expression «urban void», by means of a conceptual extension, embraces other and more general situations with respect to the disused or underused areas alone, as they are again made available for various reasons. Those sites that are considered as 'voids' (because they no longer have the functions for which they were created) are in reality almost always very 'full': of artefacts, often of considerable interest for the history of industry and technology; of individual and collective memories; of work culture; of symbolic values and local history; of informal uses, perhaps on the margins and sometimes outside the law.

Generally, the brownfields are from: heavy

industry (in particular metallurgy, energy and fertiliser production), sites related to fine chemical, military activities (problems of risk, danger and pollution), and the cessation of the activity by assembly companies or agri-food activities (potential health threat). Abandoned brownfields often have a negative impact on the environment. Therefore, those lands usually need to be cleaned up before being renovated with the related costs to be taken into consideration for the renovation.

1.2 HISTORICAL BACKGROUND

The industrial sector developed considerably during the 19th century.

During this period several inventions and innovations were found, as for example the steam engine. Fuelled by coal, the steam engine contributed to the multiplication of machines and the development of industries with the consequence of reducing agricultural work by their mechanisation. The industries that were especially developed were related to transport. For example, the companies related to trains, railways or mines. With this rise of industries, the territory was transformed and industrial districts were created.

This led to a social transformation. In fact, a lot of people from the countryside came to the city to find new jobs in the industries since the agricultural ones needed less people. The centre of the cities started to be very populated causing an increase of poverty and squalor. As a consequence, different social classes emerged, like the bourgeoisie that consisted in the owners of the houses. The population inequality was very high at this period of time.

«In the 20th century, and especially after World War 2, European cities began to grow very rapidly. Historic inner-city areas currently occupy less than 5% of the total urban area of old cities. This implies that the industrial sites dating from the beginning of the 20th century are no longer situated on urban peripheries, but are to be found in the central areas of the cities. A consequence of this growth was that the old city centres became far too small to meet the needs of these enlarged cities, so there was also a growing need to expand the centres.

To meet this need, many of the old urban industrial sites in European cities have been transformed into functional extensions of the old inner cities. In some cases, the old buildings and infrastructure have been included in the new plans to retain the historic character of the area; in other cases re-development has brought about a total transformation, making it hard to recognise anything of the historic appearance in the one.»¹

Since the 1970s, many areas of Western Europe have undergone an extremely violent process of deindustrialisation in successive bursts. This has resulted in the closure of numerous production sites, the disappearance of knowledge, the loss of millions of jobs, the multiplication of industrial wastelands and the disruption of societies organised around and by industry. As the heirs of two industrial revolutions, the territories of Western Europe were in the process of losing their capacity to produce material goods and becoming post-industrial societies dedicated solely to tertiary activities. Industry would no longer be able to be the «driving force» of European economic growth and the structuring element of the socio-economic coherence of territories.

Little by little the territories were left abandoned and became brownfields.

1.3 URBAN DENSIFICATION

As the population grows in the world, the need for new homes is critical. Construction needs

to find another way to build as the surface of the cities is already almost completely occupied and as it is not possible to continue replacing agricultural ground with new buildings. For this reason, the strategy of re- purposing old buildings might be part of the solution.

Actually, the following four strategies may be distinguished:

«- increasing the efficiency of the use of the existing buildings by transforming their functions (changing functions, adapting unused space),

- building up on free spaces in the city (construction, extension, infill),

- transforming space below and over existing buildings (downward and upward extensions),

- replacement of existing buildings (demolition of existing and construction of new buildings).»²

All these four strategies have their pros and cons and for every project there might be one more suitable than the others. Therefore, it is necessary to perform not only a comprehensive analysis of the situation of the land, but also to establish a good prediction plan with several variations to enable choosing the best option.

1.4 A EUROPEAN GREEN DEAL

«Striving to be the first climate-neutral continent.»³

To achieve this by 2050, the European Commission created the European Green Deal. Various policies were put in place in order to allow «European citizens and businesses to benefit from sustainable green transition.»⁴

The European Green Deal purpose is to set the different challenges related to climate and environment problems. «It is a new growth

¹ Brebbia, C. A. (2006). Re-using urban industrial areas: the case of 's-Hertogenbosch, the Netherlands. In *Brownfields Sites III: Preventions,* Assessment, Rehabilitation and Development of Brownfield Sites (p. 3). Wit Press.

² Pelczynski, J., & Tomkowicz, B. (2019). *Densification of cities as a methodof sustainable development - IOPscience*. IOP Science. Retrieved 20 September 2021, from <u>https://iopscience.iop.org/article/10.1088/1755-1315/362/1/012106</u>

³ *A European Green Deal* | : Striving to be the first climate-neutral continent european green dealEPEA Switzerland. (2019, December 18). EPEA Switzerland. Retrieved 20 September 2021, from https://www.epeaswitzerland.com/2019/12/a-european-green-deal/

⁴ *A European Green Deal* | : Striving to be the first climate-neutral continent european green dealEPEA Switzerland. (2019, December 18). EPEA Switzerland. Retrieved 20 September 2021, from https://www.epeaswitzerland.com/2019/12/a-european-green-deal/

strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. It also aims to protect, conserve and enhance the EU's natural capital, and protect the health and well-being of citizens from environment-related risks and impacts. At the same time, this transition must be just and inclusive. It must put people first, and pay attention to the regions, industries and workers who will face the greatest challenges.⁵

Eight policies can be distinguished:

«- a zero pollution ambition for a toxic-free environment

- preserving and restoring ecosystems and biodiversity

- from 'Farm to Fork': a fair, healthy and environmentally friendly food system

- accelerating the shift to sustainable and smart mobility

- building and renovating in an energy and resource efficient way

- mobilising industry for a clean and circular economy

- supplying clean, affordable and secure energy

- increasing the EU's Climate ambition for 2030 and 2050.»⁶

From these eight policies, the current thesis is going to focus on *renovating in an energy and resource efficient way*.

Indeed, renovation is very important in the construction sector. In Europe, «the construction, use and renovation of buildings require significant amounts of energy and mineral resources (e.g. sand, gravel, cement). Buildings also account for 40% of energy consumed. Today the annual renovation rate of

the building stock varies from 0.4 to 1.2% in the Member States. This rate will need at least to double to reach the EU's energy efficiency and climate objectives.»⁷ In order to be energy efficient and affordable, the Member States of the EU need to start a 'renovation wave' of public and private buildings.

1.5 RENOVATION WAVE

In order to reach the Europe climate-neutrality (net zero emissions) by 2050 it is crucial to renovate buildings. Currently, «only 1% of buildings undergo energy-efficient renovation every year.»⁸ At the moment, about 75% of the buildings are not energy efficient and 85% to 95% of them will still be in use in 2050. Renovating public and private buildings is essential to reach the objectives of the European Green Deal.

The renovation wave, a new strategy boost, was put in place to double the annual energy renovation rates in the next 10 years and also to reduce the emissions. In addition, this will allow to improve the quality of life for the people living in those buildings and also create green jobs in the construction sector.

Moreover, the renovation of buildings allows to tackle heating problems. It will reduce the energy bills of the inhabitants. In fact, almost 34 million Europeans are unable to afford to heat their home properly, because they need to heat it a lot due to the defunct way of construction. Consequently, they have to pay a lot.

Finally, every European country needs to create a long-term renovation strategy in order to achieve the objectives set for 2050.

⁵ European Commission. (2019, December). *The European Green Deal.* (p.2)

⁶ European Commission. (2019, December). The European Green Deal. (p.3)

⁷ European Commission. (2019, December). The European Green Deal. (p.9)

⁸ Renovation wave - Energy European Commission. (2021, August 6). European Commission - Energy. Retrieved 20 September 2021, from https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en

CASE STUDIES CONTENT

The focus of this chapter is on the analysis of 22 case studies.

2.1.1 STRUCTURE

The case studies are classified by country and described according to a template thought to enable easily finding and comparing the information. The first part with the general information of the project is followed by the description of the project. Next, the history of the building and/or area is described with the related key dates. Then, the positive and negative outcomes are outlined with the lessons that can be drawn from the project. Finally, the map of the project and area is shown.

2.1.2 CHOICE OF LOCATIONS

The research was carried out on a European level in order to dispose of a variety of data to allow for comparison.

Research on industrial areas was undertaken and resulted in the selection of the cities of Lyon (FR), Glasgow (UK) and Charleroi (B), followed by in-depth research was made to identify the specific sites and buildings that are analysed in this chapter. For example, concerning the Lyon Confluence district, I delved this zone, because I visited it during my Bachelor and also because it was discussed in the course I attended to at Politecnico di Torino on Urban Planning.

In addition, some places and offices emerged from discussions with colleagues about the topic. I carried out further studies on the areas and architects that came out. This shows that it is always worth benefiting of the knowledge acquired by others. Actually, this is what extends our horizon and increase our knowledge.

Then, I performed a research of case studies in Switzerland, because it is where I am from and it was important for me to see how it is handled in my country despite not being within the EU. I knew that the German part of Switzerland hosts a lot of brownfields. So, this is where I concentrated my searches. It was really interesting to search projects in an area that I did not know very well to get to know better the place and ultimately my country.

The buildings were chosen when the brownfield type was notable and also if there was enough information available.

In order to gain a good understanding of the process it was important to select different types of brownfields like abandoned land or abandoned building, but also different types of projects, such as renovation, new construction or a combination.

Moreover, one important thing was to identify the economic aspect of each project, in order to be able to bring the projects into comparison. This data was often hard to find and in many cases not available. For one project the economical aspect was available, but not the surface of the concerned area. So, with the help of the plan extracted from the «Mapbox»⁹ website it was possible to determine an approximate number.

Finally, a relevant translation work was done for the French, Swiss, Belgian, German and Italian case studies. In fact, for several projects the information was only available in the language of the country. I translated it from French, German and Italian.

9 Mapbox | Studio. (n.d.). Mapbox. Retrieved 1 September 2021, from https://www.mapbox.com/mapbox-studio

2.2FRANCE2.2.1LA SUCRIÈRE

and	
Location:	Fig. 1 - Outdoor of «La Sucrière» 49 Quai Rambaud, 69002 Lyon, France
Brownfield type:	Abandoned building
Project type:	Renovation
Architecture Studio:	Z Architecture
Date of project:	2011
Budget:	10'443'700 € (excluding taxes)
Surface:	11'456 m² Net Floor Area
Stakeholder:	SCI Espace Sucriere (VNF+ICADE Promotion)
Activities:	Multipurpose spaces (exhibitions, concerts, shows, museum, con- ventions, congress) Office spaces Rooftop (clubs, conferences, concerts, bar)
Sustainable aspect:	Low-energy consumption renovation

Project description

The building is located on the docks of the Lyon Confluence district near the Saône river. The goal of this project was to convert the previous industrial building from the 1930's into a cultural and events facility that includes multipurpose spaces, office spaces and a rooftop. The main building of «La Sucrière» is 100m long, 27m wide and 18m high. There are also three silos, which measure 10m of diameter and 22m high each.

One important architectural aspect was to keep the real value of the building. For this reason, the original character of «La Sucrière» was preserved. Moreover, while the building maintains the feeling of the original Port Rambaud, it also offers a great and innovative quality of use. three pre-existing silos and another part in the main building. In this space, the inner structure was destroyed in order to provide a high ceiling. This space is used for the Biennale of contemporary Art of Lyon.

In the northern part of «La Sucrière», office spaces were designed in the two renovated storeys with the creation of big loggias. They offer a view on the Saône river and allow the light to penetrate this wide building.

Finally, the upper part of «La Sucrière», the rooftop, holds a club that can welcome up to 800 persons. This space offers a unique view on the landscape and the silos of the building.

In the southern part of «La Sucrière», an exhibition space was created. One part is in the



Fig. 2 - Outdoor of «La Sucrière»



Fig. 4 - Exhibition space of «La Sucrière»



Fig. 3 - Loggia of «La Sucrière»



Fig. 5 - Rooftop of «La Sucrière»

History

Lyon Confluence.- This area was for a long time characterised by its port and logistic activities. «La Confluence» was an isolated neighbourhood. This district was first designed in 1771 by Michael-Antoine Perrache, who launched a plan to drain and fill in the lônes (dead backwaters of the Rhône). It took seven decades to complete this construction project. During the 20th century, «La Confluence» became an industrial area. Little by little, the activities in the area stopped and the port closed in 1994. In 2003, the design of the new development for the zone started. «La Sucrière» is part of the first zone of development (ZAC1).

La Sucrière.- From 1925, when the building was constructed, until 1928, it was used as a warehouse. Afterwards, it welcomed the sugar factory. The building was utilised until the 1990's when the area was chosen to be renovated.



Fig. 6 - Inside of the building «La Sucrière» before renovatio



Fig. 7 - Inside of the building «La Sucrière» before renovation



Outcomes

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The renovation of «La Sucrière» preserves the city heritage.

The new spaces created offer unique views on the local landscape.

The reuse of the shell of the building is a positive aspect. The project doesn't include a complete destruction. The reuse factor is an important aspect for the life cycle of a building.

The building is transformed into a cultural centre. This means that it attracts more people and brings life to this area.



Fig. 8 - Exhibition space of «La Sucrière»



Fig. 9 - Interior part of «La Sucrière»



source: Mapbox | Studio. (n.d.). Mapbox. Retrieved 1 September 2021, from https://www.mapbox.com/mapbox-studio

2.2.2 BÂTIMENT PORCHE, ENTRANCE OF «MIN»

and	Fig. 10 - Outdoor of «Bätiment Porche»	
Location:	34 Rue Casimir Périer, 69002 Lyon, France	
Brownfield type:	Abandoned building	
Project type:	Renovation	
Architecture Studio:	Atelier d'architecture Carte Blanche	
Date of project:	2019 - 2022	
Budget:	3'300'000 €	
Surface:	1'600 m² Net Floor Area	
Stakeholder:	SPL Lyon Confluence	
Activities:	Increase in the capacity of the concert hall Public spaces (coffee shop, meeting rooms, exhibition space) Reorganisation of work spaces Redevelopment of the artist reception areas	
Sustainable aspect:	Global energy renovation (objective: Low-energy consumption ren- ovation) Integration of renewable energy	

Project description

The project is currently underway.

The building is located on the wholesale market area on the southern part of the Lyon peninsula in front of the Rhône river. The renovation project, which was given the label SMAC (Salle de Musiques Actuelles) thanks to its quality of cultural and artistic aspects, proposes an active and festive space, representative of the alternative spirit of la «Salle de Musiques Actuelles» (SMAC).

The capacity of the concert hall will increase from 300 to 400 seats. The new organisation of the building will make room for new uses that will encourage meetings between artists and all kind of audiences. Bar, stage areas, meeting rooms and offices will be the new places for exchange. the public. Therefore, the project has several sustainable strategies. The aim is to achieve the Low-energy consumption renovation. More than 160 m² of photovoltaic panels will be installed on the roof in order to produce electricity. Moreover, a connection to the urban heating network will be created that will allow two-thirds of the energy to be supplied by renewable or recovered energy. Additionally, since the neighbourhood is being densified, it was important to think about the noise pollution. The architects focused on this problematic and provided optimal management of noise pollution caused by the hall and due to the flow of the public, before, during and after the concerts.

The building must be brought up to current standards, so that it can continue to welcome



Fig. 11 - Outdoor of «Bâtiment Porche»



Fig. 13 - Outdoor of «Bâtiment Porche»



Fig. 12 - Concert hall of «Bâtiment Porche»



Fig. 14 - Staircase of «Bâtiment Porche»

History

Lyon Confluence.- The «Bâtiment Porche» is part of the second zone of development (ZAC2).

Bâtiment Porche.- The building was part of the whole complex of the old national wholesale market («Marché d'Intérêt National» -MIN) built in the 1960's. It was used to house the administration part. In 2006, the purpose of the building changed. It became a contemporary music centre offering a unique music program. It was decided to renovate the building to keep the heritage of this part of the city and to maintain the musical activity that was present on this site.



Fig. 15 - «Bâtiment Porche» before renovation



Fig. 16 - Inside of the «Bâtiment Porche» before renovation



- end of renovation

Outcomes

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This renovation preserves the heritage of the city. The project of the renovation maintains the exterior aspect of the main façades of the old building.

This building is going to welcome a concert hall and become a cultural centre. This will attract people to the area and bring life to the place.

The project includes several sustainable strategies that will improve the life cycle of the building.



2.2.3 CONFLUENCE MUSEUM





Location:

Fig. 17 - Outdoor of the «Confluence Museum»

	86 Quai Perrache, 69002 Lyon, France	
Brownfield type:	Abandoned land	
Project type:	New construction	
Architecture Studio:	COOP HIMMELB(L)AU - Wolf D. Prix & Partner ZT GmbH	
Date of project:	2010 - 2014	
Budget:	328'500'000 €	
Surface:	26'700 m² Net Floor Area	
Stakeholder:	Conseil Géneral du Rhône	
Activities:	Museum, exhibition spaces, auditorium, conference spaces Coffee shop, restaurant, book shop	
Sustainable strategies:	The foyer is a naturally ventilated space The floors are cooled via ground water that will result in energy savings in the long terms The exhibition area has a efficient shell in terms of thermal insulation The main access areas have natural light	

Project description

The «Confluence Museum» project is located at the southern tip of the Lyon peninsula, where the Rhône and Saône rivers meet. «Even though it was clear that this site would be a difficult one»¹⁰ (due to its position on the water 536 piles had to be securely driven 30 metres into the ground), «it was clear that this location would be very important for the urban design.»¹¹ The location of the museum acts as the access to the town from the South, but also as the starting point of the development of the neighbourhood.

One of the first ideas was to have fluent flows of visitors. For this reason, the building was imagined as being floating on supports only in some parts to allow to have public spaces underneath. Furthermore, the ground floor being open allows the visitors to continue their path to the garden where rest areas and green spaces are present. It also offers a unique view on the junction of the two rivers.

The building is developed in three main parts, the Crystal, the Cloud and the «Escape liant». The Cloud contains the black boxes for the exhibition areas. The Crystal, by opposition, has a transparent structure and holds the foyer of the museum. The «Escape liant» is the connection between the two. This path ends on a view of the confluence of the two rivers.

10 Castro, F. (2021, April 30). *Musée des Confluences / Coop Himmelb(I)au. ArchDaily.* Retrieved 1 September 2021, from <u>https://www.archdaily.com/585697/musee-des-confluences-coop-himmelb-I-au</u>

11 Castro, F. (2021, April 30). *Musée des Confluences / Coop Himmelb(I)au. ArchDaily.* Retrieved 1 September 2021, from <u>https://www.archdaily.com/585697/musee-des-confluences-coop-himmelb-l-au</u>



Fig. 18 - Outdoor groundfloor of the «Confluence Museum»



Fig. 20 - Vertical circulation on the «Confluence Museum»



Fig. 19 - Foyer of the «Confluence Museum»



Fig. 21 - View from the «Confluence Museum» on the two rivers

History

Lyon Confluence.- The «Confluence Museum» is part of the second zone of development (ZAC2).

Confluence Museum.- Before the decision of the construction of the museum the bowling complex Edouard-Herriot was present on the site, which has been relocated in the North of the city to vacating the site for the museum.



Fig. 22 - Construction of the «Confluence Museum»



Fig. 23 - Construction of the «Confluence Museum»



Outcomes

lion Euros.

t

The museum has become a landmark of the city. It attracts people to the area and brings life.

The building was built with new technologies that bring it up to date.



Fig. 24 - Outdoor of the «Confluence Museum»



Fig. 25 - Vertical circulation in the «Confluence Museum»



2.2.4 H7

and	Fig. 26 - Outdoor of «HZ»	
Location:	70 Quai Perrache, 69002 Lyon, France	
Brownfield type:	Abandoned building	
Project type:	Renovation	
Architecture Studio:	Vurpas Architectes	
Date of project:	2015 - 2019	
Budget:	7'060'000 € (excluding taxes)	
Surface:	4'083 m²	
Stakeholder:	SPL Lyon Confluence	
Activities:	Space for events Structure for young digital start-ups Food hall	
Sustainable aspect:	Photovoltaic panels on the roof	

Project description

The building is located on the southern part of the Lyon Confluence neighbourhood and has a façade directed to the Rhône river.

«The H7 project constitutes the transformation of this industrial heritage to service new ways of working, emblematic of the metamorphosis of the Confluence district towards innovation and creativity. (...) Opening the former factory onto the environment is also a way of reinventing a new living space, of occupying the large industrial space with more freedom, more comfort, and more room to breathe. (...)

(...) It preserves the structure and envelope which are of course indispensable, as the primary components of the space, providing protection and a space which exchanges with the exterior, and because they are the most durable parts of the project. It also speaks the architectural language of the place, which is vital in order to resonate with its temporality. Finally, it proposes a simple and effective architectural response, adapted to the specificities and potential of this industrial hall, as well as the innovative future uses which may emerge, and the unpredictability of the digital ecosystem.

(...) The generous volumes, with no load-bearing features in the main central nave for the events area, the large surface available and the quality of overhead light from the southern shed roofs for the tertiary spaces.»¹²

12 VURPAS ARCHITECTES, KEVIN DOLMAIRE, Brice Robert · H7 — Lyon Confluence. (n.d.). Divisare. Retrieved 1 September 2021, from https://divisare.com/projects/415660-vurpas-architectes-kevin-dolmaire-brice-robert-h7-lyon-confluence



Fig. 27 - Main façade of «H7»



Fig. 29 - Office spaces of «H7»



Fig. 28 - Event space of «H7:



Fig. 30 - Event space of «H7»

History

Lyon Confluence.- «H7» is part of the second zone of development (ZAC2).

H7.- The building belonged first to Laurent Chevalier. It was a boiler making plant, the largest mechanical and heavy metalwork company in Lyon. In 1880, the society became a public limited company after Chevalier went into a partnership with Grenier and took the name «Compagnie des Ateliers et Chantiers du Rhône». In 1887, the workshops were taken over by J. Martin, who was succeeded by Parent and Michelon. From 1904, the company was taken over by Paul Dulac and Nas. In 1924, the site extended to the West, in the workshops of the company Petit et Cie, with the creation of a railway connection crossing Rue Wuillerme. In 1946, the family society J. Girard Son moved in. The company specialised in the wholesale trade of fuel and coal for four generations of Girard's.



ig. 31 - «H7» before renovation



Fig. 32 - «H7» and neighbourhood before renovation



Outcomes

+

This renovation allows the preservation of the heritage of the city, 75% of the original building is preserved.

Enhancement of the main façade.

This project creates a new place of life in the area, a new meeting point and a space with more freedom and comfort.



Fig. 33 - Façade and outdoor of «H7»



Fig. 34 - Office spaces of «H7»



CAOUTCHOUC HALL 2.2.5





Location:

Fig. 35 - Outdoor of «Caoutchouc Hall»

Rue Vuillerme, 69002 Lyon, France

Brownfield type:	Abandoned land
Project type:	Renovation
Architecture Studio:	SITL
Date of project:	2019 - 2023
Budget:	6'030'000 € (excluding taxes)
Surface:	4'100 m²
Stakeholder:	6e Sens Immobilier

Activities:

Office spaces (work places, meeting spaces) Relax spaces Catering spaces Fitness

Sustainable aspect:

New part with low energy impact Natural ventilation and efficient cooling system Rainwater harvesting for sanitary facilities and watering

Project description

The transformation of the former «Caoutchouc Hall» located in Lyon is one of the operations to be carried out in the future «Champ de La Confluence». The guiding principle of this renovation is to affirm the industrial character of a hall steeped in history, while designing a building that is open to a «landscaped» environment.

The project aims to maintain the original roofing arrangements in order to preserve the heritage character of the hall. In the same vein, the large central glass roof is restored, as well as the sheds of the side aisles: the work spaces thus receive homogeneous light from the north and the heart of the hall, the «village square», is bathed in light all day long.

The character of the East-West longitudinal façades is enhanced by the creation of bays that follow the repetitive rhythm of the interior spans. Through the demolition of the northern

spans the hall acquires a new identity, which transcends its historical use towards contemporary programmes. This demolition is an opportunity for the project to creates a new access to contemporary architectural language at building scale.

On the sustainable point of view, the project intends to use local wood for the new construction part for the structural elements. Moreover, the project should be connected to the district heating network. Then, vegetation planting will provide freshness to the heart of the building.



Fig. 36 - General view of «Caoutchouc Hal



Fig. 38 - Relax spaces of «Caoutchouc Hall»



Fig. 37 - Main entrance of «Caoutchouc Hall



Fig. 39 - Office spaces of «Caoutchouc Hall»

History

Lyon Confluence.- the «Caoutchouc Hall» is part of the second zone of development (ZAC2).

Caoutchouc Hall.- It is the former rubber factory. This hall of the old market station was built in 1917. It is distinguished by its large volume, its three naves, and its roof with sheds. The idea is to demolish and renovate a part of the building or more precisely to highlight certain remarkable elements.



Fig. 40 - «Caoutchouc Hall» before renovation



Fig. 41 - Main space of «Caoutchouc Hall» before renovation



2023 - end of renovation

Outcomes

This renovation will preserve the heritage of the city. While keeping the structural aspect of the industrial building, it will allow to give a contemporary dimension.

The project intends to use several sustainable solutions.

The «Caoutchouc Hall» and the former «Girard Hall» («H7») form a unitary site. These two former industrial buildings enter into a dialogue with the landscape screen of the field. This dialogue is established both through the unity of the volumes, with their historical profiles, and through the materiality of their envelope.



Fig. 42 - Main space of «Caoutchouc Hall» before renovation



Fig. 43 - Outdoor of «Caoutchouc Hall» before renovation



2.2.6 HIKARI BUILDINGS


The project was carried out as a new waterfront city, located at the confluence of the Sâone and Rhône rivers in the South of Lyon. «Hikari» means light in Japanese. The light is the element on which the project was based, as it was the light that defined the energy saving process.

Three buildings were designed, «Higashi» (East) for office spaces on seven floors, «Minami» (South) for 32 dwellings and «Nishi» (West) for office spaces on five floors on the roof of which four urban villas were also built. Cut-outs (notches) made on the buildings, slight staggers between floors, glazed screens with built-in solar power panels, all subtly control light that helps connect nature and humans.

Abundant use of local stone makes up the grey exterior, the angles of which change gradually, giving varied expressions of light and shadow. It also harmonizes with the brilliance of the water's surface.

The building is said to be energy positive. To achieve this performance, the designers used the best techniques of bioclimatic architecture, but above all they mixed offices, housing and shops on the ground floor, in order to manage the different uses and cycles of energy as rationally as possible.

Inside the buildings, sensors measure the temperature, detect CO2 and the presence of people in the rooms, monitor ventilation and lighting. In short, they record a whole series of parameters that enable to regulate at central level the production of heat and cold in real time and as accurately as possible. An innovative rapeseed co-generation plant was planned to cover 70-80% of electric and 90% of heating evaluated needs.



Fig. 45 - Inner courtyard of «Hikari Buildings»



Fig. 47 - Interior façade of «Nishi Building»



Fig. 46 - Exterior façade of «Minami Building»



Fig. 48 - Exterior façade of «Minami Building»

Lyon Confluence.- «Hikari» is part of the second zone of development (ZAC2).

Hikari Buildings.- The realization of "Hikari" is part of the Lyon Smart Community project, which is the result of a partnership between the Metropolis of Lyon and NEDO (New Energy and Industrial Technology Development Organization), the Japanese environmental and innovation agency. Lyon Confluence was in charge of the project management and general coordination with Toshiba, NEDO's industrial partner.



Fig. 49 - Façade of «Higashi Building»



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The completion of the «Hikari» mixed-use program, as part of Lyon Smart Community, has made Lyon Confluence a pioneering district. It is one of the first large scale mixed-use positive energy building (PEB) complexes in Europe.



Fig. 50 - Outdoor of «Hikari Buildings»

Four years after completion the inhabitants of the buildings are disappointed. Actually, the technology implemented is not mastered. Moreover, the rapeseed co-generation plant only operates at 30% instead of the planned 70%, with exorbitant operating costs and repeated breakdowns.



Fig. 51 - Balconies of «Minami Building»



source: Mapbox | Studio. (n.d.). Mapbox. Retrieved 1 September 2021, from https://www.mapbox.com/mapbox-studio

2.3 SWITZERLAND2.3.1 ELEFANT BUILDING





Location:

Fig. 52 - Outdoor of «Elefant Building»

Zürcherstrasse 31, 8400 Winterthur, Switzerland

Brownfield type:

Abandoned building

Project type:

Architecture Studio:

Werbebrunner Architects

102'600'000 CHF

13'014 m² Net Floor Area

Implenia Schweiz AG

Renovation and new construction

Date of project:

2020 - 2022

Budget:

Surface:

Stakeholder:

Activities:

Office spaces

Sustainable strategies:

Wooden construction Minergie label Energy efficiency path Photovoltaic panels on the roof

The area where the «Elefant building» is located is in the centre of Winterthur. It has been gradually converted into a new neighbourhood with apartments, workplaces and public facilities from 1990.

Lokstadt (name of the new district) is now being built on the site of the Swiss Locomotive and Machine Factory (SLM) workshop.

«Elefant» was also the name of the largest and most powerful steam locomotives of the SLM designed for freight traffic through the Gotthard tunnel.

The «Elefant» office building is a prolongation of the series of historical workshops. Its affiliation with industrial buildings is evident in its scale and in the direct, serial design of the longitudinal façades. al buildings. The façade facing Zürcherstrasse is a listed building and will remain. New buildings are being constructed facing Lokstadt.

A multi-storey timber structure forms the basic structure for the new aluminium window and element façade. The synthesis of old and new is particularly impressive in the case of the «Elefant»: the large window fronts fit perfectly with the historic clinker brick façades from an architectural point of view.

The «Elefant building» complex includes sever-



Fig. 53 - Courtyard of «Elefant Building»



Fig. 55 - Office space of «Elefant Building»



Fig. 54 - Main entrance of «Elefant Building»



Fig. 56 - Office space of «Elefant Building»

The factory halls of the Swiss Locomotive and Machine Works (SLM) was the most important locomotive forge in Switzerland and its locomotives made railway history. As a reference to them their names are given to some of the new buildings.

The analysis of the historical structures of the factory area shows two different types of development. On the one hand, there are the large-scale workshops inside the area, and on the other, the low, street-side edge buildings in the historicism style. They were the constant, representative backdrops of the industrial production. The workshops were built and replaced, as was necessary for the construction of the respective locomotive type (for example the «Elefant»).



Fig. 57 - «Elefant Building» before renovation



Fig. 58 - Construction site of «Elefant Building»



This renovation allows the preservation of the heritage of the city. While adding a new part in the project, the renovation keeps the old façade to recall the past.

Several sustainable strategies are put in place.

The building offers many advantages such as visibility, flexibility, efficiency, productivity and modernity.



Fig. 59 - Office spaces of «Elefant Building



Fig. 60 - Interior of construction site of «Elefant Building»



HOUSE OF ADELINE FAVRE 2.3.2





Fig. 61 - Outdoor of «House of Adeline Favre»

Location:

Brownfield type:

Project type:

Date of project:

Budget:

Surface:

Katharina-Sulzer-Platz 9, 8400 Winterthur, Switzerland Abandoned building New construction Architecture Studio: Pool Architekten 2017 - 2020 _ 25'000 m² Siska Immibilien AG

Activities:

Stakeholder:

Health Department of the ZHAW (Zürich University of Applied Sciences)

Sustainable aspect:

Minergie Energy efficiency path

The Katharina-Sulzer-Platz was the centre of the foundries and thus of the Winterthur Sulzer area in general. It is characterized by the industrial character of the factory buildings made of yellow-burned bricks and the circulating crane runway. The façades with the colossal order and the crane runway give the square an impressive monumentality. The new University of Applied Sciences for Health of the ZHAW (Zürcher Hochschule für Angewandte Wissenschaften) is built on the footprint of the former building (Hall 52) and its excessive volume accentuates the large form and the historical appearance of the ensemble. The crane runway, which gives the square its distinctive, longitudinal dimension, was reassembled in its original state after completion of the construction.

This is compensated for by an atrium. A ring of circumferential galleries delimits the courtyard and, with its grid-like structured interior façade, forms a counterpart to the monumental exterior façade. V-shaped beams with skylights span the atrium. Lecture halls and practice rooms are stacked offset in the inner courtyard. This creates spacious squares and terraces that can be used as foyers and meeting areas as well as work and study areas. The various spatial relationships can be experienced via the stairs. The atrium is designed like a covered outdoor space - squares and terraces have large candelabra to create identity and are equipped with outdoor furniture.

Although the building is in one place, the school does not have its own exterior space.



Fig. 62 - Atrium of «House of Adeline Favre»



Fig. 64 - Classroom of «House of Adeline Favre»



Fig. 63 - Atrium of «House of Adeline Favre



Fig. 65 - Vertical circulation of «House of Adeline Favre»

The development of the former global company «Gebrüder Sulzer» began in 1834 with the construction of the first foundry in the large area between the old town of Winterthur and the Töss river that runs alongside the town. This founding building, as well as some other factories that were built in quick succession to the former were placed under protection after the production process was shut down.

The first part of «Hall 52» was built in 1896. Until 1927, the complex was expanded and enlarged several times. In 1960 «Hall 52» became a test bench for gas turbines. In 1993, after 33 years of activity, the test rig was shut down.

Sulzer sold the gas turbine business to Siemens and focused on diesel engines. At the end of the 20th century, «Hall 52» and the attached, even larger «Hall 53» were left empty. Until the demolition, the building was used for several temporary activities.



Fig. 66 - «House of Adeline Favre» before renovation



Fig. 67 - Demolition of «Hall 52



Key dates

Even if there was a demolition, the new building kept the footprint of the previous one by using the same outside material.

Some sustainable strategies were used. The building follows the regulation to be a Minergie building.



Fig. 68 - Entrance of «House of Adeline Favre»





2.3.3 PULS 5





Fig. 70 - Outdoor of «Puls 5»

Location:

Giessereistrasse 18, 8005 Zürich, Switzerland

Brownfield type:

Abandoned building

Renovation and new construction

Project type:

Architecture Studio:

Kyncl Gasche Partner Architects

_

-

2000 - 2004

47'000 m²

Date of project:

Budget:

Surface:

Stakeholder:

Activities:

Office spaces Housing Commercial spaces

Intershop Holding AG

Sustainable aspect:

The site is located in Zürich in the north-western corner of the former Escher Wyss site, on the perimeter of the former foundry hall. On one side the façade is oriented towards Hardturmstrasse, which determines the location.

The project consists in offices, flats and customer-intensive uses (such as shops, restaurants, events, gyms and businesses) in equal thirds. The total floor area is 44,000 square metres, of which the foundry hall alone offers 3,000 square metres of freely divisible space for events, exhibitions and congresses.

The concept envisaged the design of a structure that unites all uses as a large form, has a visually uniform effect and gives the building an expressive presence on this heavily trafficked arterial axis. The historic foundry hall integrated into the floor plan is therefore barely perceptible from the outside. It is not a listed building and was integrated into the concept of the shopping and event centre without constraint. The architects had the ambition to combine old and new, to let the past industrial age echo in the concept as well as in the materialisation and to create an architecture literally «integrated into the context with an extraordinary ambience for demanding users». The building consists of seven storeys and a parking lot in the basement. It runs around a courtyard in the manner of a rectangular perimeter block development, whereby one of the corners is volumetrically not closed.



Fig. 71 - Outdoor of «Puls 5»



Fig. 73 - Courtyard of «Puls 5»



Fig. 72 - Entrance of «Puls 5



Fig. 74 - Commercial space of «Puls 5»

The architecture of «Puls 5» relates to the history of the previous buildings. Although not a listed building, the foundry hall built in 1898 was left in the centre of the project.

More than a hundred years ago, industrial companies built their new factories in the Zurich-West quarter, and Escher Wyss & Cie, specializing in machine tool construction, built the foundry hall in 1898. Until the end of the industrial age, iron was cast and processed here. After the blast furnaces were shut down in 1975, the hall served as a warehouse and workshop for around 30 years.

Since many industrial companies stopped operating, the district has been filled with new life. What initially began hesitantly with illegal clubs and bars is now happening in an orderly and determined manner.



Fig. 75 - Façade of «Puls 5» before renovation



Fig. 76 - «Puls 5» warehouse and workshop before renovation



- end of renovation

- start of renovation

Even if the old foundry hall was not listed, the architectural team decided to preserve the old building as part of history of the city.

The previous industrial district was given a new life with new activities. «Puls 5» became a new pole in the district where people can meet.



Fig. 77 - Commercial space of «Puls 5»



SIHLCITY 2.3.4





Location:

Fig. 79 - Outdoor of «Sihlcity»

Abandoned buildings

Brownfield type:

Project type:

Architecture Studio:

Theo Hotz Partner Architekten

Renovation and new construction

626'000'000 CHF (basic expansion)

Immobilienfonds Credit Suisse

Kalanderplatz, 8045 Zürich, Switzerland

Date of project:

2003 - 2007

100'000 m²

Budget:

Surface:

Stakeholder:

Activities:

Shopping centre Entertainment centre

Sustainable aspect:

44

The site of the former Sihl paper mill in Zürich is characterised by its island location between the riverbed, high-speed roads and railway line. With the «Sihlcity» development, the 42,000m² site was made accessible to the public. The result is a district with 100'000m² of multifunctional use, which is optimally connected to public transport and gives the heterogeneously structured city district its urban centre. Existing buildings that could be used sensibly and economically were preserved, carefully renovated and interwoven with new buildings to form an inner-city guarter. The approximately 12-metre-high old buildings are defined as the plinth. Above and next to them, new volumes are layered up to a total height of 25 metres.

A sequence of public squares forms the centre of «Sihlcity». At the centre is the Kalanderplatz with the brick industrial building from the turn of the 19th century and its emblematic high chimney. Already in the preparation of the master plan, the high-quality demand on the public space was in the foreground; «Sihlcity» has a centre function within a heterogeneous environment.

The outdoor space remains permeable towards the Sihl. The difficult situation with the river space overlooked by the motorway was consciously incorporated into the outdoor space concept and upgraded with various interventions, such as art on the building and the river staircase.



Fig. 80 - Outdoor of «Sihlcity»



Fig. 82 - Entrance of «Sihlcity»



Fig. 81 - Courtyard of «Sihlcity»



Fig. 83 - Chimney in the courtyard of «Sihlcity»

In 1836, the «industrialists and bankers from local Zurich families founded the mechanical paper factory. (...) The factory started paper production with around 100 workers. Sales volumes continued to rise, additional machines were bought in and the premises kept on growing. The company was heavily affected by the world economic crisis of 1931. (...) In 1973, the flourishing company built the world's biggest machine for transparent paper. But things went downhill in the recession that followed the oil crisis: there was partial unemployment and many machines were shut down; only the Ausrüsterei (sheeting and packaging centre) continued, up until 1990. The paper company then went very quiet apart from a few halls and workshops that were rented out for occasions or to artists and small businesses.»¹³

13 *History.* (n.d.). Sihlcity. Retrieved 2 September 2021, from https://sihlcity.ch/en/history



Fig. 84 - «Sihlcity» before renovation



Fig. 85 - «Sihlcity» paper factory

Key dates

1836
- construction of the
paper factory1931
- the factory slowed
down due to the world
economic crisis1973
- construction of the
world's biggest machine
for transparent paper20072003until 1990

- end of the renovation and new construction

- start of the renovation and new construction

- only one machine was still working

(1)

«Sihlcity»

plan out of scale

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The new complex kept what was possible from the old paper factory and where it was not possible created a new construction.

Allmendst

source: Mapbox | Studio. (n.d.). Mapbox. Retrieved 1 September 2021, from https://www.mapbox.com/mapbox-studio



Hügelstrasse

Sihlhoc

2.3.5 622 HALL





Fig. 88 - Outdoor of «622 Hall»

Renovation

ABB Switzerland

Abandoned building

Location:

Therese-Giehse-Strasse 10, 8050 Zürich, Switzerland

Brownfield type:

Project type:

Architecture Studio:

Date of project:

2017

Budget: 6'000'000 CHF

Surface:

Stakeholder:

Activities:

Concert hall Catering spaces

MAAG Music & Arts AG

4'200 m²

Sustainable aspect:

Wooden construction for the extension of the concert hall

This site located in Zürich was converted from a factory into a multifunctional concert and event hall managed by MAAG Music & Arts AG.

Expomobilia was the general contractor responsible for the entire project, from planning to feasibility studies, manufacturing and assembly. The tracks, ventilation systems, offices, walls and production equipment were removed from the former industrial hall to allow for the installation of the heating, ventilation and fire protection systems, and piping.

The original shape of the hall has been retained with a wooden shell, of caisson, built inside it. The wooden box extension (13 metres high, 23 metres wide and 70 metres long), consisting of pillars and laminated wood beams with multi-layered wooden panel elements, acting as both a decorative element and a sound insulator.

The caisson concept has ensured the multi-functionality of the site while preserving the character of the hall. Many elements have been retained in the spirit of industrial chic. The gallery on the first floor is another special feature. With 312 seats, it is located on a telescopic platform that can be retracted when not required. The sanitary facilities as well as the catering and backstage areas are placed in containers, which are mobile and temporary like the whole site.



Fig. 89 - Event space of «622 Hall»



Fig. 91 - Concert hall of «622 Hall»



Fig. 90 - Concert hall of «622 Hall»



Fig. 92 - Event space of «622 Hall»

The «622 Hall» was an old industrial warehouse. Until 2012 it was used for the production of high-voltage switchgear. After a complete refurbishment in autumn 2016, the former factory reopened in February 2017 transformed into a multifunctional concert and event hall managed by MAAG Music & Arts AG.



The renovation had the goal to keep the maximum of the old industrial building in order to keep the history of the place.

The venue has been equipped with state-ofthe-art technology to host mega-concerts in Zürich. The place became a new meeting point where people can get together.



Fig. 93 - Concert hall of «622 Hall»



source: Mapbox | Studio. (n.d.). Mapbox. Retrieved 1 September 2021, from https://www.mapbox.com/mapbox-studio

2.4 UNITED KINGDOM2.4.1 PENNINGTON STREET WAREHOUSE

Location:	<image/>
	Unit 5, The Rum Warehouse, Pennington St, London E1W 2AP, United Kingdom
Brownfield type:	Abandoned building
Project type:	Renovation
Architecture Studio:	JTP architects masterplanners placemakers
Date of project:	2014 - 2019
Budget:	-
Surface:	1'400 m²
Stakeholder:	JTP architects masterplanners placemakers
Activities:	Architecture studio
Sustainable aspect:	VOC-free environment (Volatile Organic Compounds, indoor air is free of any chemicals) BREEAM (Building Research Establishment Environmental Assess- ment Method», it is the method for assessing the environmental performance of buildings) «Very good» rating

The «Pennington Street Warehouse» is located in London. «The Pennington Street Warehouse scheme is part of an overall masterplan to open up Pennington Wharf for the first time in over two centuries, and JTP Architects are among its first new tenants. They sensitively restored the grade II-listed building's brick-vaulted interior to provide them with an airy, multi-level new workplace that preserves and draws out the unique character of this historic rum and spices warehouse.

The journey from the street takes you deep inside to a space filled with light, activity, and energy. At its heart is a three-storey atrium where events, staff dining and collaborative client workshops take place amid the buzz of the surrounding studio. The office has a wide variety of shared informal spaces, meeting rooms, co-working booths, and intimate client areas set within the historic brick fabric, while the open air studio seems to levitate within the three-storey steel and timber void. The wayfinding graphics are subtle and contemporary but playfully rendered as original remnants. Juxtaposing old and new is inherently beautiful, especially when, as has happened here, light, material and structure have been so well layered. Light filters into the heart of the space from the rooflight, reflected and diffused by the timber structure set against the neutral brick vaulted space. The alterations create one big, open atrium with no walls or distant views, all carefully woven together by the workplace that surrounds it.

The low-energy project is a good use of an existing structure where the building's whole lifecycle had been thought through. In particular, the materials have been carefully researched and subject to a cradle-to-grave analysis, resulting in a low-impact, VOC¹⁴-free environment.»¹⁵

14 Volatile Organic Compound (these compounds are emitted gases that impact on the indoor quality)
15 Pennington Street Warehouse. (n.d.). RIBA Architecture.Com. Retrieved 16 September 2021, from https://www.architecture.com/awards-and-competitions-landing-page/awards/riba-regional-awards/riba-london-award-winners/2021/pennington-street-warehouse



Fig. 96 - Atrium of «Pennington Street Warehouse»



Fig. 98 - Office space of «Pennington Street Warehouse»





Fig. 99 - Interior of «Pennington Street Warehouse»

«The 200-year-old building was designed by the Dock's surveyor, engineer David Alexander, and constructed in phases between 1804-1806, the Grade II Listed Pennington Street Warehouse (PSW) was originally used to store fortified luxury commodities such as ivory, spices, coffee and cocoa as well as wine, spirits and wool. Aside from partial reconstruction of the roof following WWII bomb damage, the warehouse was largely unaltered when the Dock closed in 1969. The site was purchased by News International in 1979 and was home to The Times, Sunday Times, The Sun and the News of the World for almost 30 years.»¹⁶ RUM ROOM

Fig. 100 - «Pennington Street Warehouse» remaining traces of previous use



16 fotohaus :: architectural photographers / architectural image library / Bristol / London / Berlin - Pennington Street Warehouse, London. (n.d.). Fotohaus. Retrieved 16 September 2021, from <u>https://</u> portfolio.fotohaus.co.uk/pennington-street-warehouse-london

Fig. 101 - Bicycles parking of Pennington Street Warehouse



This renovation allows the preservation of the heritage of the city.

Sustainable strategies are put in place in order to create a healthier workspace for the people.



Fig. 103 - Construction detail of «Pennington Street Warehouse» office spaces conference rooms The Hwy The Hwy Artichoke Hill Virginia St Pennington St Pennington St (1)«Pennington Street Warehouse» 1 plan out of scale . source: *Mapbox* | Studio. (n.d.). Mapbox. Retrieved 1 September 2021, from <u>https://www.mapbox.com/mapbox-studio</u>

2.4.2 DUNDASHILL

an formation	
	Fig. 104 - Outdoor space of «Dundashill»
Location:	Dundashill, Glasgow, G4 9UE, United Kingdom
Brownfield type:	Abandoned land
Project type:	Renovation and new construction
Architecture Studio:	Rankin Fraser HTA Architects
Date of project:	2016 - ongoing
Budget:	120'000'000 £
Surface:	27 acres = 109'265 m²
Stakeholder:	Scottish Canals BIGG Regeneration
Activities:	Housing Public spaces (green spaces and commercial spaces)
Sustainable aspect:	Low carbon living Empowering the community

«Dundashill is a former distillery site of approximately 27 acres located in the Port Dundas area of Glasgow, immediately north of the city centre. The neighbourhood is fast gaining prominence as an alternative, creative destination where urban adventure activities blend with a strong arts and cultural presence.

The growth of a new community will be supported by a kick-starter programme, curated by a local community interest company set up to explore and promote social approaches to city development.

The 600-home masterplan prepared for Dundas Hill provides an opportunity for high density, urban housing focused on the strong design-led identity of the city. Delivery has commenced with a £5.7m package of site enabling works and with funding support from Glasgow Region City Deal, which completed in August 2019.

Construction of housing is due to commence in 2021, with a local housing association in line to deliver affordable homes built to Passivhaus standard. BIGG Regeneration, a joint venture between Scottish Canals and Places for People Capital, will deliver the first homes for sale on the site, building on the success of its nearby Maryhill Locks development.»¹⁷

17 *igloo Regeneration* | *Dundashill, Glasgow.* (n.d.). Igloo Regeneration. Retrieved 2 September 2021, from <u>http://www.iglooregeneration.</u> <u>co.uk/portfolio_page/dundas-hill-glasgow/</u>



Fig. 105 - Outdoor space of «Dundashill»



Fig. 107 - Outdoor space of «Dundashill»



Fig. 106 - Outdoor space of «Dundashill»



Fig. 108 - Outdoor space of «Dundashill»

«The City of Glasgow in Scotland has a distinctive topography shaped by glaciation that left behind a series of drumlins. DundasHill (also known as 100 Acre Hill) is one of the highest glacial drumlins that give Glasgow its distinctive character and urban form. The site for this regeneration project lies immediately to the north of the city centre, close to the 18th C Forth and Clyde Canal that was for many years the main transport route for industrial goods to and from the city. The site accommodated a series of industrial uses, including iron foundries, oil works, grain works, flour mills, chemical works and more recently whisky distilleries. The last whisky distillery closed in 2011 and the building were demolished leaving a series of large level terraces and the remnants of former buildings and woodland planting.»18

18 DundasHill Landscape and Public Realm Infrastructure « Landezine International Landscape Award LILA. (n.d.). Landezine International Landscape Award. Retrieved 2 September 2021, from https://landezine-award.com/dundashill-landscape-and-public-realm-infrastructure/



Fig. 109 - Whole «Dundashill» area



Fig. 110 - «Dundashill» before renovation

Key dates

before 2011

- the site welcomes several industrial uses **2011** - the last whisky distillery closed **2016** - start of the design phase of the project

2021 - start of the housing construction

2019 - end of the construction of the landscape phase



The project intends to include the community to develop the neighbourhood, to create «a vibrant area for people to live, work and visit».

Several sustainable strategies are put in place. For example, an innovative SUDS (Sustainable Drainage Systeme) network of swales, rain gardens and basins expressed in the public realm. Or a new 'canal' on the southern edge of Plot 1 that plays a key role in managing the surface water drainage via a smart technology activated drainage connection allowing storm water to discharge into the Forth and Clyde Canal.







Fig. 112 - Volumetry of the project of «Dundashill»



2.4.3 BELLGROVE MEAT MARKET SITE





Duke St / Bellgrove St, Glasgow G31 1SZ, United Kingdom

Location:

Brownfield type:

Project type:

Architecture Studio:

JTP architects masterplanners placemakers

Abandoned land and abandoned building

Renovation and new construction

2,25 hectare = 22'500 m²

Fig. 113 - «Bellgrove Meat Market Site» before renovation

Date of project:

2017 - ongoing

42'000'000 £

Surface:

Budget:

Stakeholder:

Activities:

Housing Commercial spaces Office spaces Green spaces

Home Group

Sustainable aspect:

Including electric vehicle charging spaces High-quality, sustainable residential dwellings

«Forming part of the Glasgow City Council (GCC) Meat Market masterplan, the 2.25 hectare site is being transformed with a residential proposal of 252 dwellings and a ground-level commercial unit. 20 of the new homes will be wheelchair accessible and located on the ground floor.

The Meat Market masterplan aims to extend the ribbon of development and connectivity between the city centre and the east end. The delivery seeks to focus on the regeneration of large areas of Glasgow and bring new life to the city by creating new infrastructure, offices, jobs and homes.

Situated immediately south-west of the Dennistoun Conservation Area, the area has special architectural and historical significance with origins of the cattle market dating back to the early 19th century. Collaborating closely with GCC, an architectural and landscape design has been carefully interwoven to ensure the new community includes quality public realm and green space within the site and the surrounding area.»¹⁹

19 JTP Architects, Masterplanners and Placemakers. (n.d.). *Meat Market, Glasgow.* Retrieved 2 September 2021, from <u>https://www.jtp.</u> <u>co.uk/projects/meat-market-glasgow</u>



Fig. 114 - «Bellgrove Meat Market Site» before renovation





Fig. 116 - «Bellgrove Meat Market Site» before renovation



Fig. 117 - «Bellgrove Meat Market Site» before renovation

«The B-listed Glasgow Meat Market was established in 1879 and initially housed an inn, sheds and accommodation for sheep, bullocks and other livestock. The Meat Market was one of the last remaining markets in the country and closed in the 1980s.

The New Glasgow Abattoir then stayed open until 2001 and was finally demolished in 2007. Since then, with the exception of the residential development in the southern part off of Gallowgate, the site has lain vacant.»²⁰

20 O'Neill, C. (2019, November 27). Plans to transform historic Bellgrove Meat Market with 250 flats given green light. GlasgowLive. Retrieved 2 September 2021, from <u>https://www.glasgowlive.co.uk/news/glasgow-news/plans-transform-histor-</u>

ic-bellgrove-meat-17326207



Fig. 118 - Shed for livestocks at «Bellgrove Meat Market Site»



Fig. 119 - The «Bellgrove Meat Market Site» former car market



+

The empty space will be use and will create a continuity with the other parts of Duke Street.

The heritage of the meat market is preserved by the regeneration of the place.



Fig. 121 - Plan project of -Bellgrove Meat Market Ster

network of cross

2.4.4 **EDINBURGH PRINTMAKERS**





Castle Mills, 1 Dundee St, Edinburgh EH3 9FP, United Kingdom

Location:

Fig. 122 - Outdoor of «Edinburgh Printmakers»

Renovation and new construction

Abandoned building

Brownfield type:

Project type:

Architecture Studio:

Page\Park

2019

11'000'000 £

Edinburgh Printmakers

2'675 m²

Date of project:

Budget:

Surface:

Stakeholder:

Activities:

Eight creative industries units, large print studio Exhibition spaces Shop Café, bar

Sustainable strategies:

Re-use of the old materials and re-purpose them
«The Edinburgh Printmakers creative hub is located within the former headquarters of the North British Rubber Company (NBRC). Our project involved the redevelopment of this derelict building into a multi-use arts complex centred around printmaking production.

Central to the architectural concept was to make precise interventions to facilitate new use while respecting the character and story of the existing building. (...)

New architectural elements are light of touch and stem from an understanding of the heritage. The bold new entrance onto Dundee Street provides a public face for Edinburgh Printmakers, offering views from the street directly into the galleries, reception and shop. heart of the building to create a central courtyard around which all building users can meet and interact. The print studio sits at first floor in the triple-height former fitting and turning workshop. Our approach was not to whitewash the many stories of this space, but instead to allow a new layer of occupation that adds to its ongoing narrative.»²¹

The new extension to the rear subtly shifts the

21 Page \ Park. (n.d.). *Edinburgh Printmakers - Page Park*. Retrieved 2 September 2021, from <u>https://pagepark.co.uk/project/architecture/</u> <u>edinburgh-printmakers/</u>



Fig. 123 - Entrance of «Edinburgh Printmakers»



Fig. 125 - Catering space of «Edinburgh Printmakers»



Fig. 124 - Outdoor of exhibition space of «Edinburgh Printmakers»



Fig. 126 - Vertical circulation of «Edinburgh Printmakers»

«The North British Rubber Company (NBRC) Office Building is the only surviving element of a once large and important 19th century industrial complex in Edinburgh which was internationally renowned at the height of its industrial output, exporting products around the world. Its most significant contributions to industry include the production of both the vulcanised tyres in 1875 and the invention of detachable pneumatic tyres in 1890, the forerunner of modern tyres. The company was also highly significant for producing high guality rubber boots for World War One and various rubber based products for combat in the Second World War. At its height, it was the largest industrial site in Edinburgh, occupying over 20 acres and employing over 3,000 people.»22

22 Page \ Park. (n.d.). *Edinburgh Printmakers - Page Park*. Retrieved 2 September 2021, from <u>https://pagepark.co.uk/project/architecture/edinburgh-printmakers/</u>



Fig. 127 - «Edinburgh Printmakers» before renovation



Fig. 128 - Workshop of the former North British Rubber Company

Key dates



- completion of the project

- post North British Rubber Company use

+

The preservation of a large part of the former building insures the maintenance of the heritage of the city.

The re-use of some materials of the former building is a major sustainable aspect. In fact, it is a key point in the life cycle of a building.



Fig. 129 - Façade of «Edinburgh Printmakers»



2.5 BELGIUM2.5.1 BOIS DU CAZIER SITE





Fig. 131 - Outdoor of «Bois du Cazier Site»

Location:

Rue du Cazier 80, 6001 Charleroi, Belgium

Abandoned land and abandoned buildings

Brownfield type:

Project type:

Architecture Studio:

Date of project:

Budget:

Surface:

24'264 m² (this number was found by measuring on the map)

Stakeholder:

Activities:

Museums, memorial Café, restaurant Centre of events Shop

_

Region Wallonne

Renovation

1998 - 2007

15'769'078.84 €

Sustainable aspect:

«Bois du Cazier Site» is located in Charleroi. In 1998, the Walloon Region assigned IGRETEC (Intercommunale pour la Gestion et la Réalisation d'Etudes Techniques et Economiques) and its various trades the task of bringing this emotionally charged site back to life. IGRE-TEC was therefore appointed as the delegated project manager and design office for the restoration of this listed site.

Architecture, stability, special techniques, site coordination, environment, road development, delegated project management, etc. were all involved in bringing this emblematic site of the region back to life.

The work was carried out in two phases, divided between the listed and unlisted buildings, which were given a new purpose.

Although the first phase of the work was



Fig. 132 - Entrance of «Bois du Cazier Site



Fig. 134 - Exhibition space of «Bois du Cazier Site»



completed in 2002, when it was opened to

the public, the most significant phase in the

minds of the inhabitants of Charleroi was un-

doubtedly the destruction of the Foraky Tower

on 16 April 2004. This tower was demolished in order to make way for the other phases of

In 2007, 40 years after the closure of the site, the renovation work was completely finished,

making way for a place of remembrance and

tourism attracting more than 50,000 visitors

renovation of the site.

per year.

Fig. 133 - Entrance building of «Bois du Cazier Site»



Fig. 135 - Memorial of «Bois du Cazier Site»

The origin of the name «Bois du Cazier» comes from the union of the owner of the «Bon Bois» in Marcinelle with the Baron de Cazier in the 18th century. The woods were then referred to as «Bois de Cazier». The name then evolved into «Bois du Cazier».

As early as 1822, a coal mine was being exploited there, but it was not until 1874 that the coal mine took the name of «Bois du Cazier». After being bought out by the Charbonnages d'Amercoeur in 1899, the Cazier became one of the most productive and modern collieries in the Charleroi region.

Nevertheless, the site experienced two major disasters during its activity: in 1930, 16 miners died as a result of a firedamp explosion and in 1956 a fire breaks out and 262 miners did not return. The «Bois du Cazier» ceased its operations for good on 9 December 1967, after 145 years of activity.



ig. 136 - «Bois de Cazier Site» before renovatior



Fig. 137 - Fire in the mine of «Bois du Cazier Site»



The renovation of the site allows to preserve the heritage of the old mine buildings. The site has so much history that a memorial was created in memory of the disaster that happened in 1956.

The renovation also enables to bring more people to the place and increase the tourism in the region.



Fig. 138 - Sketch of «Bois du Cazier Site»



Fig. 139 - Overview of «Bois du Cazier Site»



source: Mapbox | Studio. (n.d.). Mapbox. Retrieved 1 September 2021, from https://www.mapbox.com/mapbox-studio

2.6 GERMANY2.6.1 DUISBURG NORD LANDSCAPE PARK





Fig. 140 - Outdoor of «Duisburg Nord Landscape Park»

Emscherstraße, 47137 Duisburg, Germany

Abandoned land and abandoned buildings

Renovation

Latz+Partner

1990 - 2002

Architecture Studio:

Date of project:

Budget:

Location:

Brownfield type:

Project type:

Surface:

Stakeholder:

Landesentwicklungsgesellschaft Nordrhein-Westfalen Stadt Duisburg Emschergenossenschaft Essen

Kommunalverband Ruhrgebiet

 $200 \text{ hectares} = 2'000'000 \text{ m}^2$

Activities:

Green spaces Leisure, recreation and sport (diving, climbing and hiking)

Sustainable aspect:

The landscape park Duisburg Nord is built on the previous Meiderich metallurgical plant. «With some 100 projects, the International Building Exhibition Emscher Park (IBA) in the Ruhr District was attempting to set quality building and planning standards for the environmental, economic and social transformation of an old industrialised region. The landscape park Duisburg Nord is one of these projects. The idea was to integrate, shape, develop and interlink the existing patterns that were formed by its previous industrial use, and to find a new interpretation with a new syntax. The existing fragments were to be interlaced into a new «landscape».

In the landscape park Duisburg Nord, individual systems operate independently, such as the low-lying water park, the single fields and clumps of vegetation, the promenades at street level connecting parts of the town which were separated for decades, and the railway park with its high level promenades and the rail harp. They connect only at certain points through specific visual, functional or merely imaginary linking elements.

Created collectively as an artwork by engineers, the rail harp reflects the centennial history of the place. The huge land art slowly emerged again due to a cautious vegetation management with the help of the gardeners.»²³

23 Latz+Partner. (n.d.). Duisburg Nord Landscape Park, DE. Retrieved 3 September 2021, from https://www.latzundpartner.de/en/projekte/ postindustrielle-landschaftspark-duisburg-nord-de/



Fig. 141 - Outdoor of «Duisburg Nord Landscape Park»



Fig. 143 - Parklands of «Duisburg Nord Landscape Park»



Fig. 142 - Power plant of «Duisburg Nord Landscape Park»



Fig. 144 - Parklands of «Duisburg Nord Landscape Park»

The construction of the Meiderich metallurgical plant started in 1901. Until 1912 all five blast furnaces were put in place and ready to operate. Until the 1930's, the demands were reduced due to different crisis. From 1933, the armament of the 3rd Reich led to an upswing in the iron and steel industry. In the second half of the 1930s, capacity utilization increased from 60 to up to 90 percent. In 1945, the victorious powers confiscated all iron and steel works. As reparation for the destruction caused by Germany during the war, the dismantling of entire industrial plants was planned. The Meiderich factory, however, was rebuilt as it was not on the dismantling list. It received the production permit for the commissioning of two blast furnaces. In 1985, the factory was shut down. In 1990, the works for the renovation started and finished completely in 2002.







Fig. 146 - Outdoor of «Duisburg Nord Landscape Park»



The transformation of an old factory into a leisure park ensure to keep the heritage of the place.

The site became a new meeting point with several activities. It attracts more people and brings life to this area.



Fig. 147 - Outdoor of «Duisburg Nord Landscape Park»



Fig. 148 - Furnaces of «Duisburg Nord Landscape Park»



2.6.2 ELBPHILHARMONIE





Fig. 149 - Overview of «Elbphilharmonie»

Renovation and new construction

Location:

Platz d. Deutschen Einheit, 20457 Hamburg, Germany

Brownfield type:

Project type:

Architecture Studio:

Herzog & de Meuron

2006 - 2016

900'000'000 €

125'512 m² (GFA)

Abandoned building

Date of project:

Budget:

Surface:

Stakeholder:

Freie und Hansestadt, represented by ReGe Hamburg Project-Realisierungsgesellschaft mbH

Activities:

Philharmonic hall, chamber music hall Restaurants, bars, panorama terrace Housing, hotel, parking

Sustainable aspect:

Openings in superstructure allowing views on River Elbe Important acoustic work to combine music public spaces with private spaces

The «Elbphilharmonie» on the «Kaispeicher» was originally built as a storage facility. It «marks a location that most people in Hamburg know about but have never really noticed. It is now set to become a new centre of social, cultural and daily life for the people of Hamburg and for visitors from all over the world.

Too often a new cultural centre appears to cater to the privileged few. In order to make the new Philharmonic a genuinely public attraction, it is imperative to provide not only attractive architecture but also an attractive mix of urban uses. The building complex accommodates a philharmonic hall, a chamber music hall, restaurants, bars, a panorama terrace with views of Hamburg and the harbour, apartments, a hotel and parking facilities. These varied uses are combined in one building as they are in a city. And like a city, the two contradictory and superimposed architectures of the Kaispeicher and the Philharmonic ensure exciting, varied spatial sequences: on the one hand, the original and archaic feel of the Kaispeicher marked by its relationship to the harbour; on the other, the sumptuous, elegant world of the Philharmonic. In between, there is an expansive topography of public and private spaces, all differing in character and scale: the large terrace of the Kaispeicher, extending like a new public plaza, responds to the inwardly oriented world of the Philharmonic built above it.»²⁴

24 Herzog & de Meuron. (n.d.). 230 ELBPHILHARMONIE HAMBURG - HERZOG & DE MEURON. Retrieved 4 September 2021, from https://www.herzogdemeuron.com/index/projects/complete-works/226-250/230-elbphilharmonie-hamburg.html



Fig. 150 - Overview of «Elbphilharmonie»



Fig. 152 - Philharmonic hall of «Elbphilharmonie»



Fig. 151 - Overview of «Elbphilharmonie»



Fig. 153 - Rooftop of «Elbphilharmonie»

A true-to-original reconstruction of the «Kaispeicher» did not make economic sense after the war. The building was blown up in 1963, much to the regret of many Hamburg residents. The «Kaispeicher A» is rebuilt according to a design by Werner Kallmorgen and completed in 1966 after three years of construction. The tapering shape of the building is particularly striking. Dock workers toil here day in and day out, mainly to stack sacks of cocoa inside the building. That is why the «Kaispeicher A» is popularly known as the «Kakobunker».

But soon the warehouse was considered out dated. The passages between the support pillars are too narrow for forklifts: The «Kaispeicher A» is therefore not suitable for palletized goods. And in the age of container shipping, there is hardly any need for huge warehouses. The building will continue to be used sporadically until spring 2001.



Fig. 154 - Initial «Kaiserspeicher Building



Fig. 155 - «Kaispeicher A Building»



The «Elbphilharmonie» became a landmark visible from afar.

The heritage of the city is preserved. In fact, the whole exterior of the building is kept and overcome by the new glass structure on top.

An exceptionally long escalator through the building allows to have an overview on the old and the new parts of the construction.

The budget of this huge project went from 115millions to 900millions Euro.

The construction site suffered many delays.



Fig. 156 - Façade of «Elbphilharmonie»



Fig. 157 - Exceptionally long escalator of «Elbphilharmonie»



2.7 ITALY2.7.1 OFFICINE GRANDI RIPARAZIONI (OGR)





Fig. 158 - Outdoor of «OGR»

Location:

Corso Castelfidardo 22, 10138 Turin, Italy

Brownfield type:

Abandoned building

Renovation

2013 - 2017

100'000'000 €

35'000 m²

Project type:

Architecture Studio:

FOR Engineering Architecture Bp + p Architecture & Design

Date of project:

Budget:

Surface:

Stakeholder:

Fondazione CRT

-

Activities:

Museum, exhibition spaces Research & technology centre Office spaces, co-working spaces Catering spaces, relax areas

Sustainable strategies:

The complex «Officine Grandi Riparazioni» (OGR) is included in the urban quadrant of Turin known as Spina 2, which is characterised by a major urban redevelopment operation following the construction of the railway link. The main objective of the redevelopment project with over 35,000 square metres of recovered space is to create a strategic asset for the development of culture and leisure time in the city.

This historic place rediscovers its authentic beauty, redefining its function through design, creativity and visual arts. It is a new centre of attraction, which preserves intact the memory of the past and becomes an outpost of the future.

The redeveloped building is called «H-shaped» because its floor plan consists of two long parallel sleeves (North and South Workshops)

connected transversely by a third, lower block (joint). The two sleeves and the transept will host distinct uses, but will interact and coexist.

The historic masonry of the existing state was never affected or modified and the internal interventions never compromised it.

A project was developed that includes highly innovative and technological interventions, aimed at offering maximum usability of the spaces by the users.

The complex hosts a number of high-profile cultural and social activities that are not currently located in the metropolitan area and that are necessary in order to constitute, as the objective of the refunctionalisation foresees, an attractive centre that can be used beyond the usual office hours.



Fig. 159 - Exhibition space of «OGR»



Fig. 161 - Exhibition space of «OGR»



Fig. 160 - Exhibition space of «OGR»



Fig. 162 - Catering space of «OGR»

«For over a hundred years the OGR - «Officine Grandi Riparazioni», an imposing late XIX century industrial complex drove the town's growth. Abandonment and dereliction ensuing the early 1990s closure, led to their planned demolition, luckily averted. In 2013, the «Fondazione CRT» purchased the 20'000m² H-shaped building, the offices and the yards and, through «Società OGR-CRT», their redevelopment began.»²⁵





Fig. 164 - Interior of «OGR» before renovation

25 From workshop for trains to workshop for ideas. (n.d.). OGR Torino. Retrieved 4 September 2021, from <u>https://ogrtorino.it/en/</u> project

Key dates

1895 1944 1992 - opening of «OGR», a - during WWII the com-- the building closed major repair workshops plex had important for rail vehicles damages 1995 2013 2008 - restoration and rede-- exhibition are taking - the demolition of place in «OGR» «OGR» were averted velopment start

2017

- the new «OGR» open

The complex «OGR» became a new pole of attraction. It is a place that attracts people and brings life to the area.

Thanks to the renovation the heritage of the place is preserved.



Fig. 165 - Exhibition space of «OGR»



Fig. 166 - Exhibition space of «OGR»



2.7.2 BASE CULTURAL CENTRE





Fig. 167 - Outdoor of «BASE Cultural Centre»

Location:

ig. for Catacor of Erice Catara Control

Via Bergognone, 34, 20144 Milan, Italy

Brownfield type:

Abandoned building

Renovation

Onsitestudio

2015 - 2019

8'600'000€

11'000 m²

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Project type:

Architecture Studio:

Date of project:

Budget:

Surface:

Stakeholder:

Comune di Milano, Arci Milano, Avanzi, esterni, h+, Make a Cube, Fondazione Cariplo, OXA

Activities:

Hostel Co-working space, meeting rooms, auditorium Restaurant, bar Event spaces (theatre, concert area)

Sustainable aspect:

The project concerns the redevelopment of the former Ansaldo building, along via Tortona in Milan, as part of the urban regeneration of the entire area. The other polarities of the large urban block are the Scala studios, the Colla puppet theatre-museum, the MUDEC and part of the municipal offices.

«BASE Cultural Centre» of Milano is a composition of different functions, a sort of Milanese «Fun Palace» housed in the industrial buildings belonging to the former Ansaldo factory, initially located on the outskirts of the city, now completely surrounded by buildings.

Because of the scale of the intervention, the project cannot be considered solely as a hidden interior in an existing structure. The focus of the intervention is on the search for a relationship between a large, empty industrial space and a constellation of new services and facilities, some of which consist of independent volumes. The intervention in the former Ansaldo building proposes a contemporary reflection on the meaning and form of cultural institutions: in particular, the intervention deals with a large «open» building, not locked in a single form, but at the service of the flexibility of programmes and different activities, prepared to host multiple scenarios. The attempt is in fact to create a sort of scenographic palimpsest in which activities, people and their processes move. In this sense the project aims to make the building radically public, not only in the interpretation of the programme, but also and above all in its spatial conception. Additionally, the architectural interventions combine with this objective the desire to maintain the extraordinary spatial qualities already existing, the fascinating atmosphere and tone conferred by the materials, proportions, lights and strong industrial character.



Fig. 168 - Event space of «BASE Cultural Centre



Fig. 170 - Catering space of «BASE Cultural Centre»



Fig. 169 - Co-working space of «BASE Cultural Centre»



Fig. 171 - Meeting room of «BASE Cultural Centre»

The original Ansaldo industrial complex of about seventy thousand square metres between via Stendhal, via Tortona and via Bergognone dates back to 1904, when the company Zust, then A.E.G. and later Galileo Ferraris wanted to set up their plants. In the 1960s, Ansaldo was established to produce trams, locomotives and railway carriages.

The area of the factory was purchased by the Milan City Council in 1990 with a restriction on its use for cultural services. On an urban scale, the aim was to create an alternative pole to the city centre, in an area with few public services, but with a wealth of abandoned industrial areas and therefore possible sites for redevelopment.



Fig. 172 - Interior of «BASE Cultural Centre» before renovation



Fig. 173 - Interior of «BASE Cultural Centre» before renovation

the «Teatro alla Scala»



The renovation of the Ansaldo building preserves the city heritage.

The «BASE Cultural Centre» became a new pole of attraction. It is a place that attracts people and bring life to the area.



Fig. 174 - Co-working space of «BASE Cultural Centre»



Fig. 175 - Event space of «BASE Cultural Centre»



2.7.3 NICCOLÒ PAGANINI AUDITORIUM

and	Fig. 176. Outdoor of Misselà Degeniei Autitatium.
Location:	Via Toscana, 5/a, 43121 Parma, Italy
Brownfield type:	Abandoned building
Project type:	Renovation
Architecture Studio:	Renzo Piano Building Workshop Architects
Date of project:	1996 - 2001
Budget:	-
Surface:	7'570 m²
Stakeholder:	City of Parma
Activities:	Auditorium
Sustainable aspect:	-

The Paganini Auditorium was born from the idea of transforming a disused industrial area, the historic Eridania sugar refinery located in Parma. «The old Eridiana sugar factory was an empty brick structure of just the right size and volume to be turned into a harmonious «music box». The building's walls could be retained and a process of dematerialization would seek the perfect balance between transparency and acoustics. Through this process, the decommissioned factory was turned into a new concert hall not far from Parma's city centre.

The creation of the Auditorium Paganini was an integral part of a larger plan to clean up and renew an area endowed with decommissioned factories east of the centre of Parma. An old park with fine tall trees added to the impetus for redeveloping this area and converting the rundown buildings into useful public ones.

The visual impact of the long parallel walls of the old Eridiana sugar refinery was a powerful one. They were also objects steeped in local history, laden with emotion and memories. So it was decided that the simple yet dramatic exposure of the essential structural elements of the factory - the two long main walls with their sequence of metal trusses - should become the basis of the project to convert the building into a space for music. This stripping back of the building called for the removal of the narrow front and back walls, as well as all of the transverse walls. Ancillary structures were also done away with, except a building right next to the auditorium, converted to house rehearsal rooms, dressing rooms and services for the Auditorium.»²⁶

26 Renzo Piano Building Workshop. (n.d.). *Niccolò Paganini Auditorium*. Retrieved 8 September 2021, from http://www.rpbw.com/project/niccolo-paganini-auditorium



Fig. 177 - Entrance of «Niccolò Paganini Auditorium»



Fig. 179 - Auditorium space of «Niccolò Paganini Auditorium»



Fig. 178 - Outdoor of «Niccolò Paganini Auditorium»



Fig. 180 - Glass façade of «Niccolò Paganini Auditorium»

The historic Eridania sugar refinery was active in Parma from 1899 to 1968. To transform it into a modern «sound factory», the spaces have been reinvented to eliminate the boundaries between the architectural space and the natural space of the park. It represents the most significant intervention in the redesign of one of the city's main industrial areas in the early decades of the 20th century.



Fig. 181 - «Niccolò Paganini Auditorium» before renovation



Fig. 182 - «Niccolò Paganini Auditorium» before renovation



2001 - end of the construction

Thanks to the renovation of the former building, the heritage of the city is preserved.

The auditorium became a new attraction pole of the city where people can meet and spend time together with the concert hall able to accommodate up to 780 people.



Fig. 183 - Outdoor of «Niccolò Paganini Auditorium»



2.7.4 FIRST MINT OF ITALY





Fig. 185 - Outdoor of the «First Mint of Italy»

Studio Atelier Alfonso Femia

Abandoned building

Renovation

2019 - 2021

27'000'000€

16'000 m²

Location:

Via Principe Umberto 4, 00185 Rome, Italy

Brownfield type:

Project type:

Architecture Studio:

Date of project:

Budget:

Surface:

Stakeholder:

Istituto Poligrafico e Zecca dello Stato Italiano spa

Activities:

Museum Coffee shop, restaurant Library, bookshop School of Arts and Crafts Guest house

Sustainable aspect:

92

The building of the «First Mint of Italy» located in Rome «on via Principe Umberto represents one of the key elements for the development of the area that extends itself south of Stazione Termini and which finds its centre in Piazza Vittorio Emanuele II.

The project has as its first objective the redevelopment and renovation of the existing building, emphasizing its original features which date back to the first half of the 1900s, in accordance with a re-functionalization of the internal spaces designed to accommodate the new program specified in the call.

The attitude towards the existing is based on the desire to find the identitary elements that characterized the symmetrical and composed volumetric system of the building and the "industrial" flavor of the rooms, given by the presence of large machines for processing coins and by the exposed plant system that the project maintains and emphasizes.

Therefore, the demolition of all the superfetations²⁷ – which have pervaded the roofs and concealed the clear three-court structure over the years – was foreseen, providing for the demolition and reconstruction of the top floor of the central body, with an advancement of the volume towards via Principe Amedeo, always in compliance with the limits given by local Regulations and by the constraint of historical interest on the property.

The new volume is characterized by an orderly and "delicate" architecture in its relationship with the existing one. (...)

A project that therefore aims to integrate the past, to research and rediscover the original features of the State Mint building, but always keeping in mind the future and its ability to revitalize, through the new program and spaces rich in history and value.»²⁸

27 Building addition

28 Atelier(s) Alfonso Femia AF517. (2021, September 10). *The First Italian State Mint.* Retrieved 16 September 2021, from https://www.atelierfemia.com/en/2020/04/rigualificazione-e-recupero-prima-zecca-ditalia/?noredirect=en_US



Fig. 186 - Outdoor of the «First Mint of Italy»



Fig. 188 - Catering space of the «First Mint of Italy»



Fig. 187 - Museum of the «First Mint of Italy»



Fig. 189 - Museum of the «First Mint of Italy»

The «First Mint of Italy» was inaugurated in 1911 by King Victor Emmanuel III, who was passionate about numismatics. The building was then used to produce coins and documents until 2006, when new technologies found new home in via Salaria. Instead, the giant minting machines and the lathe, the drawings and medals, the coins and the bas-reliefs have remained inside the industrial archaeology building and can now be seen in the exhibition. Inside the large rooms, photos and videos reconstruct the history and processing of unforgettable coins such as the first lira, the 500 lire silver coin and the first Euro in 2002 with Leonardo's Vitruvian man.



Fig. 190 - «First Mint of Italy» before renovation



Fig. 191 - «First Mint of Italy» before renovation



- end of the construction

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Thanks to the renovation of the former building, the heritage of the city is preserved.

The renovation transformed the place in a new cultural place. This means that it attracts more people and brings life to this area.



Fig. 192 - Conference space of the «First Mint of Italy»



Fig. 193 - Guesthouse room of the «First Mint of Italy»



3. 3 1

COMPILATION AND ANALYSES OF CASE STUDIES

3.1 CASE STUDIES OVERVIEW (data compiled by the author)

	LA SUCRIÈRE	BÂTIMENT PORCHE	CONFLUENCE MUSEUM	H7
PROJECT				
LOCATION	FRANCE LYON	FRANCE LYON	FRANCE LYON	FRANCE LYON
ACTIVITY	CULTURAL SPACE OFFICE SPACES	CULTURAL SPACE OFFICE SPACES	MUSEUM	CULTURAL SPACE OFFICE SPACES
SUSTAINABLE ASPECTS cf. for details see case studies	YES	YES	YES	YES
SQUARE METRES	11'456 m² Net Floor Area	1'600 m² Net Floor Area	26'700 m² Net Floor Area	4'083 m²
BUDGET	10'443'700 € (excluding taxes)	3'300'000 €	328'500'000 €	7'060'000 € (excluding taxes)
PRICE/m ²	912 €/m²	2'063 €/m²	12'304 €/m²	1'729 €/m²

CAOUTCHOUC HALL	HIKARI BUILDINGS	ELEFANT BUILDING	HOUSE OF ADELINE FAVRE	PULS 5
FRANCE LYON	FRANCE LYON	SWITZERLAND WINTERTHUR	SWITZERLAND WINTERTHUR	SWITZERLAND ZÜRICH
OFFICE SPACES	HOUSING COMMERCIAL OFFICE SPACES	OFFICE SPACES	UNIVERSITY	HOUSING COMMERCIAL OFFICE SPACES
YES	YES	YES	YES	NO
4'100 m ²	12'800 m ²	13'014 m² Net Floor Area	25'000 m²	47'000 m ²
6'030'000 € (excluding taxes)	60'000'000 €	102'600'000 CHF	-	-
1'471 €/m²	4'688 €/m²	7'884 CHF/m ² 7'267 €/m ² 1CHF = 0.9218 € (22.09.21)	- 1CHF = 0.9218 € (22.09.21)	- 1CHF = 0.9218 € (22.09.21)

	SIHLCITY	622 HALL	PENNINGTON STREET WAREHOUSE	DUNDASHILL
PROJECT				
LOCATION	SWITZERLAND ZÜRICH	SWITZERLAND ZÜRICH	UNITED KINGDOM LONDON	UNITED KINGDOM GLASGOW
ACTIVITY	SHOPPING CENTRE	CULTURAL SPACE	OFFICE SPACES	HOUSING PUBLIC SPACES
SUSTAINABLE ASPECTS cf. for details see case studies	NO	YES	YES	YES
SQUARE METRES	100'000 m²	4'200 m²	1'400 m²	109'265 m²
BUDGET	626'000'000 CHF (basic expansion)	6'000'000 CHF	-	120'000'000 £
PRICE/m ²	6'260 CHF/m ² 5'770 €/m ² 1CHF = 0.9218 €	1'429 CHF/m ² 1'317 €/m ² 1CHF = 0.9218 €	- 1GBP = 1.1637 € (22.09.21)	1'099 £/m ² 1'278 €/m ² 1GBP = 1.1637 €

BELLGROVE MEAT MARKET SITE	edinburgh Printmakers	BOIS DU CAZIER SITE	DUISBURG NORD LANDSCAPE PARK	Elbphilharmonie
UNITED KINGDOM GLASGOW	UNITED KINGDOM EDINBURGH	BELGIUM CHARLEROI	GERMANY DUISBURG	GERMANY HAMBURG
HOUSING COMMERCIAL OFFICE SPACES PUBLIC SPACES	CULTURAL SPACE	CULTURAL SPACE	PARK PUBLIC SPACES	CULTURAL SPACE HOUSING PARKING
YES	YES	NO	NO	YES
22'500 m²	2'675 m²	24'264 m ² (this number was found by measuring on the map)	2'000'000 m ²	125'512 m² Ground Floor Area
42'000'000 £	11'000'000 £	15'769'079€	-	900'000'000 €
1'867 £/m² 2'172 €/m² ^{1GBP} = 1.1637 € (22.09.21)	4'112 £/m² 4'785 €/m² ^{1GBP} = 1.1637 € (22.09.21)	650 €/m²	-	7'171 €/m²

	OGR	BASE CULTURAL CEN- TRE	NICCOLÒ PAGANINI AUDITORIUM	FIRST MINT OF ITALY
PROJECT				
LOCATION	ITALY TURIN	ITALY MILAN	ITALY PARMA	ITALY ROME
ACTIVITY	CULTURAL SPACE	CULTURAL SPACE	CULTURAL SPACE	CULTURAL SPACE MUSEUM
SUSTAINABLE ASPECTS cf. for details see case studies	NO	NO	NO	NO
SQUARE METRES	35'000 m²	11'000 m²	7'570 m²	16'000 m²
BUDGET	100'000'000 €	8'600'000 €	-	27'000'000 €
PRICE/m ²	2'857 €/m²	782 €/m²	-	1'688 €/m²
3.2 COMPARISON OF THE CASE STUDIES

3.2.1 ANALYSIS PRICE PER SQUARE METRES

A first analysis was made to see how the price per square metre of the projects evolves, if applicable, over the years.

The data in blue are the projects where all the information is available. The one in red is the project where it was possible to complete the data with assumption. Besides that, it must be raised that some case studies were left out²⁹ of the final analysis, because of missing data.

It is possible to distinguish three categories. The first category, from project A to K, includes the low-cost projects, which are present throughout the years with a slight variation. The second category, from project L to P, for which the prices are higher, but also spread along the timeline. These projects are slightly more expensive, because they are public buildings where not only renovation was undertaken, but also creation of a new part of the building. In the case of «Hikari Buildings» (L), which are public and private buildings, the cost is higher, because it is a completely new project that includes new technologies. And finally, the third category, corresponding to project Q, the Confluence Museum, that has an extremely high price in comparison to the other projects. As we noted previously in the description of the project, the budget was not correctly evaluated, which led to a dramatic increase of its total price.

Q. CONFLUENCE MUSEUM

29 The left out projects: House of Adeline Favre, Puls 5, Pennington Street Warehouse, Duisburg Nord Lanscape Park and Niccolò Paganini Auditorium



Chart n°1 - Price per square metre with time (data compiled by the author)

A. BOIS DU CAZIER SITE B. BASE CULTURAL CENTRE C. LA SUCRIÈRE D. DUNDASHILL E. 622 HALL F. CAOUTCHOUC HALL G. THE FIRST MINT OF ITALY H. H7 I. BÂTIMENT PORCHE J. BELLGROVE MEAT MARKET K. OGR

In T - Price per square metre with time (data complied by the author)

L. HIKARI BUILDINGS

O. ELBPHILHARMONIE

P. ELEFANT BUILDING

N. SIHLCITY

M. EDINBURGH PRINTMAKERS

102

On the chart below an analysis relating the price to the number of inhabitants was carried out. Low-cost projects were observed particularly for small towns. But, since there are higher prices for smaller cities and lower prices for bigger cities, the price per square metre seems not to be influenced by the number of inhabitants. However, the price per square metre might be impacted by the location in various countries.



Chart n°2 - Price per square metre with number of inhabitants (data compiled by the author)

On the chart below an analysis relating the price to the total square metres was carried out. Most projects have a small building surface. Among them, prices vary from low to high. For projects with a larger construction area, the prices are average. For the Dundashill project (D), the price is very low. This is due to the fact that it is a housing project, which needs less work on structure since it has regularity and repetition in terms of spaces.



Chart n°3 - Price per square metre with the total square metre (data compiled by the author)

3.2.2 ANALYSIS PER ACTIVITIES

An analysis of the case studies by activities and price per square metre was carried out. In the following graphs the projects are divided in three categories: cultural space, office

1. Cultural space - The Confluence museum is more expensive than the other projects, because as we already mentioned previously the budget of this project was not correctly evaluated. Also, the Edinburgh printmakers project cost is the double of the OGR project because it was not only a renovation. The addition of an extension caused supplementary costs.



spaces and housing. For the tree categories

there is always one project that is more ex-

pensive. We will see more precisely why.

Chart n°4 - Classification from the smallest price per square metre to the highest for cultural space projects (data compiled by the author)

2. Office spaces - The «Elefant» building is the most expensive. The addition of a new construction increased the costs.

1. «LA SUCRIÈRE» 2. CAOUTCHOUC HALL

2. OAU 3. H7

8'000

7'000

6'000

5'000

4'000

3'000 2'000 1'000

4. «BÂTIMENT PORCHE»

Chart n°5 - Classification from the smallest price per square metre to the highest for office spaces projects (data compiled by the author)

3

4

5. «ELEFANT» BUILDING

5

2

3. Housing - The Elbphilharmonie is the most expensive, because it is a complex project where they gutted the existing building, kept only the façades, creating a whole new interior and adding a structure on the top.



Chart $n^{\circ}6$ - Classification from the smallest price per square metre to the highest for housing projects (data compiled by the author)

4. TURIN AREA BROWNFIELDS AND STRATEGIC POLICIES4.1 INTRODUCTION

4.1.1 METROPOLITAN CITY OF TURIN - PAST AND FUTURE

The city of Turin was part of several urban regeneration interventions. In fact, three strategic plans were put in place during the years. All of them had the same goal: to transform, and regenerate the city from the industrial dismissed areas.

The first one started in 1995 and was published in 2000. Its aim was to convert the disused buildings into new uses. It was a physical improvement plan with the 2006 Winter Games as a milestone. At this period the second strategic plan was published. This plan was more focused on social and economic support. The third and current strategic plan was published in 2015 and has a target date in 2025. The third strategic plan aims to seize opportunities and translate them into a project for the future of metropolitan city of Turin. This one focusses on businesses and citizens. It gives concrete form to the third cycle of transformation and enabling the local economic system to offer greater opportunities for work, training, life, doing business and civil and social prosperity.

4.1.2 TRENTAMETRO INITIATIVE

The Trentametro initiative, which first purpose is to attract «investments in the metropolitan area» of Turin, «derives from the idea of recovering abandoned industrial areas within the territory of the Metropolitan City of Turin.»³⁰ «The Trentametro project (...) aims to achieve

the maximum potential on the territorial and urban level, in order to boost new productive activities and to promote the reuse of many abandoned areas of our territory.»³¹

The study first mapped all the abandoned industrial areas measuring more than 5'000 square metres. From the 130 areas, 30 were selected by taking into consideration the at-

tractiveness, the services, the surroundings and the accessibility.

The project aims to promote «the selected areas at a national and international level, in order to transform abandoned places into opportunities for economic development.»³²

4.1.3 CHOICE OF AREA

A first sorting among the sites selected for the Trentametro project was made by removing the sites without buildings.

Then, a classification by existing gross floor area was carried out to enable the comparison with the case study analysis (see subject 2. of this thesis). For this project, it was decided to compare sites with a size between 10'000 and 30'000 square metres. Among the ten areas corresponding to this criterion, three were withdrawn because they were sold and because of missing information. Four of the remaining seven areas were smaller than the other three. The larger areas were chosen to allow for more liberty in the planning part but the map of one of them was incomplete. The two remaining sites, the former Brondi and the former Pininfarina areas, were chosen, because the related maps are available and allow to carry on with the analysis work.

³⁰ Torino Metropoli - Città metropolitana di Torino. (n.d.). Progetto Trentametro - Città Metropolitana di Torino. . . . Retrieved 15 October 2021, from http://www.cittametropolitana.torino.it/cms/sviluppo-economico/attrazione-investimenti/trentametro/

³¹ Città metropolitana di Torino, LINKS Foundation, Consorzio Insediamenti Produttivi del Canavese, & Confindustria Piemonte. (2019, November). TRENTAMETRO Attraction of investments in the metropolitan area. LINKS Foundation. (p.3)

³² Città metropolitana di Torino, LINKS Foundation, Consorzio Insediamenti Produttivi del Canavese, & Confindustria Piemonte. (2019, November). TRENTAMETRO Attraction of investments in the metropolitan area. LINKS Foundation. (p.3)

4.2 URBAN ANALYSIS

4.2.1 METROPOLITAN CITY OF TURIN - HOMOGENEOUS ZONES



FORMER BRONDI AREA

The former Brondi area is in Settimo Torinese, a municipality located in the Turin North metropolitan area. It has 47'006 inhabitants.

The Turin North metropolitan area includes 7 municipalities (Borgaro Torinese, Caselle Torinese, Leinì, San Benigno C.se, San Mauro Torinese, Settimo Torinese, Volpiano), has 133'855 inhabitants and measures 175 square kilometres.

FORMER PININFARINA AREA

The former Pininfarina area is in San Giorgio Canavese, a municipality located in the Occidental Canavese area. It has 2'556 inhabitants.

The Occidental Canavese area comprises 46 municipalities including San Giorgio Canavese. It has 84'308 inhabitants and measures 975 square kilometres.

4.2.2 METROPOLITAN CITY OF TURIN - RESIDENT POPULATION



About 1.3 million people live in the Turin area, two thirds of them in the town of Turin. Overall, the number of residents in the capital of Piedmont has globally decreased over the last 40 years, in favour of the municipalities in the first belt. In Turin, after a significant decrease until the end of the 1990s, in the recent years the population remained substantially stable, except in some areas, where it increased (areas of the historic centre and Spina Centrale, a long and impressive area running north-south in the municipal territory).

4.2.3 METROPOLITAN CITY OF TURIN - MAIN INDUSTRIAL AREAS



Source: *Torino Atlas.* (2018, May). Urban Lab Torino. Retrieved 27 October 2021, from https://urbanlabtorino.it/pubblicazioni/torino-atlas-3/

As shown on this map, the industrial areas are particularly present in Turin and its surroundings, mainly concentrated in the western part of the city.

4.2.4 METROPOLITAN CITY OF TURIN - BROWNFIELD SITES



Year of construction

- Area disused in 1989 and reused before 1997
- Area still disused in 1997 and reused before 2001
- Area still disused in 2001 and reused before 2005
- Area still disused in 2005 and reused before 2012
- Area still disused at 2012 and not yet reused at 2016

Brownfield sites by surface area

- . Less than 18,000 m²
- \circ $\;$ Between 18,000 m^2 and 60,000 m^2
- ^o Between 60,000 m² and 140,500 m²
- O Between 140,500 m² and 300,000 m²
- Over 300,000 m²

Areas of intervention

ZUT (urban transformation zones) -ATS (Areas to be transformed for services) Source: *Torino Atlas.* (2018, May). Urban Lab Torino. Retrieved 27 October 2021, from <u>https://urbanlabtorino.it/pubblicazioni/torino-atlas-3/</u>

Turin's urban fabric has expanded over time, particularly since the Second World War, and has merged with neighbouring municipalities. Turin has been, and still is, the protagonist of a massive phenomenon of urban redevelopment, which plays extensively on the reuse of existing spaces and originates mainly from the decommissioning of industrial areas.

4.2.5 METROPOLITAN CITY OF TURIN - WORKERS IN THE MAIN SECTORS



2021, from https://urbanlabtorino.it/pubblicazioni/torino-atlas-3/

The crisis of 2008 led to a downsizing of Turin's business fabric, which mainly affected the manufacturing and agricultural sectors and, in recent years, trade and construction.

The highest concentrations of workers are to be found in the south-west and north-east, as well as in central areas of the capital of Piedmont. The tertiary sector has a strong presence particularly in the centre of Turin, while industrial workers are concentrated mainly in the ring on the outskirts of the capital, and those in the construction sector are scattered all over the place. As for multinationals, more than 20 local units with more than 250 employees are located in the capital, with a few in the municipalities of the first belt.

4.3 FORMER BRONDI AREA

4.3.1 PRESENTATION OF THE SITE Former Brondi building

The building was, «from the 70s until 2002, the headquarters of the Brondi company (founded in Turin in 1935) which specialized in the production and distribution of fixed telephone equipment.

The complex, which includes the plant and the surrounding land, is located near the entrance to the Turin-Aosta motorway (towards France), and to the Turin North Ring Road.

A short distance away is the industrial and commercial centre of Settimo Torinese, which includes the largest Italian Retail Park, a logistics hub for shipments, IT companies, textiles and engineering plants.»33

Specific informations

Land surface: 25'000 m²

Built-up area allowed: max 50%

Existing gross floor area: 9'784 m²

Gross floor area allowed: 25'000 m²

Building state: poor condition

There was no need to activate a remediation procedure.

33 Città metropolitana di Torino, LINKS Foundation, Consorzio Insediamenti Produttivi del Canavese, & Confindustria Piemonte. (2019, November). TRENTAMETRO Attraction of investments in the metropolitan area. LINKS Foundation. (p.34)



200m Source: Google Earth. (n.d.). Google Earth. Retrieved 10 November 2021, from https://earth.google.com/web/





The former Brondi area is situated really close to highway paths, which makes it easy to access with a car. The closest train station is Settimo Torinese station. Then, to reach the area, an additional thirty minutes ride is needed with buses. The area is also reachable by bus only from the centre of Turin.





The former Brondi building has access from private and public transports. But with public transport the site is more difficult to access. Indeed, bus stops are present, but they are quite far from the site itself. In order to have more attraction to the site, a further work on public transports should be done to allow people to access the area in an easier and more secure way.

HighwaysProvincial roadsBus linesBus stops



The former Brondi area is situated in a big industrial area. It is a district where there are many construction factories. Also, near the site some commercial centres are present that can be considered as attraction points to the area.

Considering the activities present in the neighbourhood, it would make sense to create a building with the same purpose.





The former Brondi area is in the middle of industrial buildings. Some cultural buildings are present, but they are in very poor condition, even abandoned places. Creating a new logistic facility would allow new industries to have their central hub near the centre of Turin.



4.3.4 DESCRIPTION



Fig. 198 - Proposed activities for the former Brondi area (data compiled by the author)

For this site, industrial space was proposed. In fact, after discussion with Mr. Corrado Grosso, who was in charge of the analysis of the former Brondi area for the Trentametro initiative, it was found that another industrial brownfield was present nearby and that it is currently being transformed into a logistic centre for the MAIP Group. It seemed therefore interesting to create a space in continuity, but more multifunctional, where other companies could settle.

For the economical assessment, the land surface and the existing gross floor area were first determined based on the information of the Trentametro document. Then, the areas of the activities were also defined by the gross floor area indicated in the Trentametro document and by some references found online. For the planning fees, research on the municipality of Settimo Torinese website was carried out.

For the construction costs, the prices were

evaluated on the basis of the references given in «Prezzi Tipologie Edilizie 2019». Then, a time distribution plan of the construction works was established by semesters allowing for the distribution of the pure construction costs.

For the sales prices, a value was found on the website of the «Agenzia delle Entrate». However, as the price is given for a building in a normal preservation state, it may be increased in the case of the construction of a new building. Then, a time distribution plan of the sales prices was established by semesters allowing for the distribution of the income.

The discount rate was researched on the «Rendimenti BTP netti» website. The value is chosen in relation to the total time duration of the project.

4.3.5 ECONOMICAL ASSESSMENT

COSTS:	quanti	ty unit cost	Total (E)	%	I Sem.	II Sem.	III Sem.	IV Sem.	V Sem. V	l Sem. VII	Sem. VIII	Sem. IX S	em. X Se	m. XI Sem	. XII Sem.	XIII Sem.	10000
and according to a	0.00	-	000000	0 4	%0	700%	%0	%0	%0	%0	%0	%0	%0	%	0% 0	° 0%	700%
	(618)	0	000.0677	0.61	%0	5230000	10%	15%	15%	15%	20%	20%	0%	%0	60 %0	6 0%	100%
		against															
Building design and construction fees	8%	construction	009,609	4.1	0	30'480	096.09	91440	91'440	91'440	121920	121'920	0	0	0	0	609/600
		0000			%0	%0	50%	%0	50%	%0	%0	%0	%0	%0	60 %0	%0 %0	100%
Planning fees 1° - residential	n ³	0 23.2	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0
Planning fees 1° - tertiary - Attività Direzionale	n ² 20	00 43.41	867'99	9.0	0	0	43'399	0	43'399	0	0	0	0	0	0	0 0	86799
Planning fees 1° - industrial - attività produttive	n ² 230	11.5	7 266'173	1.8	0	0	133'087	0	133'087	0	0	0	0	0	0	0	266'173
Planning fees 2° - residential	n ³	0 28.5	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0
Planning fees 2° - tertiary - Attività Diezionale	n² 20	9.6 00	19'373	0.1	0	0	9'687	0	9687	0	0	0	0	0	0	0 0	19'373
Planning fees 2° - industrial - attività produttive m	n ² 230	2.9	67'057	0.4	0	0	33'528	0	33528	0	0	0	0	0	0	0	67'057
					%0	%0	50%	%0	50%	%0	%0	%0	%0	0%	0% 03	\$ 0%	100%
Taxes on construction costs - residential		*	0	0.0	0	0	0	0	0	0	0	0	0	0 1	0	0	0
Taxes on construction costs - tertiary comm.	.,	% actual cost	381'000	2.5	0 /00/	0 /002	190'500	0 /00	190'500	0 /00	0 /00	0 /00	0	0 /00	0	0 0	381'000
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CONS TRUCTION COSTS:	ŀ	L	404 0 0 0	-	•	000 011 0	101 000 1	att 10	110 100				,	,			
					%0	5%	20%	25%	25%	20%	5%	%0	%0	%0	60 %0	\$ 0%	100%
Industrial - Logistic spaces	n ² 11'5	00 23:	3 2'679'500	17.9	0	133975	535'900	669'875	669'875	535'900	133975	0	0	0	0	0	2'679'500
					%0	5%	20%	25%	25%	20%	5%	%0	%0	0%	60 %0	\$ 0%	100%
Industrial - Production spaces m	n ² 11'5	00 23:	3 2'679'500	17.9	0	133'975	535'900	669'875	669'875	535900	133975	0	0	0	0	0	2'679'500
					%0	5%	20%	25%	25%	20%	5%	%0	%0	0%	0% 03	\$ 0%	100%
Tertiary - Office spaces + Administration	n² 2'0	1.03	2'072'000	13.9	0 /00	133'975	535900	669'875	669'875	535900	133975	0	0	0	0	0 0	2'679'500
	-		4 761000	, ,	%0	%0	%0	%0	20%	40%	30%	10%	%0	%0	0% v	° 0%	100%
	-	0	000 6/1	<u>v</u>	°0%	%0	0%0	0%	20%	40%	30%	10%	0%	0%	0%	6 0%	100%
Lands cape - Green area	2	00	14,000	0.1	0	0	0	0	2800	5600	4200	1.400	0		0		14000
Total			7'620'000	50.9	0	267'950	1.071'800	1'339'750	1'377'550 1	147.400	324'650	18'900	0	0	, 0	0	5'548'000
-		against	0011081		00.0001	0.0000	0000000	00000	0.0001	010 010 1	00000	00000					
Overheads	2%	construction	152'400	1.0	19'050	19'050	19'050	19'050	19'050	19'050	19'050	19'050					152'400
Marketing expenses	2%	againstsale	570'800	3.8	0	0	14'604	12'420	22630	18'630	60718	50'094	82'802	13:470 62"	166 49'26	5 70'000	486'800
TOTAL COSTS			14'958'402	100.0	19'050	4'035'080	3'044'215	1.462'660	1.920'870 1	1.276.520	526'338	209'964	82,802 4	3.470 62"	166 49'26	6 70'000	12.802.402
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KEVENUES: SALES - Down payment: 30%	dual	IN SAIR PIICE	I DIGI	/0	'IIIAC I	'IIIAC II	TUACIII	TILAC AL	V 2011. V			sem. IX s	em. X Se	m. XI Sem	. XII Sem.	XIII Sem.	
					%0	%0	10%	10%	14%	15%	16%	17%	18%	0%	60 %0	\$ 0%	100%
Industrial - Logistic spaces	n ² 115	00 00	3'105'000	10.9	0	0	310'500	310'500	434700	465750	496'800	527850 5	558'900	0	0	0	3'105'000
					%0	%0	10%	10%	14%	15%	16%	17%	18%	0%	0% 03	s 0%	100%
Industrial - Production spaces	115	06 00	3'105'000	10.9	0 %0	0 %0	310'500	310'500	434700	465750	496'800	527850 £	558'900 18%	0 %	0 %0	0 0 0	3'105'000
Tertiary - Office spaces + Administration	20	2.10	1/260'000	4.4	•	0	126'000	126'000	176'400	189'000	201600	214'200	26800	-			1"280100
-					%0	%0	10%	%0	24%	%0	31%	%0	35%	%0	0% 0	\$ 0%	100%
Parking - Outdoor parking	n 2	80 13'00	1'092'000	3.8	0	0	109'200	0	262'080	0	338'520	0	882200	0	0	0 0	1*092'000
Total	-		8'562'000	30.0	0	0	730'200	621'000	1'131'480	931'500 1	332'120 1'	055'700 1'5	000.00	0	0	0 0	7'302'000
SALES - Balance: 70%					100		100	100	100	202	1001	1001			000	1001	10001
Industrial - Lonistic snaras	115	06	7745'000	25.4	%0	%/) 0	%0	%0	%0	0%0	724500	724500 10	14% 014300 1'05	15% 175% 14595	0% 1/231'65 200 1/231'65	6 1304100	7"2451000
	-		2000	2	%0	%0	%0	%0	%0	0%	10%	10%	14%	15% 1	6% 179	6 18%	100%
Industrial - Production spaces	n ² 115	06 00	7245'000	25.4	0	0	0	0	0	0	724500	724'500 11	14300 1'0	36750 11592	200 1'231'65	0 1304100	7"245'000
		00000	00010100	0.01	%0	%0	%0	%0	%0	%0	10%	10%	14%	15% 1	6% 179	6 18%	100%
Tertiary - Office spaces + Administration	μ ² 50	01.7 00	2840.000	5.01	0%0	0%0	0%0	0%0	0%0	0%0	10%	294.000	24%	0% 4/0.3	1% 4599'8U	6 35%	2.94000%
Parking - Outdoor parking	n 2	80 13'00	2'548'000	8.9	0	0	0	0	0	0	254'800	0	511520	0 789'	880	0 891'800	2'548'000
Total			19'978'000	70.0	0	0	0	0	0	0 1	.103.800 1.	449'000 2'6	40'120 2'17	3'500 3'108'	280 2'463'30	0 3'500'000	17'038'000
TOTAL REVENUES:			28'540'000	100.0	0	0	730'200	621'000	1'131'480	931'500 3	035'920 2'	504'700 4'1	40'120 2'17	3'500 3'108'	280 2'463'30	0 3'500'000	24'340'000
UNLEVERED CASH FLOW					(19.050)	(4.035.080)	(2'314'015)	(841'660)	(188.390)	(345'020) 2	509'582 2'	294'736 4'0	157'318 2'13	0.030 3.046	114 2'414'03	4 3'430'000	
FINANCIAL EXPOSURES					10101010	Concernments		Constraint into		too too too	inter and in the second se				00 101 010 100		
Inancial charges year se	emester	yea	r semester		(NGN_RL)	(4.054.600)	(0.468./44)	(14/0.150)	8 444 016) (8	.g) (795./66.	(10.1/01) (4.5	(a) (a) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	79.90Z)	1338 4.524	191 0.940.48	966.5/5.01 0	
PRETAX CASH FLOW	AISSEN W 14-7	01.0	* CO.O.	Am	(19.050)	(4.035'550)	(2.414.143)	(1.001.406)	(104 410)	(553'546) 2	287'386 2'	129'028 3'9	144.186 2.11	4'300 3'046'1	853 2'416'29	6 3'433'469	
TAXES																	
tax exposure (1) - IRES (Istituto di Ricerche 24.00% Economico Sociali)					(19'050)	(4'054'600)	(6'468'744)	(7.470'150)	8.444.016) (8	.997'562) (6'	710'176) (4'!	81'148) (6	36'962) 1'47	7'338 3'046'1	853 2'416'29	6 3'433'469	
tax exposure (2) - IRAP (Imposta Regionale sulle 3.90%					(13.335)	(2'824'556)	(1'400'750)	(402'862)	(213'129)	37'936 2	667'483 2'	357'725 4'0	182'158 2'14	3'071 3'064'	764 2'428'81	4 3'451'000	
total taxes					•					(1.480) (104.032)	(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	59'204) (43	8.141) (850.7	70) (674'63	() (958'622)	
NET CASH FLOW					(19'050)	(4'035'550)	(2'414'143)	(1'001'406)	(973'866)	(555'025) 2	183'354 2'	037'076 3'7	84'982 1'67	6'159 2'196'	082 1'741'66	1 2'474'848	
year Sé discount rate 0.42%	o 21%																
NPV € 6'8	821'668																
IRR (year) 18.78%	8.98%																

Chart n°7 - DCF Analysis. Hypothesis on investment/construction and sale: Construction costs, revenues from sales, time distribution plan and financing terms (data compiled by the author)

PAYBACK PERIOD	I Sem.	II Sem.	III Sem.	IV Sem.	V Sem.	VI Sem.	VII Sem.	VIII Sem.	IX Sem.	X Sem.	XI Sem.	XII Sem.	XIII Sem.
Cumulative cash flow	(19'050)	(4'054'600)	(6'468'744)	(7'470'150)	(8'444'016)	(8'999'041)	(6'815'687)	(4'778'611)	(993'629)	682'530	2'878'613	4'620'273	7'095'121
Cumulative cash flow 8'000'000 6'000'000 4'000'000 2'000'000 (2'000'000) (4'000'000) (6'000'000) (8'000'000) (10'000'000)	(19050)	(4054'600)	(6'468'744)	(7'470'150)	(8444016)	With vest mor in be i.e. a proje	(815687) In this go or wo ney and etweer about ect.	graph uld, ir d not Sem five ye	we ca n theo only pa lester i ears af	n ider ry, ac aying. nine a fter the	2878613 htify w tually Here nd Se e first	/hen t be g it wou emeste step	he in- aining uld be er ten, of the
(8'000'000) (10'000'000)			VIII IX	X XI >	(II XIII								

Chart n°8 - DCF Analysis. Hypothesis of investment/construction and sale: Cumulative cash flow (data compiled by the author)

Cost of building lot		IRR	IRR variation	% IRR variation
Variation %		18.78%		
-15%	77	20.23%	1.45%	7.72%
-10%	81	19.77%	0.99%	5.27%
-5%	86	19.21%	0.43%	2.29%
0%	90	18.78%	0.00%	0.00%
5%	95	18.24%	-0.54%	-2.88%
10%	99	17.83%	-0.95%	-5.06%
15%	104	17.32%	-1.46%	-7.77%

Cost of industria	l spaces	IRR	IRR variation	% IRR variation
Variation %		18.78%		
-15%	198	21.91%	3.13%	16.67%
-10%	210	20.82%	2.04%	10.86%
-5%	221	19.83%	1.05%	5.59%
0%	233	18.78%	0.00%	0.00%
5%	245	17.76%	-1.02%	-5.43%
10%	256	16.85%	-1.93%	-10.28%
15%	268	15.88%	-2 90%	-15 44%

Sale price of ind	ustrial spaces	IRR	IRR variation	% IRR variation
Variation %		18.78%		
-15%	765	12.87%	-5.91%	-31.47%
-10%	810	14.89%	-3.89%	-20.71%
-5%	855	16.84%	-1.94%	-10.33%
0%	900	18.78%	0.00%	0.00%
5%	945	20.69%	1.91%	10.17%
10%	990	22.55%	3.77%	20.07%
15%	1035	24.38%	5.60%	29.82%

Chart n°9 - DCF Analysis. Hypothesis of investment/construction and sale: Sensitivity analysis (data compiled by the author)



For the sensitivity analysis, the three highest values were chosen, the cost of the building lot, the construction cost of the industrial spaces and their sale price.

As shown in the Spider graph, the variation of the cost of the building lot is the value that has less influence. In opposition, the variation of the sale price of the industrial spaces has a big influence on the Internal Rate of Return. Meaning that the sale price is very important.

Chart n°10 - DCF Analysis. Hypothesis of investment/construction and sale: Sensitivity analysis - "spider graph" (data compiled by the author)

4.3.6 RESULTS

The former Brondi area being in a very bad shape, it is proposed to demolish the whole building to build a new one.

This area is situated in an industrial neighbourhood and as a continuity to the project being built nearby, it is proposed to create a logistic and production space. Indeed, this area could be interesting for new factories to have their central hub near the centre of Turin.

After the economical assessment, the following results are highlighted.

- The Net Present Value (NPV) that represents the cost of the project, 6'821'668€ for the former Brondi area project.

- The Internal Rate of Return (IRR) that represents the percentage that an investor would receive every year corresponding to 18.78% in this case.

- The Payback Period that is when the investor does not need to pay anymore and begins to receive the benefit of his investment, in this case, about five years after the start of the project.

Furthermore, for this proposal the price per square metre amounts to 273€/m². Compared with the case studies analysed, it is lower.

Actually, the project with the closest price is the «Bois du Cazier Site» that has a similar surface of 24'264m² and a price of 650€/m². We can consider that the price of «Bois du Cazier Site» is higher, because the renovated spaces are for a museum, a coffee shop and an event space, whereas for the former Brondi area the spaces created are industrial spaces.

With the NPV over zero, the IRR at 19% and the Payback Period ending during the project period, we can see that the project would be profitable.



Chart n°11 - Integration of the data found for the former Brondi area in the data of the case studies for the price per m^2 over the years (data compiled by the author)



Chart n°12 - Integration of the data found for the former Brondi area in the data of the case studies for the price per m^2 with the number of inhabitants (data compiled by the author)



Chart n°13 - Integration of the data found for the former Brondi area in the data of the case studies for the price per m² with the total surface area in m² (data compiled by the author)

4.4 FORMER PININFARINA AREA

4.4.1 PRESENTATION OF THE SITE

Former Pininfarina area

«The PININFARINA plant was established in 1987 to produce the Cadillac Allanté. In the following years, it became the production site for other successful models, such as the Fiat Coupé, the Peugeot 406 Coupé and the Lancia K SW.

The plant ceased its activity in 2011, the last of the three Pininfarina plants (the other two were located in Grugliasco and Bairo Canavese).

The complex is located near the A5 Valle d'Aosta motorway junction.»³⁴

Specific informations

- Industrial area: 196'000 m²

- Agricultural area: 138'000 m²

Built-up area allowed: 37'876 m²

Existing gross floor area: 38'00 m²

Gross floor area allowed: 27'000 m²

Building state: poor condition

A remediation procedure was completed and resulted in constraints and control obligations.

Land surface:

34 Città metropolitana di Torino, LINKS Foundation, Consorzio Insediamenti Produttivi del Canavese, & Confindustria Piemonte. (2019, November). TRENTAMETRO Attraction of investments in the metropolitan area. LINKS Foundation. (p.34)







SAN GIUSTO The former Pininfarina area is located near the highway. Therefore, the site is very easily accessible by car. However, the area is very poor in terms of public transport. Indeed, there is no close train station. The nearest train station is in San Benigno Canavese, which is 13 km away and requires an additional thirty minutes bus drive.





The former Pininfarina area has access from private and public transports, though poor. There is only one bus circulating in the whole region. Also, there are bus stops, but they are quite far from the site itself. The closest bus stop is «San Giusto (capella)», approximately 15 minutes away from the site on foot.

Highways Provincial roads Bus lines O Bus stops



The area includes three main house districts, San Giusto, San Giorgio Canavese and Montalenghe. While industry factories are present along the main road, there is only one big supermarket in San Giorgio Canavese for the three cities.

The neighbourhoods have everything close like small supermarkets for primary needs, but the area lacks common facilities.





This area is mainly a house district. Commercial and cultural activities are concentrated close to the city centre and the secondary road passing through there.

Creating a new attraction point in this city would allow to bring life to this place.



4.4.4 DESCRIPTION



Fig. 203 - Proposed activities for the former Pininfarina area (data compiled by the author)

After analysis of the area of San Giusto, it was clear that there was a lack of commercial space. This area is quite big and there are only small supermarkets close to the city centre. People have to go to San Giorgio Canavese for food shopping, which is at about 3km.

Since the site has a big building area, it was decided to plan a supermarket accompanied by small shops, a catering area, a do-it-your-self shop and a garden centre.

For the economical assessment, the land surface and the existing gross floor area were first determined based on the information of the Trentametro document. Then, the areas of the activities were also defined by the gross floor area indicated in the Trentametro document and by some references found online. For the planning fees, research on the municipality of San Giorgio Cavanese website was carried out.

For the construction costs, the prices were evaluated on the basis of the references giv-

en in «Prezzi Tipologie Edilizie 2019». Then, a time distribution plan of the construction works was established by semesters allowing for the distribution of the pure construction costs.

For the sales prices, a value was found on the website of the «Agenzia delle Entrate». However, as the price is given for a building in a normal preservation state and is very low, it may be increased in the case of the construction of a new building. Then, a time distribution plan of the sales prices was established by semesters allowing for the distribution of the income.

The discount rate was researched on the «Rendimenti BTP netti» website. The value is chosen in relation to the total time duration of the project.

4.4.5 ECONOMICAL ASSESSMENT

costs:	quant	ity unit cos	t Total /c	1	%	l Sem.	II Sem.	III Sem.	IV Sem.	V Sem.	VI Sem.	VII Sem. \	/III Sem. I.	X Sem.	K Sem. XI	Sem. XIIS	em. XIII Ser	n.
Land acquisition $m^2 (gfa)$	27'0	000	90 2'430	3 000.0	5.0	0	2'430'000 4%	0	0 15.02	1502	1502	790/C	0	0	0	0	0 200	0 2'43
Building design and construction fees	8%	against constructik	on 2'345	5840	1.8	0	117292	234584	351876	351'876	351876	469168	469'168	0	0	0	0	0 2'34
		costs				%0	%0	50%	%0	20%	%0	%0	%0	%0	%0	%0	%0	%0
Planning fees 1° - residential m ³ Planning fees 1° - tertiary - commercial m ²	251	000	3.23 1.95 1'098	0 (1750 2	0.0	0 0	0 0	0 549'375	0 0	0 549'375	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0 1'09
Planning fees 2* - residential m ³		0 21	3.51	0	0.0	0 (0 (0	0 0	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
rkanning Nees ∠ - tentary - commercial	Ñ	8	2.02	06/0		° %0	%0	%0 <u>9</u>	%0	50%	%0	°~0	%0	%0	%0	0%0	0%	0%0
Taxes on construction costs - residential Taxes on construction costs - tertiary-comm.		7% actual co	st 1'466	1150 33	0.0	0 0	0 0	0 733'075	0 0	0 733'075	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 1'46
	1000	00	Ca and	01 20		%0	50%	50%	%0	%0	%0	%0	%0	%0	%0	%0	°0%	0% o
cemointon / recramation Total	3217	/36 30	17.228	r630 3	5.5	•	7.373'362	6'460'979	351'876	1.752'201	351'876	469'168	469'168	• •	0	0	0	0 17'22
CONSTRUCTION COSTS:						%0	5%	20%	25%	25%	20%	2%9	%0	%0	%0	%0	%0	%0
Commercial - Supermarket, Shops, Food court	13'0	1,	228 15'964	1000	2.9	0%0	798'200 5%	3192800 20%	3991000 25%	3991'000 25%	3'192'800 20%	798'200 5%	0%0	0%0	0%0	0 %0	0%0	0% 15'96
Commercial - Do-it-yourself m ²	6.0	1.	027 6162	1.	2.7	0	308'100	1232'400	1540'500	1540500	1232400	308'100	0	0	0	0	0	0 6'16
Commercial - Garden centre	6.0	1.	027 6'162	1:	2.7	0%0	5% 308100	20%	25%	25%	20%	5% 308'100	0%0 0	%0 0	%0 0	°%0	0%0 0	0% 616
Parkina - Outdoor parkina m2	0.1	000	50 50	0001	2	%0	%0	%0	%0	20%	40%	3 <i>0</i> % 15'000	10% 5'000	%0	%0	%0	%0 0	0% 0%
0 						%0	%0	%0	%0	20%	40%	30%	10%	%0	%0	%0	%0	%0
Parking - Underground parking	72	8	484 902	2000	0.2	° %0	° %0	0%0	0%	20%	40%	30%	10%	° %0	o %0	n %0	0%	e
Landscape - Green area m ² Total		500	34 17 29'323'	000.	0.0	•	0	0 4'425'200	0 5'531'500	3'400 5'544'900	6'800 4'452'000	5'100 1'126'400	1700 6'700	00	• •	00	00	0 22'19
Overheads	2%	against constructio	586 586	3460	12	73308	73'308	73'3.08	73308	73'308	73'308	73'308	73'3.08					28
Marketing expenses	2%	againstsa	ies 1395	1800	59	0	0	86'424	120'450	33735	32475	224'978	291775	91'624	75'075	54'418 2	5025 30	121 1'06
TOTAL COSTS			48*533	10 10	0.0	73'308	8'552'970	11'045'911	6.077'134	7'404'144	4'909'359	1'893'854	840'951	91.624	75'075	54'418 2	5.025 30'	121 41'07
REVENUES:	duan	tity sale pric	e Total	_	~	I Sem.	Il Sem.	III Sem.	IV Sem.	V Sem.	VI Sem.	VII Sem.	(III Sem.	K Sem. X	(Sem. XI	Sem. XIIS	em. XII Ser	÷
SALES - Down payment: 30%						%0	%0	40%	10%	15%	15%	10%	5%	5%	%0	%0	%0	%0
Commercial - Supermarket, Shops, Food court	131	900 2'	750 10725	5'000 1.	5.4	0	0 /00	4290'000	1072500	1608750	1608750	1072'500	536'250	536'250	0 ,00	0 /00/	0 /00	0 1072
Commercial - Do-it-yourself	9	2.	750 4'950	2 000.0	2	0	0	% 0	4950'00	0	0	0	0	0	0	e 0	0	0 4'95
Commercial - Garden centre	9	100 2'	750 4'950	2 0001	5	%0	%0	0% 0	100% 4950000	%0	% <i>0</i>	%0	0%	%0	%0	%0	0%	0% 4.95
Parkino - Ortdoor narkino		A0 131	312	000	14	%0	%0	31200	%0	25% 78'000	%0	30% 93600	%0	35%	%0	%0	%0	0%
		8				%0	%0	10%	%0	25%	%0	30%	%0	35%	%0	%0	%0	%0
Parking - Underground parking Total		160 13	20'937'	000.	0.0	•	•	62'400 4'321'200	6.022'500	156000 1'686'750	1.608'750	18/200 1'166'100	0 536'250	218'400 645'450	• •	0 0	• •	0 15'98'
SALES - Balance: 70%	L	L				-	100		100	100	100	1001	1000	100	4 864			
Commercial - Supermarket, Shops, Food court	13(2.	750 25'025	3000	5.9	° 6	° 0	% O	%n	s °	% O	40%	2'502'500	3753750	3753750 2%	502'500 1'25	5% 11250 1251	250 2502
Commercial - Do-it-yourself	9	100	750 11'550	1000	6.5	%0	%0	0%0	0%0 0	%0	0%	0%0 0	11'550'000	0%0 0	%0	%0 0	0%	0% 0% 0%
Commercial - Garden centre	90	100	750 11'550	1000	6.5	%0	%0	%0	0% 0	%0	%0	%0	100% 11'550'000	%0	%0	%0 0	0%	0% 11'55
Parkina - Outdoor parking		80 13'	728	1000		%0	%0	0%0	0%0	%0	0%0	1 <i>0</i> % 72'800	%0	25%	%0	30% 218/400	0% 3	800 72
Davidion - Indervenund nasis ind		13.	14 50	000		%0	%0	%0	%0	%0	%0	10% 145800	%0	25%	%0	30%	0% 3	35%
Teahing - orbergourd peakarg		2	48*853	000.	0.0	•	•	•	•	•	•	10'082'800	4.052'500	3'935'750 2	3'753'750 2'1	720'900 1'25	1.250 1.506	050 37'30
TOTAL REVENUES:			062.69	1000 10	0.0	0	0	4'321'200	6'022'500	1'686'750	1'608'750	11'248'900	14.588'750	4'581'200	3'753'750 2'	720'900 1'25	1.250 1.506	050 53'29
UNLEVERED CASH FLOW						(73'308)	(8'552'970)	(6'724'711)	(54'634)	(5'717'394)	(3,300,609)	9'355'047	13'747'800	4'489'576	3'678'675 2'	666'482 1'22	6'225 1'475	929
RNANCIAL EXPOSURES					-													
Inancial charges year somest Interest 5.00% 2.47'	ter 7% passiv	0	rear semt. 0)	sster .05% activ		(73'308)	(8'554'780) (8'554'780)	(15'565'869) (213'071) (6'937'782)	(16'004'903) ((384'400) (439'034)	(395'242) (22'117'539) (395'242) (6'112'636)	25'964'342) ([.] (546'194) (3'846'803)	(641'191) (641'191) 8'713'855	3'928'689) (426'002) 3'321'797	463'868 (97'019) 4'392'557 3	4'142'775 6' 232 3'678'907 2'6	811"327 8'04 2'071 668'553 1'22	0.957 9.520 ⁻ 3.405 4 ⁻ 9.630 1.479 ⁻	906 019 948
TAXES																		1
tax exposure (1) - IRES (Istituto di Ricerche 24.00% Economico Sociali)						(73'308)	(8'628'087)	(15'565'869) (16'004'903) (22'117'539) (2	:5'964'342) (1	7'250'486) (3'928'689)	463'868	3'678'907 2't	668'553 1'22	9.630 1.479	948
tax exposure (2) - IRAP (Imposta Regionale sulle 3.90%						(51'315)	(5'987'079)	(3'410'937)	1.768'507	(3'496'150)	(1.827'801)	9.923'203	14'000'085	4'517'063	3.701198 2.6	682'807 1'23	3'733 1'484'	965
hurter roomuve/									(68'972)			(387'005)	(546'003)	(287'494) (1	1.027'284) (7	.45'082) (34:	3'227) (413'1	101)
NET CASH FLOW year semes to	ter					(73'308)	(8'554'780)	(6'937'782)	(508'006)	(6'112'636)	(3'846'803)	8'326'850	12'775'794	4'105'063	2'651'623 1'	923'471 88	6'403 1'066'	847
discountrate 0.42% 0.21	1%																	
NPV NPV 8 42%2 44%	34%																	

Chart n°14 - DCF Analysis. Hypothesis on investment/construction and sale: Construction costs, revenues from sales, time distribution plan and financing terms (data compiled by the author)

PAYBACK PERIOD	I Sem.	II Sem.	III Sem.	IV Sem.	V Sem.	VI Sem.	VII Sem.	VIII Sem.	IX Sem.	X Sem.	XI Sem.	XII Sem.	XIII Sem.
Cumulative cash flow	(73'308)	(8'628'087)	(15'565'869)	(16'073'875)	(22'186'511)	(26'033'313)	(17'706'463)	(4'930'669)	(825'606)	1'826'017	3'749'487	4'635'890	5'702'738
10'000'000 5'000'000						Witl	n this	graph	We ca	an ider	ntify w	/hen t	he in-
(5'000'000)			/			ves moi	ney an	id not	only p	aying.	Here	it wo	uld be
(10'000'000) (15'000'000)			/			half	after t	he firs	e, i.e. st step	of the	proje	ct.	anu a
(20'000'000)		\bigvee	/										

Chart nº15 - DCF Analysis. Hypothesis of investment/construction and sale: Cumulative cash flow (data compiled by the author)

Cost of building	lot	IRR	IRR variation	% IRR variation
Variation %		8.42%		
-15%	77	9.04%	0.62%	7.36%
-10%	81	8.85%	0.43%	5.11%
-5%	86	8.61%	0.19%	2.26%
0%	90	8.42%	0.00%	0.00%
5%	95	8.20%	-0.22%	-2.61%
10%	99	8.01%	-0.41%	-4.87%
15%	104	7.79%	-0.63%	-7.48%
Constructi supermarket, s co	on cost of shops and food urt	IRR	IRR variation	% IRR variation
Variation %		8.42%		
-15%	1044	12.60%	4.18%	49.64%

11.16%

9.75%

8.42%

7.13%

5.83%

4 649

2.749

1.33%

0.00%

-1.299

-2.59%

3 78

Sale price of shops and	supermarket, food court	IRR	IRR variation	% IRR variation
Variation %		8.42%		
-15%	2338	2.33%	-6.09%	-72.33%
-10%	2475	4.36%	-4.06%	-48.22%
-5%	2613	6.40%	-2.02%	-23.99%
0%	2750	8.42%	0.00%	0.00%
5%	2888	10.44%	2.02%	23.99%
10%	3025	12.45%	4.03%	47.86%
15%	3163	14.49%	6.07%	72.09%

44 899 Chart nº16 - DCF Analysis. Hypothesis of investment/construction and sale: Sensitivity analysis (data compiled by the author)

32.54

15.80%

0.00%

-15.329

30.76



For the sensitivity analysis, the three highest values were chosen, the cost of the building lot, the construction cost of the supermarket, shops and food court and their sale price.

As shown in the Spider graph, the variation of the cost of the building lot is the value that has less influence. The variation of the construction cost of industrial spaces has more influence. And finally, the variation of the sale price of the commercial spaces is the value that has the most influence on the Internal Rate of Return. Meaning that the sale price is very important.

Chart nº17 - DCF Analysis. Hypothesis of investment/construction and sale: Sensitivity analysis - "spider graph" (data compiled by the author)

(30'000'000)

Ш 1

10%

-5%

0%

5%

10%

160

110

1167

122

128

1351

141:

4.4.6 RESULTS

The former Pininfarina area is in a very poor state. Therefore, it is proposed to demolish the whole building to build a new one.

The area is situated in an industrial neighbourhood, but close to San Giusto village. Due to the lack of common facilities, it is proposed to create a commercial centre. Indeed, this area is at the centre of three villages (San Giusto, San Giorgio Canavese and Montelanghe) and could become a new meeting point.

After the economical assessment, the following results are highlighted.

- The Net Present Value (NPV) that represents the cost of the project, 5'338'312€ for the former Pininfarina area project.

- The Internal Rate of Return (IRR) that represents the percentage that an investor would receive every year corresponding to 8.42% in this case.

- The Payback Period that is when the investor does not need to pay anymore and begins to receive the benefit of his investment, in this case, about four years and a half after the start of the project.

Furthermore, for this proposal the price per square metre amounts to 197€/m2. Compared with the case studies analysed it is much lower.

Actually, the «Bellgrove Meat Market Site» has a similar surface of 22'500m2, but a price way more expensive of 2'172€/m2. There are some reasons why. First, this project is located in the United Kingdom, and the prices there are generally known to be higher than in Italy. Then, it is located close to the city centre, whereas the former Pininfarina area is far from the first belt of the city of Turin. Moreover, the «Bellgrove Meat Market Site» project intends to host a variety of activities, a housing part, office spaces and commercial spaces. So, this project is bigger than the former Pininfarina area one. The NPV is positive, the IRR is at 8% and the Payback Period ends before the end of the project. The value of the IRR is low and at the limit of acceptability, which means that for the realisation of this project the buyer(s) of the different activity spaces should be chosen before the start of the works to ensure the feasibility of the project.



Chart n°18 - Integration of the data found for the former Pininfarina area in the data of the case studies for the price per m^2 over the years (data compiled by the author)



Chart n°19 - Integration of the data found for the former Pininfarina area in the data of the case studies for the price per m^2 with the number of inhabitants (data compiled by the author) [ε/m^2]





5. CONCLUSION

Brownfields are more and more present in Europe and also in the whole world. A trend of renovation is starting to appear reinforced by the difficulty to build new constructions on free lands.

As an outcome of the research carried out in the thesis concerning brownfields in Europe, more precisely 22 case studies located in France, Switzerland, United Kingdom, Belgium, Germany and Italy, it is possible to draw some final synthesis.

It is important to consider the renovation of buildings and areas rather than their destruction, because those spaces are part of the heritage of the cities as well as of the countries. Renovation allows for the preservation of the local know-how for further generations. Especially because the construction techniques never stop evolving so the buildings change and their aspect is different.

Moreover, renovating buildings is very valuable, because it allows to reduce the energy consumption and saves materials. Also, it enables providing healthier homes and reducing the energy bills when in use.

Renovation is not only about financial positive aspects. It is also about improving social aspects. In fact, it means transforming an urban void in the city in a functional building and proposing new activities. These can be completely different or represent a continuity of the facilities already present in the district. Also, having new functions in the neighbourhood adds attractivity to the place. The place becomes a new pole of attraction where people can meet.

However, sometimes the reuse of the building is not possible for several reasons. For example, there might be a lot of renovation projects that will not be realised, because it is hard to find investors. In the case studies analysis, most of the projects are part of a big rehabilitation plan where the municipality helps a lot and might distribute subventions. Another reason why it is not possible to reuse the building is the poor state of the edifice as shown in the two cases in the metropolitan city of Turin. They have to be demolished.

One thing also to take into consideration is that even though renovating a building is a good way to keep the heritage of the city, there are other ways to remember the history of the building. For example, the implementation of a space with the history of the place. Or also, as it could be for the former Pininfarina area, the creation of a path inside the commercial centre with the roots of the area and showing how it was before.

In the case of the former Brondi area (area chosen for a feasibility study in this thesis), the renovation of the area would allow to transform the urban void currently present in an industrial building that would reactivate the zone in continuity with the whole neighbourhood.

For the former Pininfarina area (area chosen for a feasibility study in this thesis), the renovation of the area would allow to create an attractive point in the neighbourhood with new common facilities. It would become a place dedicated to the people.

In both cases, the feasibility study shows that the project may wear a certain profitability. For the former Brondi area the calculated Internal Rate of Return is very interesting (18.78%) with a Payback Period starting about five years after the start of the project. For the former Pininfarina area it is acceptable (8.42%) with a Payback Period starting about four years and a half after the start of the project and would imply to find the buyers of the different activity spaces already at the beginning of the project to ensure its completion. In addition, the creation of these new spaces would offer many job opportunities.

«The future is not something we enter. The future is something we create.» -Leonard Sweet

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