

MAGNIFICA FABBRICA

INTERNATIONAL DESIGN COMPETITION



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Preliminary Design Document



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foreword

The Teatro alla Scala is one of the most important theatres in the world, as well as a symbol of the Milanese culture, through which the city and so Italy speak to the world. The uniqueness and prestige of its shows are also linked to the great work that takes place ‘behind the scenes’, in the laboratories, the real productive heart of the theatre, where sets, costumes and every single item to be used on stage are created.

Over the years, laboratories have been housed in various districts of Milan. The first building was constructed in the Bovisa district at the end of the 1940s and housed only the wardrobe, the carpentry and the costume and set warehouse. At that time, there were about fifteen seamstresses working in the wardrobe and only five workers in the carpentry, since the wooden parts of the sets were still very limited. Until the early 1950s, the set design department was located inside the theatre, in the spaces that were later used as rehearsal rooms for the Corps de Ballet.

After the bombing of the theatre in 1943, a complete reorganisation of the spaces was planned: the warehouses in Bovisa were expanded and in 1951 a first group of set designers began working in the new laboratories (at the time the sets were still mostly two-dimensional and pictorial), while the wardrobe was later moved inside the theatre.

In the 1970s, there were about seventy people working in the laboratories. The sets began to require more and more three-dimensional elements made of different materials, while the warehouse began to be insufficient and unsuitable for storing them, since the sets became heavier and bulkier. As a result of this necessity, a large shed in the Municipality of Pero was made available to the Teatro alla Scala, and so all the parts built in the laboratories in Bovisa were brought to this new location to be set up.

However, the need to find a more functional solution and avoid continuous transportation of material, as well as reduce the inconvenience of managing staff that were spread across the different sites, led to the identification of a new location: the former industrial site of the Ansaldo steelworks in the Tortona district, owned by the Municipality of Milan. Since their opening in 2001, the 20,000 m² Laboratori Scala Ansaldo have become one of the largest theatrical ateliers in the world, and every year thousands of visitors come to see them, eager to discover what happens “behind the scenes” and take part in the birth of the shows.

However, the solution of using the former Ansaldo does not fully meet the need for a single space where laboratories and warehouses can be brought together, as they are still located in different parts of the city, in buildings that require significant maintenance.

Hence the will of the Municipality of Milan, shared with the Fondazione Teatro alla Scala, to find a different location of a size suitable for housing the laboratory and storage equipment. The choice of where to locate the new site fell on the area of the former production plant of the Innocenti car manufacturer in Lambrate, which was in operation from the 1930s until it was closed down in 1993 after a series of failed business plans and company crises. As can be

seen in this Preliminary Design Document, the area - of which only a few buildings remain visible today as testimony of its industrial past - has already been partly transformed through the construction of residential buildings, commercial facilities, public spaces and Parco della Lambretta; it will partly find a new identity with the implementation of the Grande Funzione Urbana Rubattino (GFU Rubattino), as indicated in the Territorial Development Plan (PGT “Milano 2030”). Within the GFU Rubattino, next to the new site for the Teatro alla Scala laboratories and warehouses, there are plans to expand Parco della Lambretta and create a centre for research and technological and economic innovation, as well as production/logistics and tertiary/directional functions, a commercial facility and a school.

The localisation choice for the new Teatro alla Scala laboratories and warehouses responds in the first place to a broader strategy defined in the PGT, with which the Administration aims to make Milan a city of neighbourhoods, in which cultural institutions, through new sites, together with large green areas and new parks, are called upon to take an active and central role in the regeneration of residual, underused and abandoned areas within the urban fabric. Expected projects include the expansion of the Politecnico campus in the Bovisa-Goccia area and the construction of new campuses for the Accademia di Brera at Scalo Farini and for the Conservatory of Music in Rogoredo. Expanding the production spaces and at the same time strengthening the relationship between these spaces, the districts in which they are located and the city are the ideas behind these operations. In the specific case of the new site for the Teatro alla Scala laboratories and warehouses, this translates into an increase in the number of exhibition areas and the provision of rehearsal rooms and spaces for staging events and performances, so as to further enhance activities open to the public to bring citizens closer to the world of theatre. It is therefore not just a question of improving and investing in the warehouses and laboratories, which represent the “Magnifica Fabbrica” of one of the most emblematic locations in the city, but of integrating these functions into a broader, more sustainable and inclusive project that will help mark the development of Milan in the years to come.

For these reasons, it was decided that the buildings suitable for hosting these important activities, also in relation to the provisions of the PGT with respect to the GFU, needed the International Design Competition, as an instrument capable of synthesising urban and functional themes linked to innovation, as required by the “Magnifica Fabbrica”. This Competition is therefore launched with the aim of obtaining a project worthy of the name of a Milanese excellence recognised throughout the world, such as the Teatro alla Scala.

OBJECTIVES OF THE COMPETITION

The “Magnifica Fabbrica” International Design Competition envisages the creation of the new site for the Teatro alla Scala laboratories and warehouses and the expansion of Parco della Lambretta, with the aim of regenerating the area located in the Lambrate district, once occupied by the Innocenti plant and not involved in the redevelopment intervention on the west side of the east ring road, between Via Caduti di Marcinelle and Via Rubattino. The project should be unitary and should be carried out in different phases and areas, with reference also to the different functional uses (park and site of laboratories and warehouses), as well as to the different forms, timings and methods of financing. **The creation of the new site for the Teatro alla Scala laboratories and warehouses** is linked to the need to enhance, make more efficient and develop the activities currently carried out in buildings lacking the appropriate characteristics to guarantee an efficient and rational process of cultural creation: laboratories and warehouses, currently located in different parts of the city, are in fact housed in inadequate buildings that would require significant maintenance. The intention of the Municipality of Milan, in agreement with the Fondazione Teatro alla Scala, is to create a new cultural, artistic and production centre, open 24 hours a day, 7 days a week, optimising the set storage, handling and transport methods and bringing all the phases of the creative process into close proximity, from design to production, including technical and artistic activities, offering the public the chance to take part in the birth of the shows.

The new site will consist of spaces that are partly open to the public for carrying out more strictly creative and cultural activities (rehearsal rooms, spaces for events and laboratories) and spaces for storing stage materials.

The project will take into account both the dimensional and localisation characteristics of the areas identified by this Competition, and the technical and functional needs expressed by the Fondazione Teatro alla Scala. It should ensure high standards of quality and functionality and be characterised by an environmentally sustainable approach, focusing on innovative solutions that are resilient to climate change and reduce greenhouse gas emissions.

Competitors will have to assess the preservation of the Water Tower, as an industrial past testimony, compatibly with the planned functions.

The expansion of Parco della Lambretta is linked to the desire to implement green areas in the city, contributing to a significant response to current environmental challenges. The presence of the River Lambro, which already characterises the existing park, should be enhanced and particular attention should be paid both to maximising permeable green areas and to protecting and increasing biodiversity, optimising at the same time construction, management and maintenance costs.

Competitors must preserve and recover the so-called “Palazzo di Cristallo”, also partially, as an testimony of industrial archaeology. It will be fully integrated with the vegetation in the new park, limiting paved areas exclusively to use as possible paths and equipped areas. It should be noted that the two facades of the

building have been declared of cultural interest.

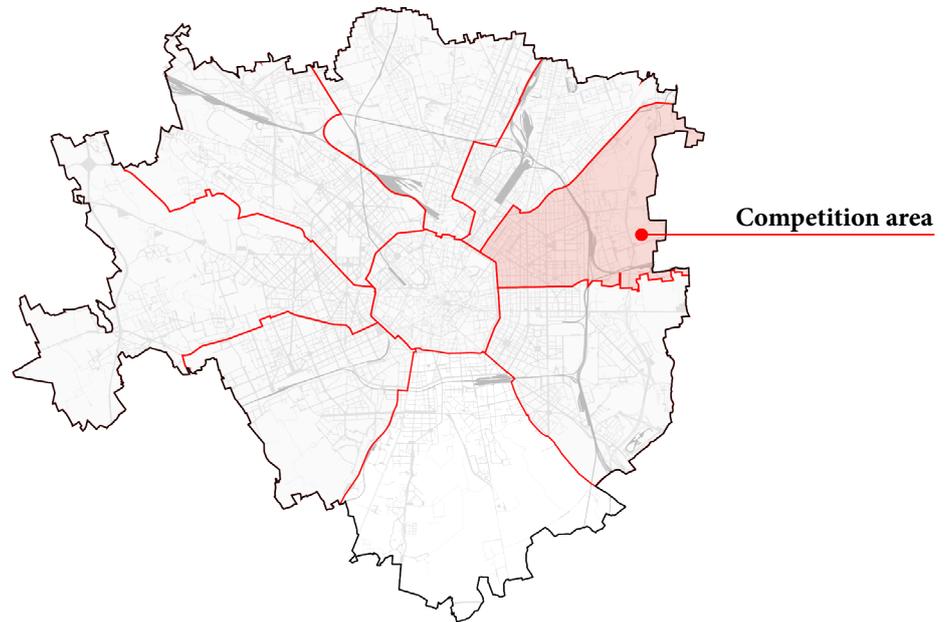
The new park is to become a real landmark for the district, as well as a place for gathering and leisure time. Its proximity to the new site of the Teatro alla Scala laboratories and warehouses will be an opportunity to enhance the park and make it more attractive. It will be able to host various kinds of events, such as shows and concerts, in a perspective of greater openness towards the district and the city: a regeneration operation with interventions, initiatives and activities, resulting from the collaboration between the Fondazione Teatro alla Scala and the Municipality of Milan, aimed at making the park a place for people to gather, also depending on the conservation and recovery of the so-called “Palazzo di Cristallo”.

The relationship with the floodplain area of the River Lambro will be particularly relevant: solutions that contribute to reducing the level of hydraulic hazard will have to be presented and the new green areas must aim at strengthening the ecological connections, as well as creating new landscape relationships.

2.1 THE LAMBRATE DISTRICT

The Competition area, where the new site of the Teatro alla Scala laboratories and warehouses will be built and the Parco della Lambretta will be expanded, is located in the Lambrate district, in Municipality 3, in the north-eastern part of the City of Milan (fig. 1).

fig. 1
Municipality of Milan.
Overview of the Competition
area.



The district is bordered to the east by the Municipality of Segrate, to the south by the Ortica district, to the west by the Città Studi and Casoretto districts and to the north by the Rottole and Cimiano districts.

The precise date of Lambrate foundation is not known. The earliest records date back to Roman times. The district owes its name to the River Lambro, which was once navigable, and along which a *vicus*, or agricultural village, stood in a strategic position due to the fertility of the land and the abundance of water. In his *Naturalis historia*, Pliny the Elder reports that there was a *mansio ad Lambrum*, i.e. a supply station for travellers and there was probably also a river port for the nearby *Mediolanum*. Over the centuries it became a rural village, well integrated into the Milanese territory. In one of the earliest representations, the 1600 *Carta dei dintorni di Milano* by Giovanni Battista Claricio (fig. 2), the then layout of Lambrate appears to include two settlements - “Lambrà” to the north and “Lambrà di sotto” to the south - which would only be joined together along the current Via Conte Rosso during the 20th century. Through the Spanish walls, Milan appears to be physically separated from the surrounding territory, which is characterised by the presence of small villages, as well as mills and farmsteads along rivers and irrigation ditches, alternating with fields and woods.

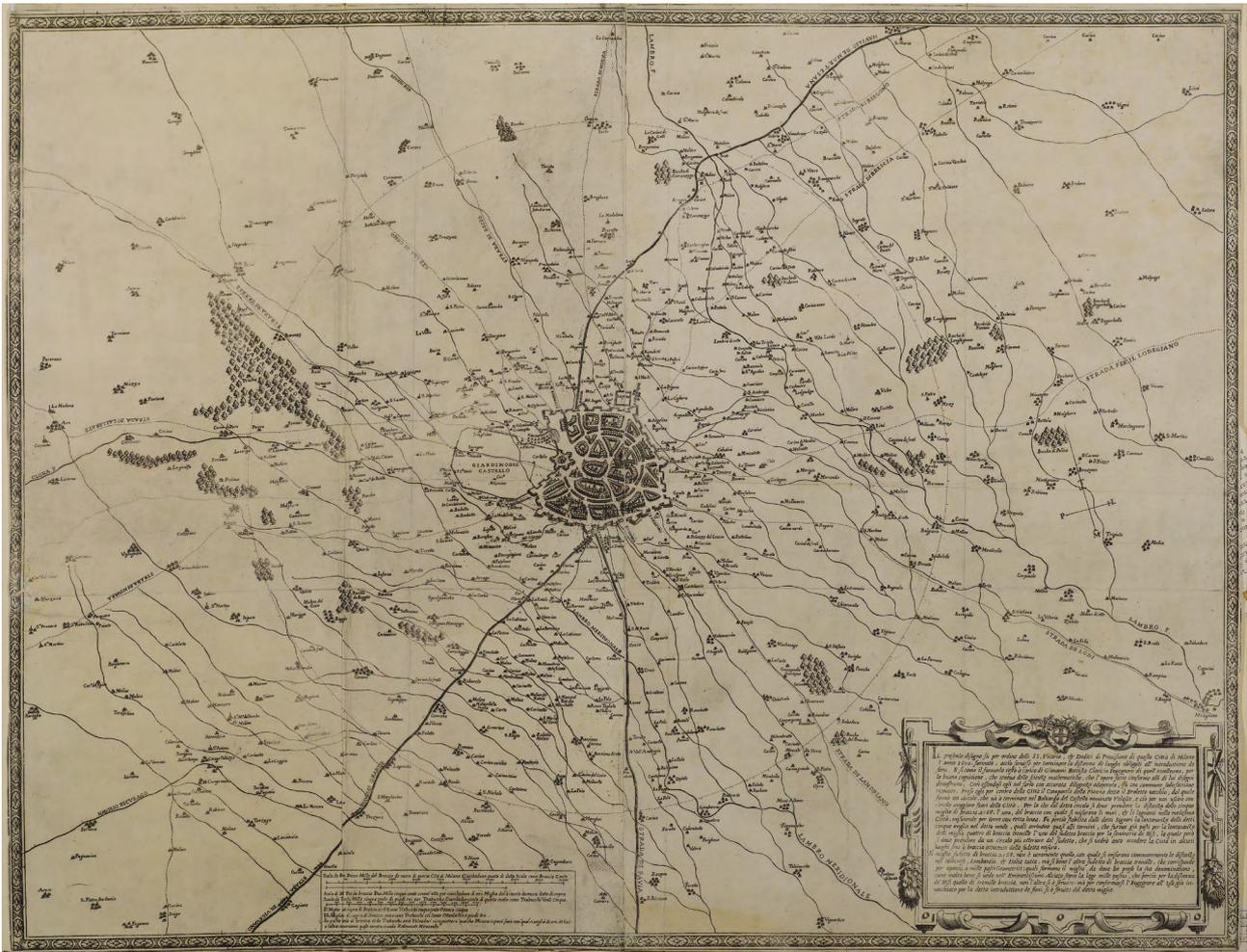


fig. 2
Carta dei dintorni di Milano
 by Giovanni Battista Claricio
 (1600).
 Source: Civica Raccolta delle
 Stampe “Achille Bertarelli”,
 Castello Sforzesco, Milan

During Spanish domination, the first Lambrate war industry was built, i.e. “La Polveriera” in Via Pitteri (fig. 3), which was converted during the Fascism into the Martinitt orphanage and which today is an University residence with the Teatro Martinitt. In a certain sense, “La Polveriera” anticipated the industrial vocation of Lambrate, which will be characterised by a significant presence of factories during the years of the Italian economic miracle.

At the beginning of the 19th century, Lambrate became a Municipality (it maintained its autonomy until 1923, when it was annexed to the City of Milan). The first national census (1861) showed that it covered an area of 946 hectares and had 1,671 inhabitants. The local economy was still mainly based on agriculture and animal husbandry.

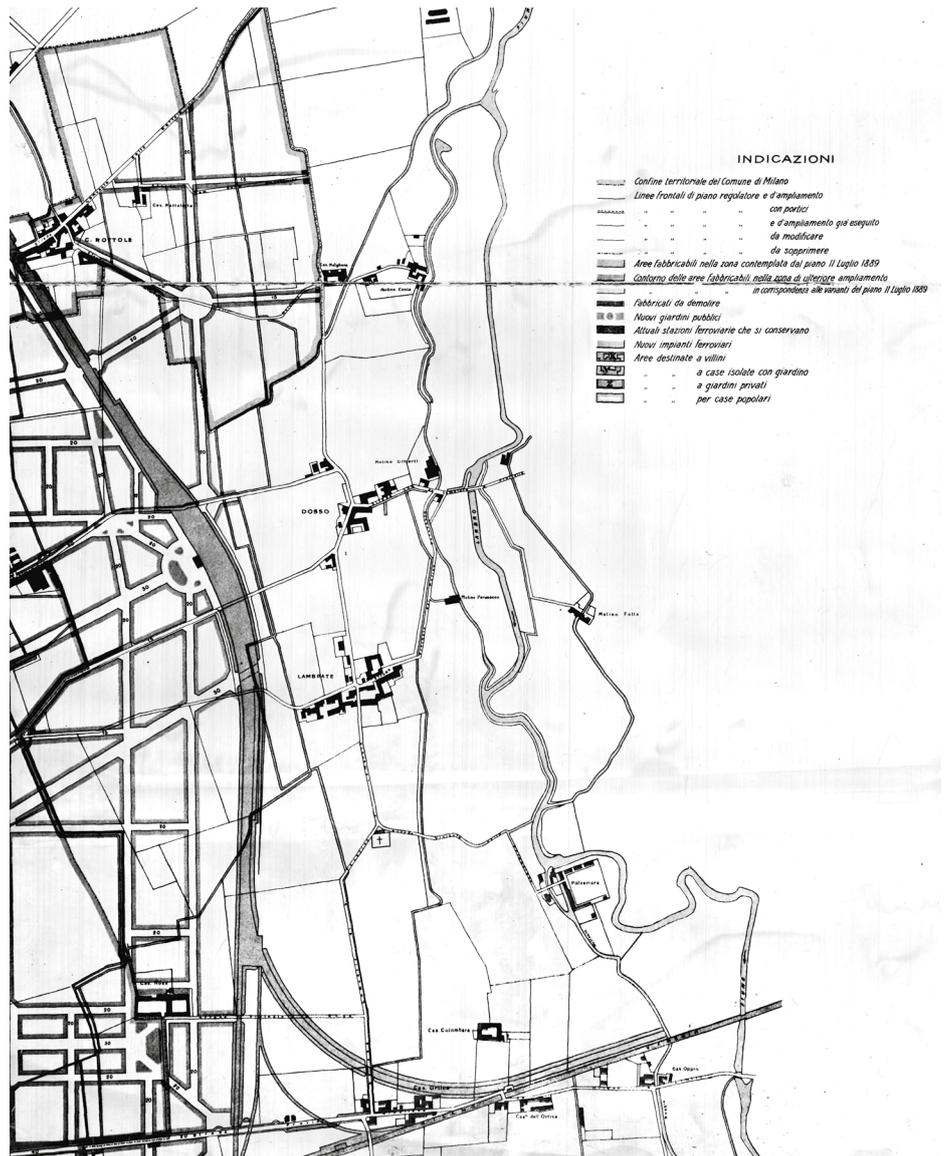
With the construction of the “Fernandea” railway, which connect Milan to Venice through Lambrate, and the subsequent construction of the station and goods yard, the layout of the Municipality of Lambrate changed and the basis were laid for its industrial development (fig. 4).

Before World War Two and afterwards, in the years of the economic boom, the cultivated fields gave way to important manufacturing plants, such as Innocenti, Faema, Bombelli, De Nora and Bracco (still in operation today), which marked the transformation of Lambrate into a working-class district on the outskirts of Milan (fig. 5).

fig. 3
 Carta topografica dei contorni
 di Milano by Giovanni Brenna
 (1833).
 Source: Civica Raccolta delle
 Stampe "Achille Bertarelli",
 Castello Sforzesco, Milan



fig. 4
 Extract from the 1910 General
 Regulatory Plan (PRG) of Milan.
 Source: Civica Raccolta delle
 Stampe "Achille Bertarelli",
 Castello Sforzesco, Milan



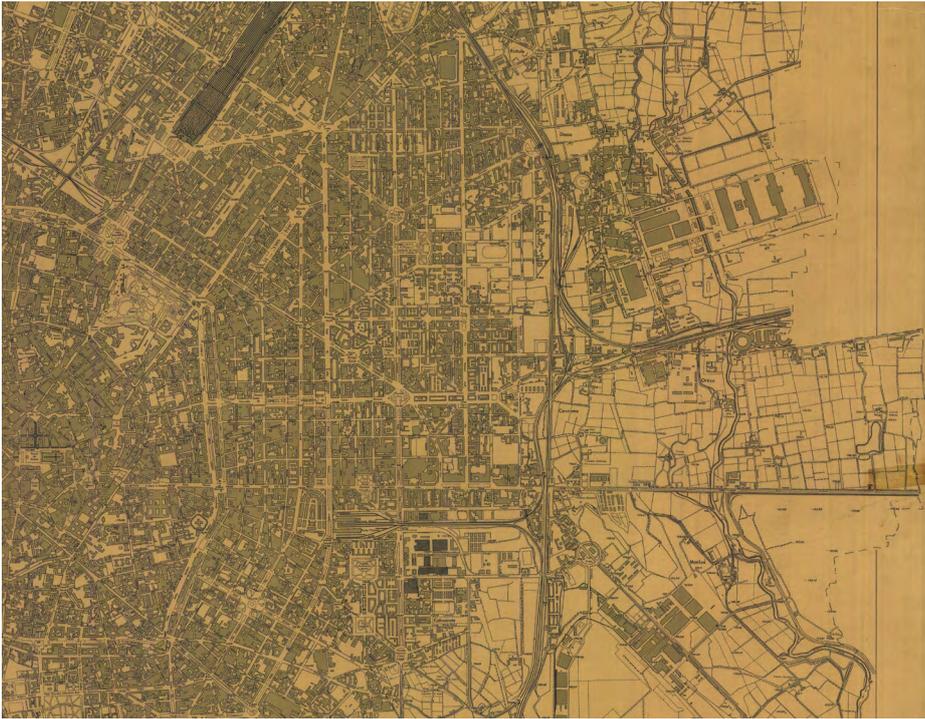


fig. 5
Extract from the 1956 Technical
Map of Milan.
Source: Civica Raccolta delle
Stampe “Achille Bertarelli”,
Castello Sforzesco, Milan

At present, characteristics of the original village are not easily discernible and the district appears to be bound to the west by the railway and to the east by the east ring road, built in the 1970s. However, two different realities can be identified within it: on the one side, the historic town centre, developed around the axes of Viale delle Rimembranze, Via Saccardo and Via Conte Rosso; on the other side, in the easternmost part, the industrial area with old and new factories.

2.2 THE RUBATTINO AREA

The process of industrialisation, especially after the Second World War, transformed the area from an urban and social point of view. Innocenti played a particularly important role, not only because of the production of the well-known Lambretta, which became a symbol of the district over the years, but also because of the size of the factory itself. As we will see in this paragraph, its closure in 1993 generated a post-industrial landscape, now partially awaiting a new identity.

2.2.1 THE INDUSTRIAL PAST

The Competition area is part of a large portion of land once occupied by the Innocenti factory.

In 1933, the Tuscan entrepreneur Ferdinando Innocenti decided to expand his business and set up a new production plant in Milan, specifically in the Lambrate district. The area identified, strategically located close to the River Lambro and not far from the city centre, covered a total area of approx. 600,000 m² (fig. 6).

fig. 6
Aerial view of the Innocenti
factory (1967).
Source: Archivio Roberto
Zabban/Centro per la cultura
d'impresa



The Innocenti factory, originally intended for the production of homonymous steel scaffolding tubes, was bombed and completely destroyed during the Second World War. Despite this, the company managed to recover thanks to its founder's shrewd policies and immediately after the war resumed the production of tubes and related products. In addition to mechanics, in 1947 the company started producing motorbikes, including the well-known Lambretta in its various versions (fig. 7) and from the 1960s invested in the automotive sector (A40, Mini Minor, etc.).

fig. 7
Transporter of Lambrettas inside
the Innocenti factory (1960).
Source: Archivio Roberto
Zabban/Centro per la cultura
d'impresa



In 1964 the company faced its first crisis and in 1966, with the death of Ferdinando Innocenti, the leadership of the company passed to his son Luigi, with the consequent separation of the production lines (mechanics, motorbikes and automobiles), the sale of mechanics to IRI and the creation of INNSE (Innocenti Sant'Eustachio S.p.A.).

In the same period, the automotive sector was taken over by the British Leyland Group which, after a serious crisis in 1976, decided to close the Lambrate plant, which was taken over by the De Tomaso Group owned by the racing driver and entrepreneur Alejandro De Tomaso, after negotiations with the government and trade unions. However, in 1990, due to the huge financial losses of the Maserati Group, of which De Tomaso was the majority shareholder, the shares of Innocenti and Maserati passed to FIAT, which shortly afterwards became the owner of the two brands¹.

In 1993, the factory was closed down permanently and this closure was followed by the process, still in progress and described in the following paragraphs, for the redevelopment of the former industrial plant.

Today, there is almost no trace of the Innocenti factory, and the only buildings still visible (some recovered, others still abandoned) are:

- the building in Via Pitteri, which housed the company offices, now converted into a healthcare residence for the elderly;
- the so called "T9" building in Via Rubattino, which housed the canteen, changing rooms and after-work centre;
- the Study Centre in Via Rubattino, now used as a storehouse by the Municipality of Milan;
- the main and secondary entrances along Via Rubattino;
- the Water Tower;
- the so-called "Palazzo Cristallo", the subject of the following focus.

¹ For further details, see the link: <https://www.registroinnocenti.org/storia-della-innocenti-auto/>

Focus

THE SO-CALLED “PALAZZO DI CRISTALLO”

The so-called “Palazzo di Cristallo”, the oldest of four sheds arranged in parallel on the east side of the ring road, housed the production lines of the A40 in the 1960s (fig. 8).

fig. 8
A40 assembly line inside the so-called “Palazzo di Cristallo” (1962).
Source: Archivio Roberto Zabban/Centro per la cultura d’impresa



The structure is 310 m long and 75 m wide and is divided into three aisles of about 25 m wide and 19.50 m high (fig. 9). It consists of:

- main portals arranged over three aisles, approx. 10 m apart;
- secondary portals, without central columns, approx. 10 m apart.

The central columns then alternate every 10 m and the coverage portals every 5 m.

The steel columns have UPN profiles, joined by welding to steel plates.

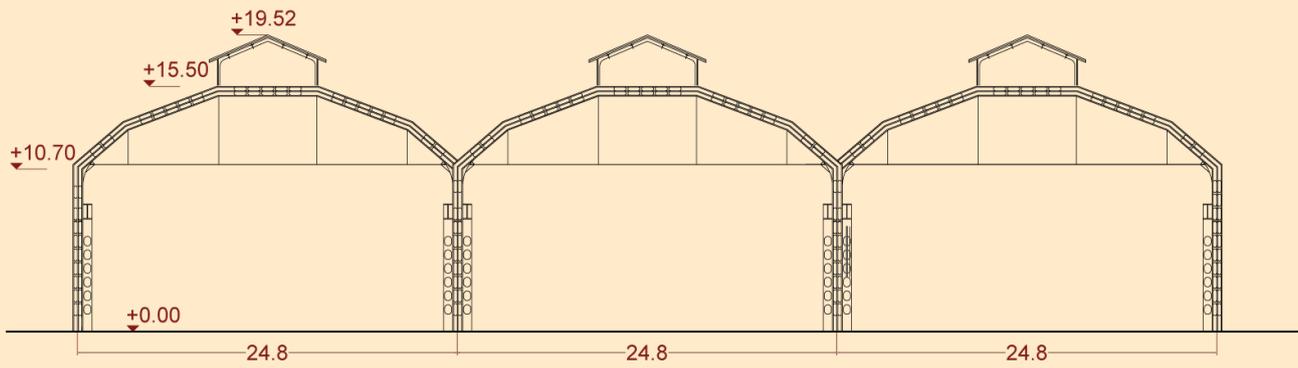
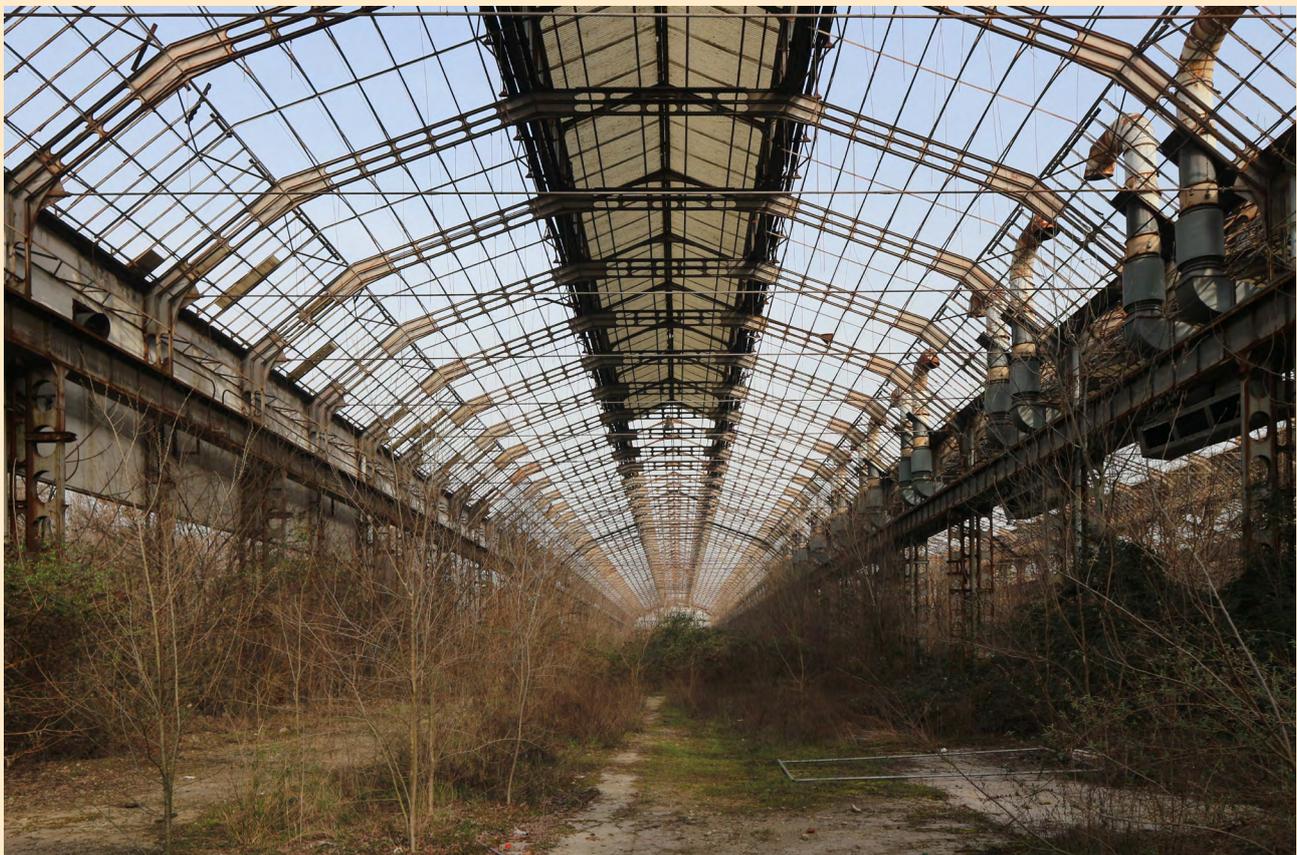


fig. 9
Transversal section of the so-called "Palazzo di Cristallo".

There are three types of columns: lateral single columns; lateral double columns; central triple columns. The latter consist of two external columns, 7.5 m high, which support the bridge crane beams and a central, higher column, which connects with the five-sided polygonal arch truss, with a lantern at the top. The bridge crane beam is a double-T beam, measuring 100x51 cm and consists of four UPN sections connected to plates by nails. The polygonal arch truss consists of three parts, joined together by bolts. The foundations of the columns are made by means of isolated concrete plinths, with underlying reinforced concrete piles, 2-3 metres deep.

The metal structure, in an evident state of neglect and consequent degradation, is today affected by a process of corrosion (fig. 10).

fig. 10
The current status of the so-called "Palazzo di Cristallo".



2.2.2 THE PRU RUBATTINO

After the closure of the factory, there is a need to give new life and meaning to these vast disused site. To this end, in 1997, the Municipality of Milan, the Lombardy Region and the Ministry of Public Works signed a **Programme Agreement**, which was implemented through the approval of the Urban Redevelopment Programme no. 8.1 (the so-called “PRU Rubattino”) and in 1998 through the signing of the implementation Convention between the Municipality of Milan and the company Rubattino 87 Srl, the latter having in the meantime become the owner of the areas.

The objective of the Programme, developed over a ten-year period and divided into two phases of four and six years respectively, is the redevelopment of the areas through the construction of a series of public and private works with different functions (residential, commercial, office and production), as well as the creation of a large urban park.

In 2006, the Supplementary Deed to the original Convention was signed, extending the term of validity of the Convention to 2011.

In 2008, following the conclusion of almost all the works of the first phase, due to delays in the implementation of the Programme, also linked to the need to relocate INNSE activities, the Municipality of Milan and the company Rubattino 87 Srl signed an act of recognition of the implementation status of the PRU, recording what had been achieved and redefining the programme of public and private interventions: in particular, residual residential building quotas were brought forward to the first phase, in order to complete the neighbourhood west of the ring road, and the implementation of the large urban function planned in the so-called “Palazzo di Cristallo” area was postponed.

In 2011, the Municipality of Milan, the Lombardy Region and the Prefecture of Milan signed an **Amending Act** to the original Programme Agreement, with the adhesion of the companies Rubattino 87 Srl and Camozzi Holding Spa, to which in the meantime the ownership of the INNSE plant had been transferred, with the undertaking to the production activity relaunch and the architectural and functional redevelopment of the shed and the adjacent office building. The Amending Act also provides for the construction of a residential neighbourhood in the easternmost part of the PRU, the development of productive, service and commercial activities and the creation of a school. The great urban function of the so-called “Palazzo di Cristallo” was confirmed and the surface for green spaces was increased. As a result of the Amending Act, the validity of the PRU was extended by a further ten years.

Between 2012 and 2013 the company Rubattino Srl presented a proposal for an Integrated Intervention Plan for the second phase. However, the proposal was incomplete and was never integrated and implemented.

Due to the unfavourable economic situation, the difficulties in implementing what was established in the agreements and the overcoming of the urban model²,

² Additional residential building was planned for the easternmost part of the PRU, in a context lacking the characteristics of a consolidated urban fabric and in which the presence of INNSE would have compromised the quality of the planned functions.



the Administration considers necessary to proceed with the modification of the general planning, in order to restart the process of regeneration and development of the site, implementing the public functions and those of public or general interest, with a view to increasing the excellence and attractiveness of the site. The process flows into the variant procedure of the PGT, which was approved in 2019 and became effective in February 2020³.

fig. 11 (on the left)
The spaces under the ring road viaduct and the small lake.
Source: Municipality of Milan

To date, in the PRU a new predominantly residential neighbourhood has been created on the western side of the ring road. The main access to the district is from Via Pitteri, specifically from Piazza Vigili del Fuoco, which is characterised by the presence of several commercial activities. From the square, a tree-lined pedestrian avenue, the main axis of the neighbourhood, divides the residential part in two and connects the square to Parco della Lambretta, formerly Parco dell'Acqua. The park, built in 2004 and covering an area of 110,000 m², is located on both sides of the ring road and under the viaduct (fig. 11). It features childrens' play areas, a five-a-side football pitch, a basketball court (fig. 12) and a table tennis area. There are no kiosks or bars inside. It is characterised by the presence of the River Lambro and a 9,000 m² small lake, partly under the viaduct. In terms of vegetation, the park contains locust trees (*Robinia pseudoacacia* 'Umbraculifera'), field maples (*Acer campestre*), hornbeams (*Carpinus betulus*), ash trees (*Fraxinus excelsior*), Neapolitan alders (*Alnus cordata*), black alders (*Alnus glutinosa*), ash trees (*Fraxinus ornus*), common plane trees (*Platanus x acerifolia*), cypress poplars (*Populus nigra* 'Italica'), oaks (*Quercus palustris*), white willows (*Salix alba*), sophora (*Sophora japonica*) and rowan trees (*Sorbus aucuparia*)⁴.

fig. 12 (on the right)
The basketball court on the east side of the ring road with the so-called "Palazzo di Cristallo" in the background.
Source: Municipality of Milan

The park plays an important role of urban connection, as it makes the space under the ring road viaduct accessible. However, ecological performance can be improved.

³ For further details, see the link: <https://www.comune.milano.it/aree-tematiche/urbanistica-ed-edilizia/attuazione-pgt/rubattino-pru>

⁴ For further details, see the link: <https://www.comune.milano.it/aree-tematiche/verde/verde-pubblico/parchi-cittadini/parco-dell-acqua>

2.2.3 THE GFU RUBATTINO

In the PGT in force, the part of the areas included in the PRU Rubattino perimeter, which remained unimplemented after the failure to complete the provisions of the Amending Act to the Programme Agreement, has been selected to house one of the six Great Urban Functions, planned within the entire municipal territory, giving rise to the so-called “GFU Rubattino”.

The areas included in the GFU Rubattino perimeter, with a total surface of approx. **311,050 m²**, are composed of municipally-owned and privately-owned areas. The GFU Rubattino, which is divided into two areas, respectively on the east and west sides of the ring road, is expected to house public functions and functions of public interest (spaces and services for culture, spaces for research, innovation and technological development, with particular attention to business incubators and accelerators, and a public park) complemented by other more private functions. After the signing of the Framework Agreement (which set out a precise exchange and transfer of areas) and a process of discussion with the Municipality 3, the areas have been reconfigured according to a new project layout that provides for the division into intervention lots (fig. 13), each characterised by the following urban functions:

- sub-lot 1: area owned by the Municipality, of about 88,990 m², divided into two areas located north and south of Via Caduti di Marcinelle, intended for the creation of the Teatro alla Scala laboratories and warehouses;
- sub-lot 2: area currently owned by a private company, of about 16,030 m², located south of the INNSE production plant already present, intended to house a centre for research, training and technological and economic innovation, with particular reference to business incubators and accelerators;
- sub-lot 3: area owned by a private company, of about 111,270 m², bordered to the east by an agricultural area, to the west by the Teatro alla Scala laboratories and warehouses and to the north and south by Via Caduti di Marcinelle and Via Rubattino respectively. The area is intended for the development of production/logistics and tertiary/directional functions;
- sub-lot 4: area owned by the Municipality, of about 68,340 m², aimed at creating an equipped urban park, possibly with functions of public interest also connected to the activities carried out by the Teatro alla Scala;
- sub-lot 5: area owned by a private company, of about 4.560 m², located in correspondence with the areas and the building known as “T9 west side” and located in Via Caduti in Missione di Pace, for the construction of a commercial building up to a Medium-sized Sales Facility;
- sub-lot 6: area owned by the Municipality, of about 5,230 m², located in correspondence with the areas and the building known as “T9 east side” and located in Via Caduti in Missione di Pace, for the construction of a public school building or other public facility.

In accordance with the terms of the Framework Agreement, the parties involved are committed to ensuring the achievement of the environmental sustainability objectives set out in Art. 10 of the Implementation Rules of the PGT Regulatory Plan, specifically the maintenance of as much permeable area as possible.

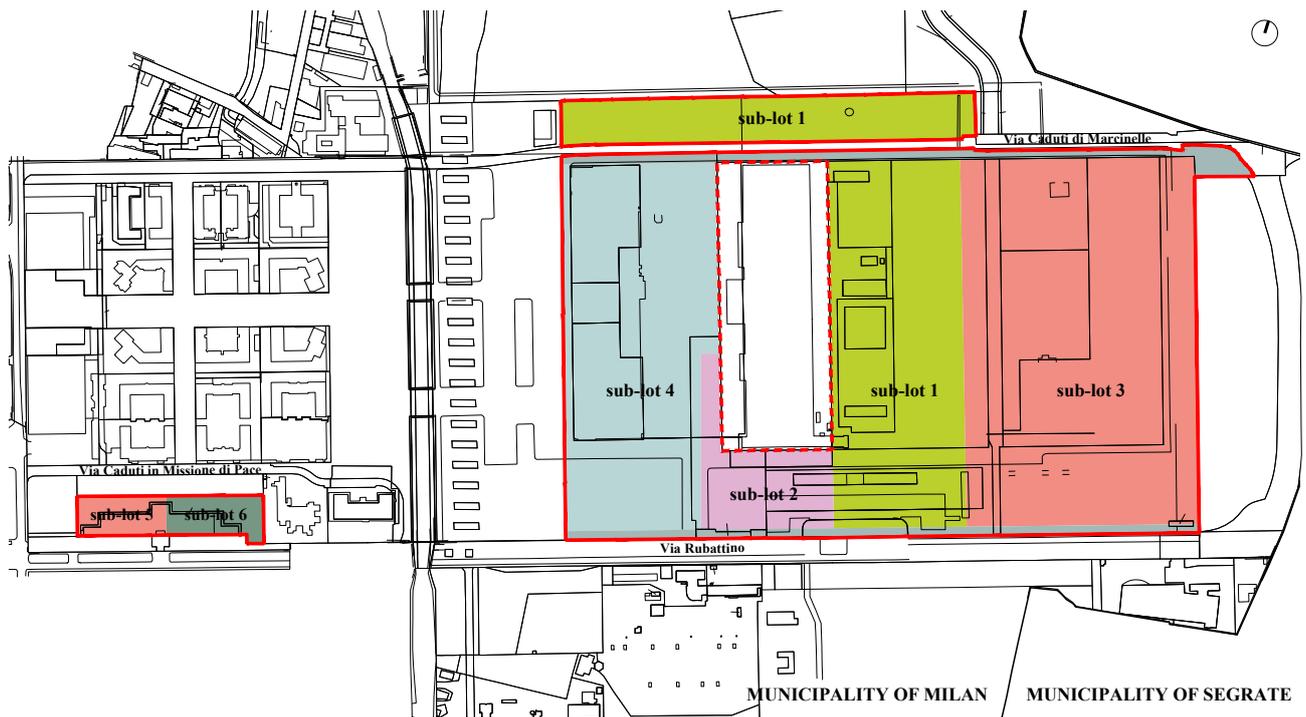


fig. 13
The GFU Rubattino and its intervention lots.

In addition, the heaps currently present in sub-lot 1 (in the area north of Via Caduti di Marcinelle and in the area where the so-called “Palazzo del Cristallo” is located) will be removed by the private owner before the areas are handed over to the Municipality of Milan.

These areas will also be handed over by the private owner to the Municipality of Milan, duly reclaimed - with regard to the parameters prescribed by the regulations in force with reference to commercial and industrial uses (as set out in Table 1, column B - Annex 5 to Part IV of the Legislative Decree 152/2006 as amended) - and devoid of buildings, works and installations, with the exception of the so-called “Palazzo di Cristallo” and the Water Tower. Competitors are reminded that further reclamation work to convert the site into a public green area (as set out in Table 1, column A - Annex 5 to Part IV of the Legislative Decree 152/2006 as amended) is necessary on the basis of three characterisation campaigns carried out in 2008, 2012 and 2014, the results of which are available in the annex “5.7 Piani di caratterizzazione”; the relative costs of the works will not be included in those of the technical and economic feasibility project (PFTE), required by the Competition, and will be subject to subsequent quantification. Furthermore, it is specified that, with reference to the expansion of Parco della Lambretta and for the purpose of its inclusion in the Three-Year Plan of Public Works (PTOP) of the Municipality of Milan, the PFTE can only be approved after the results and approval of preliminary investigations, characterisation plan and reclamation project at technical-economic feasibility or definitive level, in relation to the type of works that will be necessary. Consequently, the winning project must be fully adjusted and coordinated with the reclamation works, as well as with the opinions expressed by the competent institutions and offices.

The realisation of the expansion of the Parco della Lambretta will therefore be subject to the effective compliance of the soils with Table 1, column A - Annex 5 to Part IV of the Legislative Decree 152/2006 as amended.

2.3 OTHER ONGOING TRANSFORMATIONS

The Lambrate district is undergoing a major transformation phase⁵. The relocation of companies and the consequent dismantling of their factories has left many areas vacant, which have been or will be affected by various types of intervention, such as the construction of new buildings and the renovation of the existing, abandoned or underused ones.

The need to give the district a new identity has led to a focus on culture as a driver of innovation and change, as was the case for the former Faema and will be the case for the former Innocenti.

Faema was founded in 1945 and until the 1970s the historic factory in Via Ventura produced coffee machines that were exported all over the world. Then the relocation and subsequent abandonment. In the early 2000s, the factory, which had become an testimony of industrial archaeology, was restored and transformed into an artistic and cultural centre, a landmark not only for the district but also for the entire city. Today it houses professional studios, residences, art galleries, the headquarters of a publishing house, a school for film, music, visual communication and storytelling, commercial activities and a location for events. Since 2010, in this and other renovated spaces in the adjacent streets, exhibitions, conferences and parties linked to the well-known **Lambrate Design District**⁶ are held during Milan Design Week. This and other events have contributed to giving Lambrate the image of an effervescent district today, one of the most attractive and lively in the city: an image that is increasingly associated with concepts such as experimentation, creativity and innovation.

Alongside these mainly cultural initiatives, the district is now also affected by urban planning projects, which aim to redevelop several disused sites (fig. 14). These include the **Lambrate railway station**, one of the seven areas with which the Municipality of Milan participated in the second edition of the Reinventing Cities International Competition⁷. The winning project “Lambrate Streaming” covers an area of about 65,000 m² owned by FS Sistemi Urbani. The heart of the project will be the large public park which will be developed both along the western edge, towards the railway, and along the eastern one, creating a relationship with the consolidated urban fabric. At the centre of the new neighbourhood will be a system of interconnected squares and equipped green areas. As foreseen in the Scali Ferroviari Programme Agreement, affordable

⁵ For further details, see the link: <https://www.ordinearchitetti.mi.it/it/notizie/dettaglio/7644-tra-innocenti-e-lambrette>

⁶ While in 2010 there were 30,000 visitors over the 6 days of the event, in 2019 more than 100,000 visitors attended the various events at the main locations.

⁷ For further details, see the link: <https://www.comune.milano.it/-/reinventing-cities.-scalo-lambrate-un-quartiere-accessibile-tra-verde-piazze-e-poesia>

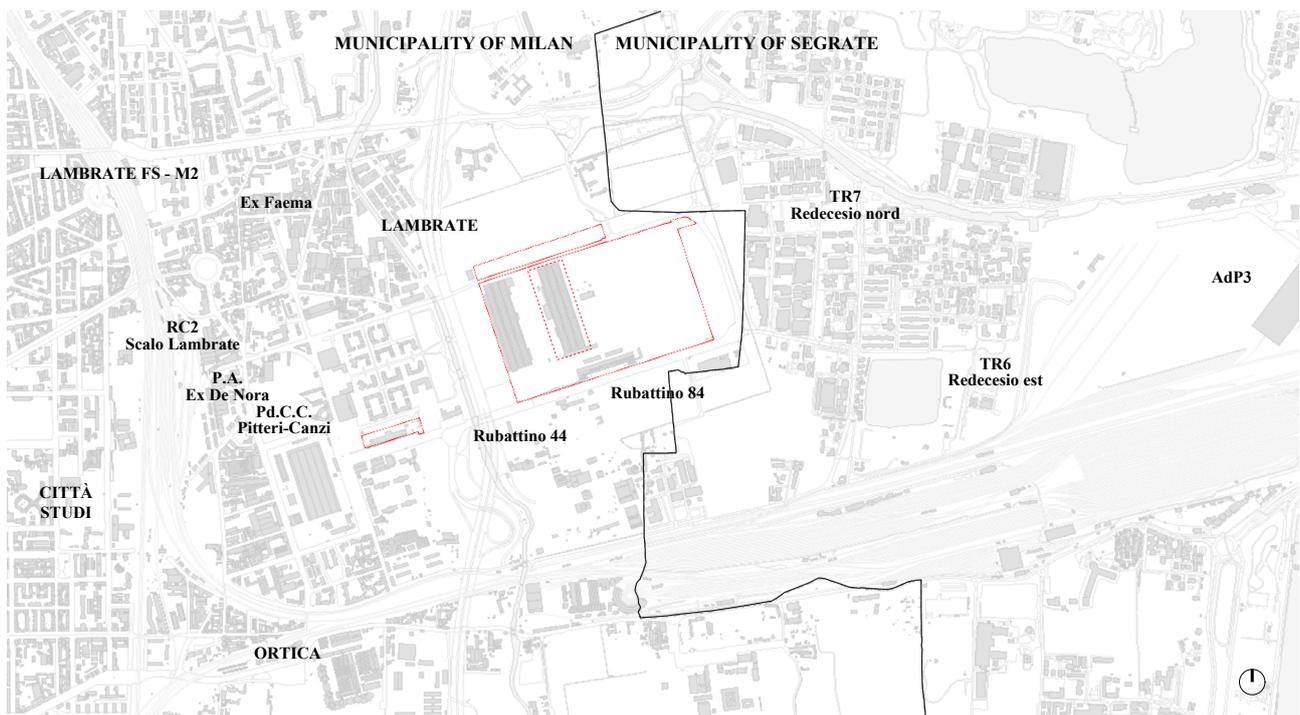


fig. 14
The main urban interventions planned near the GFU Rubattino.

housing solutions will be introduced, mainly for young people and students (Social Housing), together with services for the neighbourhood such as a cultural and recreational centre for exhibitions and performances, childcare services, co-working spaces, a centre for youth aggregation and to support vulnerable groups, as well as neighbourhood commercial activities.

Near the goods yard, there is the **former De Nora Implementation Plan**⁸, which is located on the area once occupied by the homonymous industrial plant, in which new residential buildings (partly Social Housing) are under construction, arranged in a courtyard around a central public park.

In close proximity there was the **Pitteri-Canzi Building Permit Agreed**⁹, which envisaged the construction of new buildings characterised by a functional mix (residential, commercial, tertiary and productive) and a public park (although reclamation has not been completed). To date, the construction of a first part of Social Housing has been completed.

Near the GFU Rubattino, at **Rubattino 44**, a sports facility and a car park for public use are expected to be built. In **Rubattino 84**, on the other hand, the settlement of mainly logistic functions is planned. Both operations will be carried out through direct implementation agreements.

In addition, the Rubattino area is characterised by the concentration of several companies already oriented towards an industrial 4.0 model:

- **INNSE**, born from the division of Innocenti production lines and now owned by Camozzi Holding Spa, which operates worldwide and specialises in the

⁸ See the link: <https://www.comune.milano.it/aree-tematiche/urbanistica-ed-edilizia/attuazione-pgt/via-dei-canzi-1-piano-attuativo>

⁹ See the link: <https://www.comune.milano.it/aree-tematiche/urbanistica-ed-edilizia/attuazione-pgt/pitteri-canzi-pdccc>

- production of components and systems for industrial automation;
- **Centro Elettronico Sperimentale Italiano (CESI Spa)**, which provides worldwide technical and engineering advice in the field of technological innovation for the electrical energy sector;
- **Centro per la Ricerca sul Sistema Energetico (RSE Spa)**, which carries out research in the electro-energy sector, with particular reference to national strategic projects;
- **Enel Smart Grid Lab**, a laboratory where the electricity grids of the future are tested.

These realities will be flanked by the new spaces for research and technological innovation planned in the GFU Rubattino.

Also the neighbouring Municipality of Segrate is affected by a series of urban development projects being implemented, not far from the GFU Rubattino: the **Redeceso East Integrated Intervention Plan**, in which the construction of buildings with mainly residential functions, next to a new sports centre and a public park, has almost been completed; the **Redeceso North Integrated Intervention Plan**, located next to a vast disused production area (former CISE) and in which new buildings with residential, commercial and tertiary functions are planned; the **Programme Agreement - AdP 3** that envisages the construction of a shopping centre.

On the environmental side, there are two important projects involving the urban stretch of the River Lambro: the **project for the Milanese Lambro Ecological Network (ReLambro)** and the **project for the Metropolitan Parco Lambro Extension (EPL; in progress)**. Both are linked to the River Contracts, voluntary instruments of strategic and negotiated planning that pursue the protection, the correct management of water resources and the enhancement of river territories, together with the safeguard against hydraulic risk, contributing to the local development.

Specifically the ReLambro project¹⁰, financed by Fondazione Cariplo, consists three phases

- phase 1: design of the ecological corridor;
- phase 2: first implementation measures;
- phase 3: implementation measures in the south-eastern area (ReLambro SE).

In particular, phase 1 was developed between 2012 and 2014 and was aimed at assessing the large-scale feasibility of implementing the ecological connection along the river. Where possible, modalities of environmental redevelopment and restoration of the ecosystem functionality of the territory between the Parco Locale di Interesse Sovracomunale (PLIS) Media Valle Lambro and the Municipality of San Donato Milanese, including the Rubattino area, were defined. In this phase, a feasibility study¹¹ was developed by ERSAF (Regional

¹⁰ For further details, see the link: <https://www.contrattidifiume.it/it/azioni/progetti-collegati/re-lambro2/>

¹¹ Longo A., Masotti D. & Giacomel A. (a cura di) (2016), *RELAMBRO. Il fiume nuova infrastruttura ecologica della metropoli milanese*, Civica Stamperia del Comune di Milano, Milano, available at the link: http://82.149.33.231/re-lambro/RELambro_publicazione.pdf

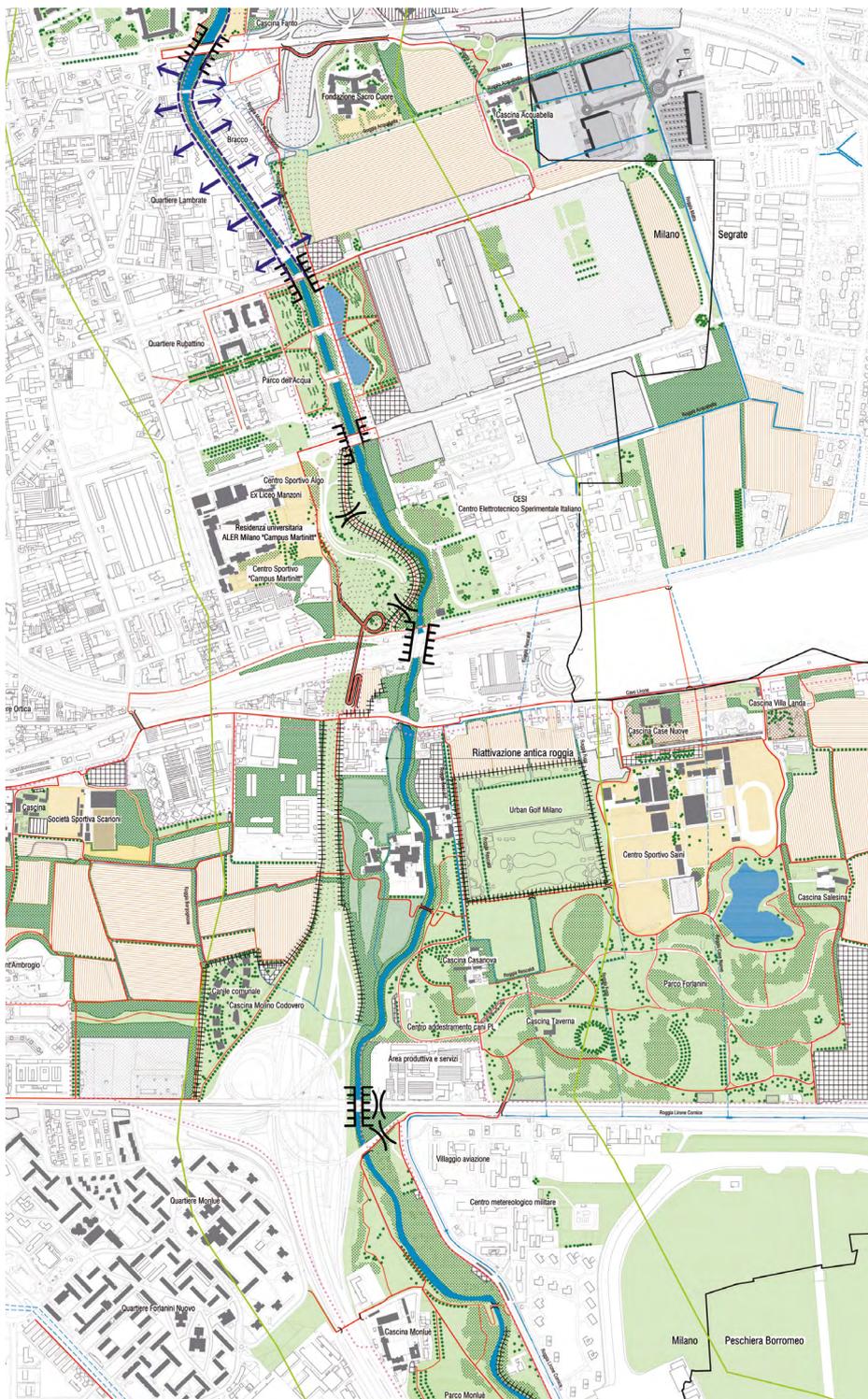


fig. 15
Extract of the ReLambro project masterplan with reference to the Rubattino area.



Agency for Agricultural and Forestry Services of Lombardy Region) as lead agency, in partnership with DASTU (Department for Architecture and Urban Studies of Politecnico di Milano), Municipality of Milan, Legambiente Lombardia and PLIS Media Valle Lambro. The study showed that the River Lambro, in the most critical stretch of the watercourse, between Via Rombon and the Ortica district, is mostly channelled and has minimal permeable banks with little vegetation. Therefore, it seemed necessary to preserve and restore,

where possible, open green spaces to create a system interconnected by the river (fig. 15). In order for the Lambro to take on an ecological role, in particular in the stretch between Via Rombon and Via Caduti di Marcinelle, integrated measures were proposed for the naturalisation of the river bed and banks, restoring visibility to the Lambro and contributing to the improvement of safety conditions in the district. In the next stretch, in correspondence with the Parco della Lambretta, the redevelopment and expansion of the existing park were suggested, including the agricultural areas north of Via Caduti di Marcinelle. It was also recommended that attention be paid to ecological aspects in the expansion of the park and that a cycling/pedestrian link with Parco Lambro and Parco della Lambretta be provided, compatible with ecosystem functions. In the southern stretch, where the presence of the river is still overshadowed by that of the ring road, the proposed interventions were similar to those in the northern stretch.

2.4 ACCESSIBILITY

The various urban developments, including those of supra-municipal importance, planned within and around the GFU Rubattino have required consideration of the sustainability of the existing mobility system.

2.4.1 ROAD NETWORK

The classification of roads with reference to their constructional, technical and functional characteristics is established by Art. 2 of the New Highway Code (Legislative Decree 285/1992 as amended), which divides them into the following types: A - Motorways; B - Main suburban roads; C - Secondary suburban roads; D - Urban highways; E - Urban district roads; E-bis - Urban cycling routes; F - Local roads; F-bis - cycling/pedestrian routes.

In accordance with the indications contained in the aforementioned Code, in the Directives of the Ministry of Public Works for the drafting, adoption and implementation of urban traffic plans (Official Gazette no. 146 of 24/06/1995) and the functional and geometrical standards for road construction (Ministerial Decree 6792/2001), the functional classification of the road network of the Municipality of Milan in the update of the General Urban Traffic Plan - definitively adopted in 2013 - has been defined as shown in the following table:

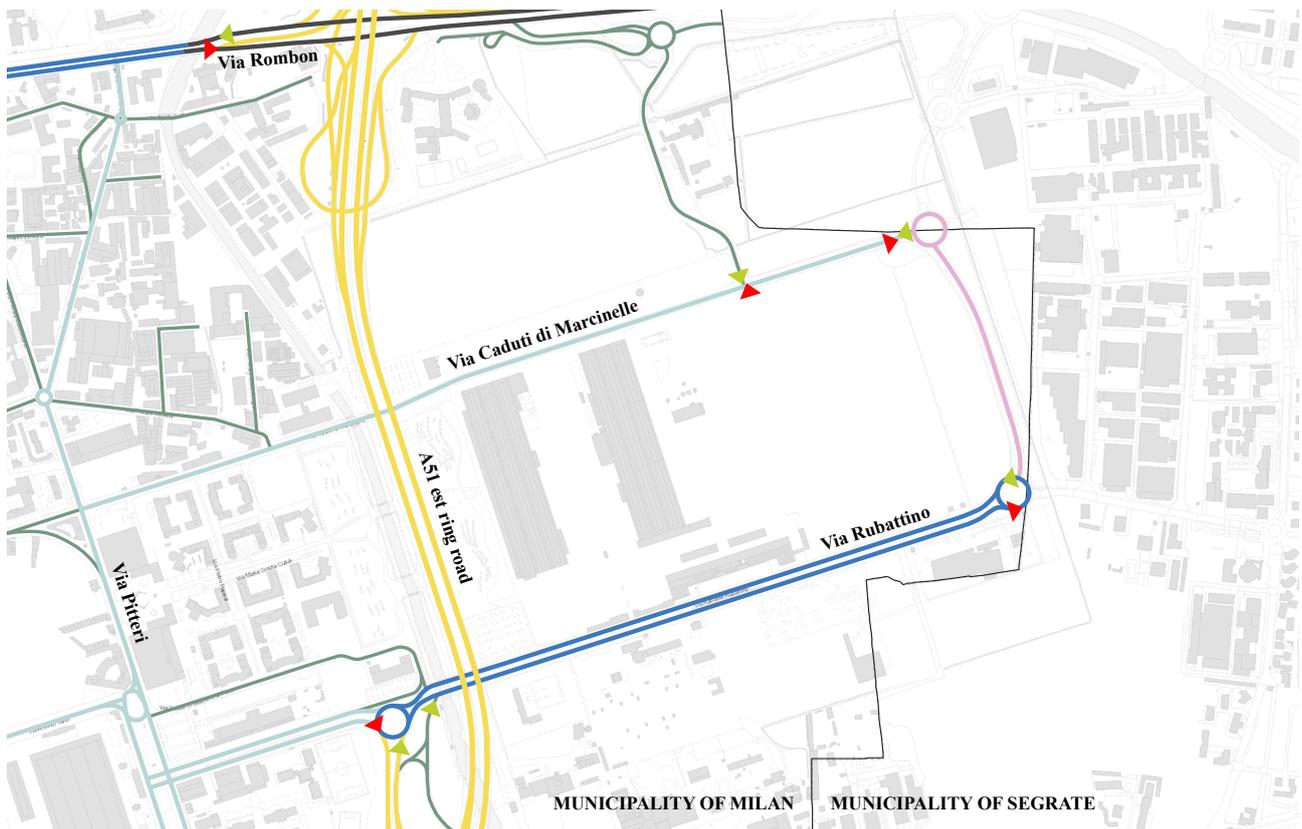
NETWORK	CORRESPONDING ROADS	
	IN EXTRA-URBAN AREAS	IN URBAN AREAS
Primary network	Extra-urban motorways Main extra-urban roads	Urban motorways Urban highways
Main network	Main extra-urban roads	Urban highways Urban inter-district roads
Secondary network	Secondary extra-urban roads	Urban district roads Local urban inter-zonal roads
Local network	Local extra-urban roads	Local urban roads

In particular, in Ordinance no. 334 of 10/03/2021, the roads bordering the Competition area were classified as follows:

- district road, for the eastern section of Via Rubattino; ;
- local inter-zonal road, for Via Caduti di Marcinelle;
- local road, for the north-south road linking Via Caduti di Marcinelle to Via Rombon.

fig. 16

Diagram of the road network according to Ordinance no. 334 of 10/03/2021 showing the road classification and the limit of the built-up area.



District roads generally correspond to the access routes to the central sectors of the city and the trolleybus circle. According to the Ministerial Decree 6792/2001, with regard to category E, district roads have a single carriageway, with 3.00 m lanes, one or more lanes in each direction, 0.50 m right of way, minimum 1.50 m pavement, 12 m attached strips and 10 m buffer strips. For the other main characteristics, a minimum planimetric radius of 51 m, a maximum slope in bends of 3.5%, a maximum longitudinal slope of 8% are determined. A design speed of between 40 and 60 km/h is set.

Local roads fulfil a distribution function within local areas. According to the Ministerial Decree 6792/2001, with regard to category F, local urban roads have a single carriageway, with 2.75 m lanes, one or more lanes in each direction, a 0.50 m right turn lane and a minimum 1.50 m pavement. The other main characteristics are a minimum planimetric radius of 19 m, a maximum transverse slope in bends of 3.5% and a maximum longitudinal slope of 10%. A design speed of between 25 and 60 km/h is set.

Local inter-zonal roads are the access roads to local areas and have the functional characteristics of the class above and the geometric characteristics of the class

Legend

- primary network (motorways)
- main extra-urban network
- secondary extra-urban network
- secondary network (district)
- secondary network (local inter-zonal)
- local network
- ▶ built-up area limit IN
- ▶ built-up area limit OUT

below. They are therefore at an intermediate level between urban district roads (E) and urban local roads (F), with the role of access and distribution within the local network but with geometric standards proper to the local road and a speed limit that can be reduced to 30 km/h.

The Highway Code also defines buffer zones outside and inside built-up areas - Arts. 16 and 18 of the aforementioned Code and Arts. 26 and 28 of the Execution and Implementation Regulations for the New Highway Code (Presidential Decree 495/1992) - on the basis of road classification.

The accessibility to the primary road network is currently guaranteed by the direct connection to the A51 east ring road through exit 7 - Via Rubattino and will be reinforced in the future with the completion of the new layout of the SP 103 Cassanese road which will connect to exit 8 - Lambrate.

There are currently no particular traffic problems along Via Rubattino and at the two roundabouts, the one at exit 7 and the one on the border with the Municipality of Segrate, at the intersection with Via Milano. According to the first modelling assessments of the GFU Rubattino provisions, the situation is not expected to worsen further.

2.4.2 PARKING AREAS

The Competition area is part of a context in which public parking is mainly made up of two ground-level car parks, located near the ring road viaduct, at the intersection with Via Rubattino and Via Caduti di Marcinelle respectively. The car park on Via Caduti di Marcinelle, covering an area of about 3,400 m², can accommodate approx. 100 cars, arranged in 6 rows with 90° diagonal parking spaces, while the one on Via Rubattino, covering an area of about 7,400 m², can accommodate approx. 180 cars, arranged in 10 rows with 45° diagonal parking spaces. Both parking areas have an impermeable asphalt pavement and the lots are separated by flowerbeds bordered by kerbs with trees, mainly *Sophora japonica*.

There are no public parking areas for coaches and other large vehicles.

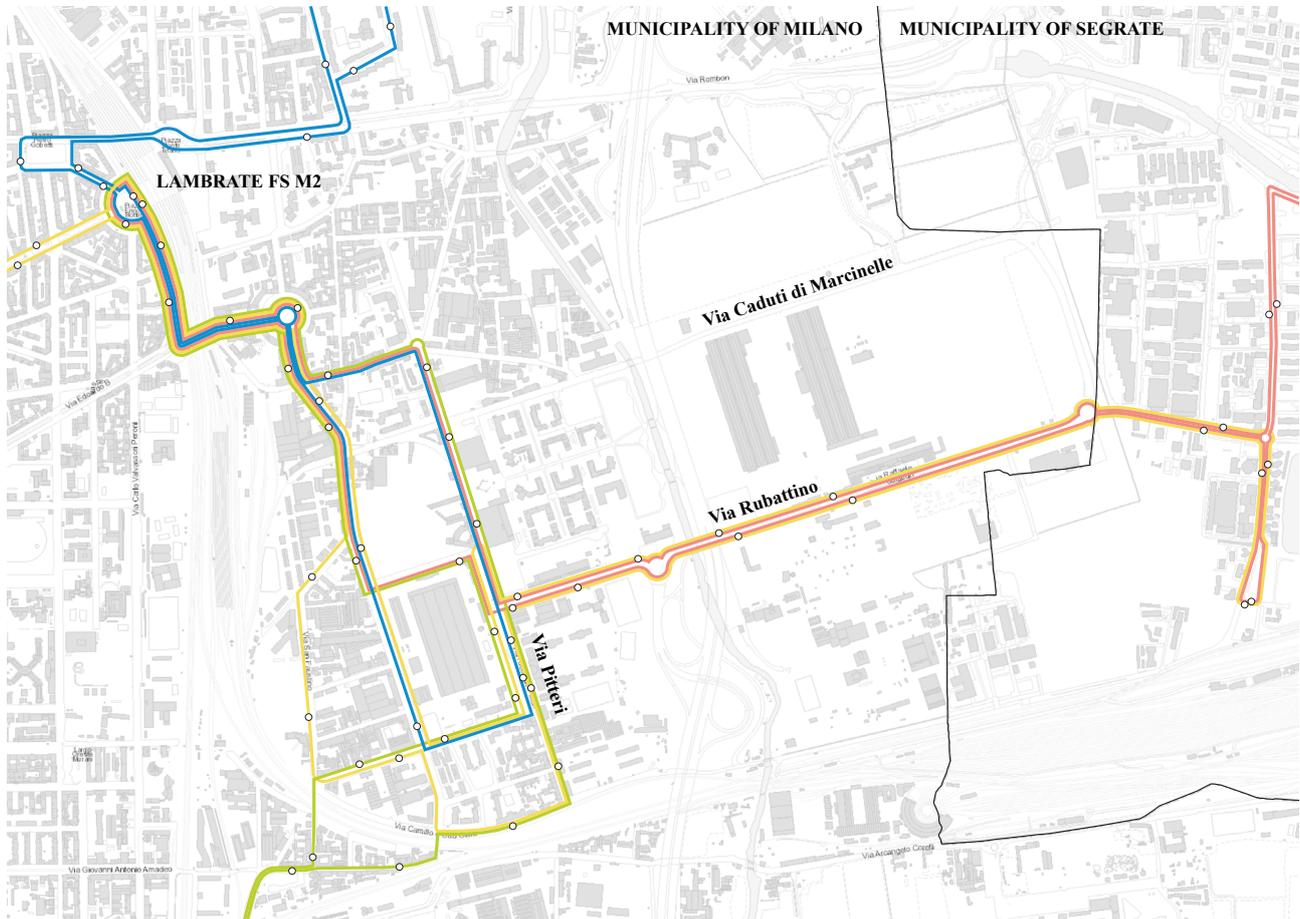
It should be noted that the Sustainable Urban Mobility Plan (PUMS) of the Municipality of Milan approved in 2018 provides for the redevelopment of Piazza Monte Titano and the interchange car park at Lambrate FS M2 railway station. The project envisages a new interchange car park and the reorganisation of the surface of the spaces that will accommodate authorised Local Public Transport (LPT) and Gran Turismo (GT) buses, company shuttles, a bike park and areas for users and drivers.

2.4.3 PUBLIC TRANSPORT SYSTEM

The Competition area is about 2 km from the **Lambrate FS railway station**, a modal interchange hub with the **M2 metro line**, and is served within a radius of

500 m by urban (39 - Loreto / Pitteri; 54 - Lambrate FS M2 / Duomo; 75 - C.na Gobba M2 / Pitteri) and suburban (924 - Lambrate FS M2 / Segrate) bus lines (fig. 17).

fig. 17
Diagram of the existing public transport system.



Lines 39 and 924 run along Via Rubattino.

Line 39, in addition to the standard Loreto/Pitteri route, runs a few times a day to/from the Redeciesio district. The service runs from Monday to Friday, during peak morning and afternoon hours and when schools are closed, with a frequency of 10 to 15 minutes.

Line 924, on the other hand, connects the Lambrate FS M2 railway station with the Municipality of Segrate, along Via Rubattino, with a service operating from 6.25 am to 11.50 pm and a frequency of 5/7 minutes at peak times on weekdays. Both lines are served by 12-metre long buses.

Lines 54 and 75 run along Via Pitteri.

Line 54 has a morning peak frequency of 4/5 minutes and a service span from 6 am to 2.30 am, and on Friday and Saturday nights it offers continuous service through the night line N54.

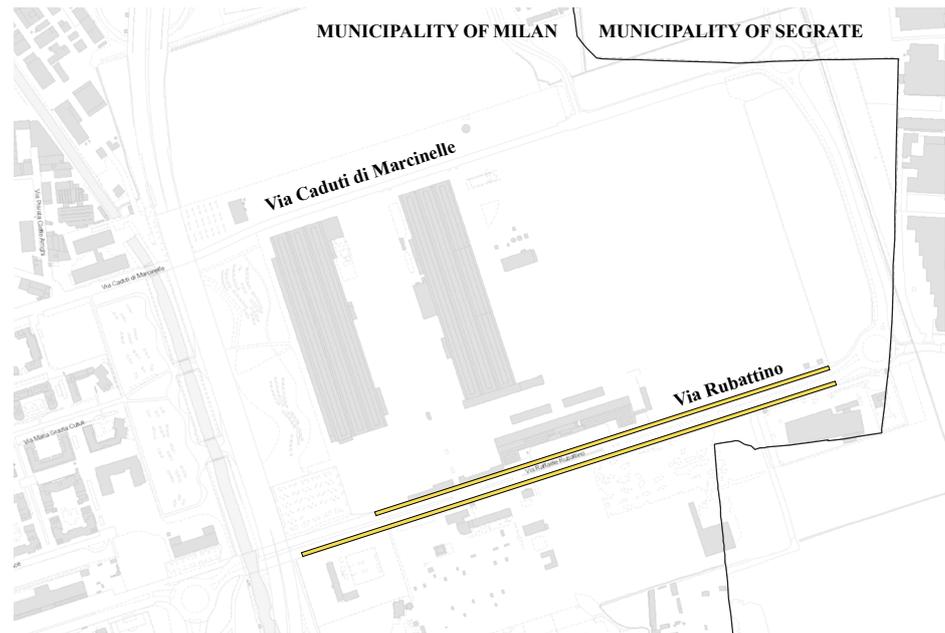
Line 75 runs along Via Pitteri only on direct trips to Cascina Gobba, with a frequency of 20 minutes for almost the entire service.

Along Via Rubattino, in the section east of the ring road, there is currently a lane reserved for local public transport vehicles and taxis in both directions, which is also accessible to motorbikes and bicycles in both directions (fig. 18).

Legend

- 39 - Loreto / Pitteri
- 54 - Lambrate FS M2 / Duomo
- 75 - C.na Gobba M2 / Pitteri
- 924 - Lambrate FS M2 / Segrate

fig. 18
Diagram of lanes reserved
for LPT and taxis along
Via Rubattino.



Since the Rubattino area will be used mainly for logistical functions, with access from Via Rubattino, at present there are no advantages to the passage of public transport in Via Caduti di Marcinelle: in fact, there are plans to use the Via Rubattino axis as a pole of attraction for which it will be essential to have a fast LPT service, more frequent than the present one, in order to respond effectively to the new users generated, favouring the use of public transport over private transport.

2.4.4 CYCLING PATH NETWORK

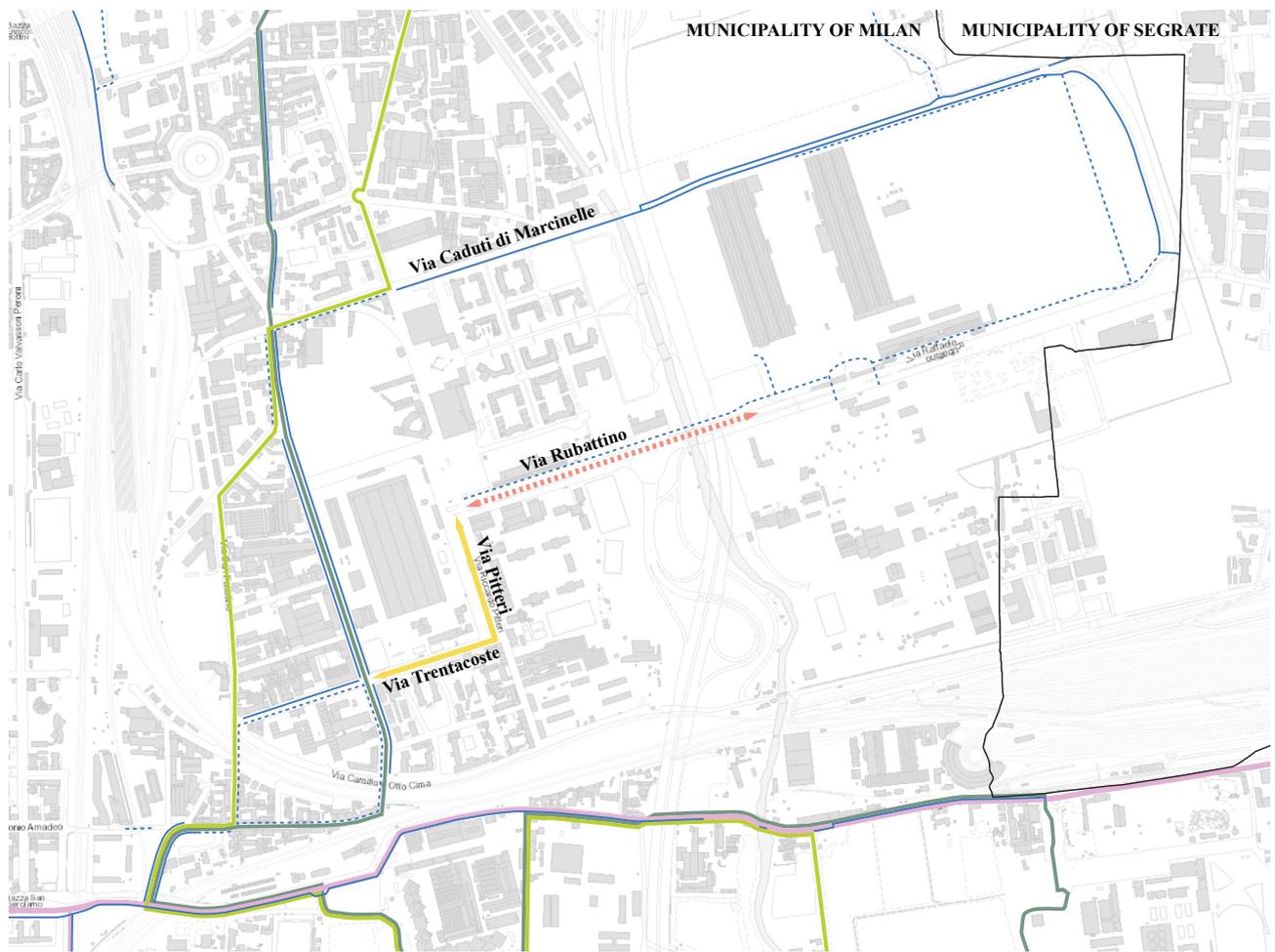
The PUMS identifies a number of main cycling routes, which are complemented with widespread cycling and traffic calming measures (30 zones) to make mobility safer at district level. In 2020, in response to new needs related to the Covid-19 health emergency, active mobility planning and programming activities were directed towards identifying new cycling routes, also for the connection with the first ring municipalities. Among these routes, one has been created between the City of Milan and the Municipality of Segrate, which involves the Ortica and Lambrate districts and the Rubattino area. The new route connects to the south with the existing Cavalcavia Buccari cycling path which, along the Viale Argonne, Corso Plebisciti and Corso Indipendenza routes, leads directly to the city centre; while to the north it connects with the Lambrate district, specifically the railway station. Due to the characteristics of road sections and the presence of local public transport, the route consists of some sections of cycling lanes and moderate traffic lanes along the following streets: Caduti di Marcinelle, Crespi, dei Canzi, Bistolfi, San Faustino, Ortica, and along Cavalcavia Buccari.

The extension of the district diffuse cycling network is being assessed (fig. 19), through interventions along Via Rubattino and a possible further connection

with two one-way cycling lanes along Via Pitteri and Via Trentacoste (in yellow), to create a direct connection between the Municipality of Segrate, the Ortica district and the Argonne - Buccari cycling path. Specifically, the aim is to guarantee a cycling-pedestrian connection between the areas east and west of the River Lambro, creating a continuous and safe route along Via Rubattino (in red), with the consequent need to redevelop and make safe the passage under the ring road viaduct and over the river, the crossing of Via Caduti in Missione di Pace, the overcoming of the roundabout and the continuation to Via Pitteri.

It should be noted that in the Municipality of Segrate, on the border with the Municipality of Milan, Via Rinaldo Piaggio and Via Milano already have cycling lanes. The district is also crossed by the “Abbracciami”¹² cycling route.

fig. 19
Diagram of the extension of the cycling network (under evaluation).



- Legend
- existing cycling routes
 - - - planned cycling routes
 - PUMS network
 - Abbracciami

¹² For further details, see the link: <https://www.bici.milano.it/abbracciami/>

SUBJECT OF THE COMPETITION

The Competition area is defined in annex “3.2 Tavole con perimetrazione area di Concorso” and is characterised by the presence of two perimeters:

3.1 PERIMETER 1

- TECHNICAL AND ECONOMIC FEASIBILITY PROJECT

The area identified by the red perimeter consists of two Areas:

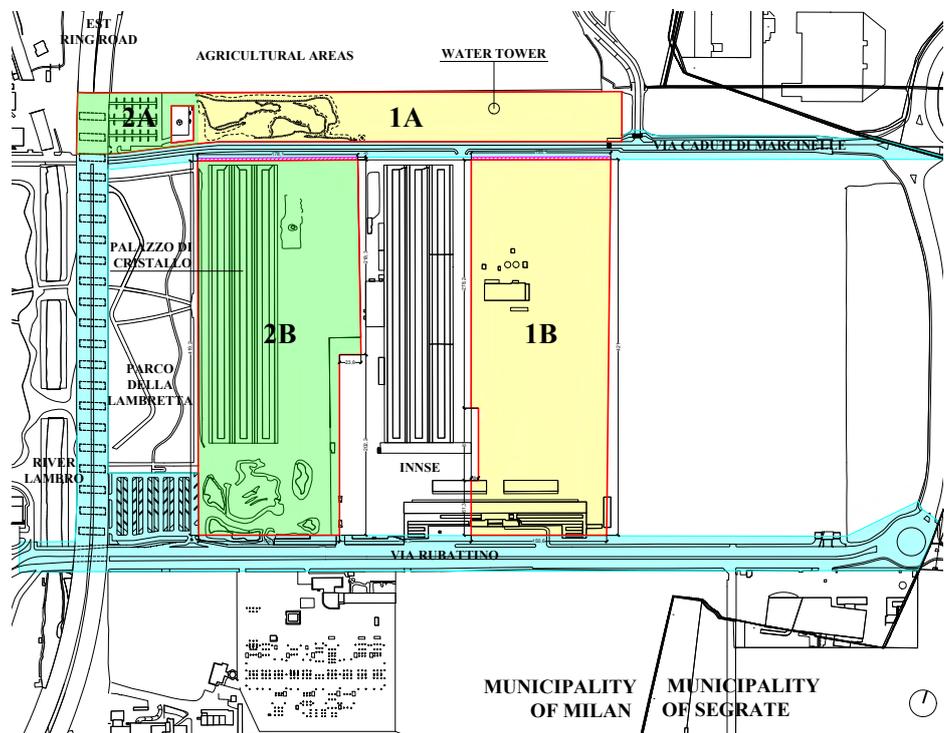
- **Area 1** (with yellow background), inside which there are plans for the new site of the Teatro alla Scala laboratories and warehouses and related outdoor spaces;
- **Area 2** (with green background), inside which there are plans to expand Parco della Lambretta.

For the two Areas, the elaboration of a technical and economic feasibility project (PFTE) is required.

In particular, the development of two scenarios is required:

- **Scenario I** (fig. 20)

fig. 20
Scenario I.



In Scenario I, **Area 1** is divided into two sub-areas (1A and 1B), separated by Via Caduti di Marcinelle:

- **sub-area 1A**, of approx. 26,250 m², is located north of Via Caduti di Marcinelle. It is bordered to the west by a district heating substation, to the east by the north-south road linking Via Caduti di Marcinelle to Via

Rombon and to the north by private agricultural areas. It is characterised by the presence of a Water Tower, the maintenance of which should be assessed without compromising the functionality of the planned activities;

- **sub-area 1B**, of approx. 63,660 m², located south of Via Caduti di Marcinelle, is bordered to the south by Via Rubattino and to the east and west by private areas (the area to the west is characterised by the presence of the INNSE factory, which will be flanked by a centre for research, training and technological and economic innovation; the area to the east will house production/logistics and tertiary/directional functions).

In this Scenario, the functionality and connection of the Teatro alla Scala laboratories and warehouses shall be guaranteed, as better specified in subparagraph 4.1.3.

Area 2 consists of two sub-areas (2A and 2B), separated by Via Caduti di Marcinelle:

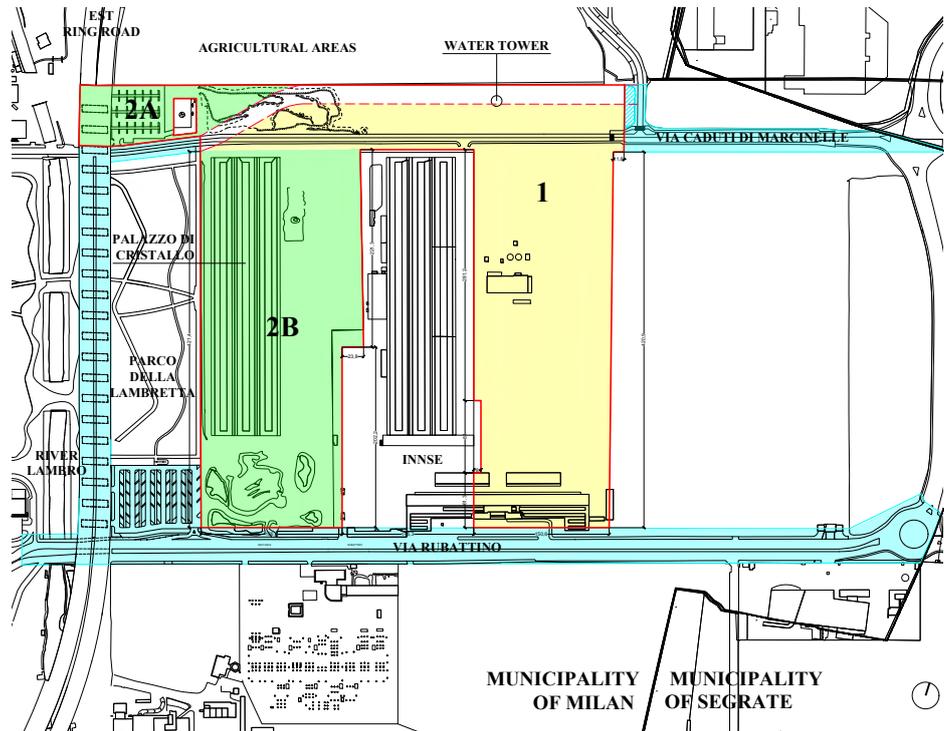
- **sub-area 2A**, of approx. 7,690 m², is located north of Via Caduti di Marcinelle and is bordered to the east by the district heating cabin and to the north by private agricultural areas. It includes the space under the viaduct of the east ring road, which is to be enhanced and the adjacent parking area, which is to be depaved to create a new green area;
- **sub-area 2B**, of approx. 70,880 m², characterised by the presence of the so-called “Palazzo di Cristallo”, is bordered to the north by Via Caduti di Marcinelle, to the south by Via Rubattino, to the east by the INNSE factory and to the west by Parco della Lambretta. The area is to become a park and competitors are requested to preserve and recover, even partially, the so-called “Palazzo di Cristallo”, as an integral part of the park, i.e. its vegetation, as better specified in subparagraph 4.4.3.

Competitors are also required to guarantee permeability between the park planned in sub-area 2B and the agricultural areas to the north of sub-area 1A, assessing the maintenance of an open space in sub-area 1A, where the design of the buildings is able to create an ecological connection and a landscape relationship with the surroundings, while guaranteeing the functionality of the Teatro alla Scala laboratories and warehouses.

It should be noted that the north border of the area where the INNSE factory is located, will be shifted by 3 m to guarantee easy access for vehicles to the eastern side of the shed. In Scenario I, competitors are asked to assess whether to include the areas useful for the realignment of the front along Via Caduti di Marcinelle in the PFTE areas, by annexing them to the sub-areas 1B and 2B, or by annexing them to the areas included in the Guidelines, i.e. in the redevelopment of the road layout, as better specified in annex 3.2 “Tavole con perimetrazione area di Concorso”.

• **Scenario II** (fig. 21)

fig. 21
Scenario II.



In Scenario II, competitors are asked to **merge sub-areas 1A and 1B, provided for Scenario I, into a single area (Area 1)** of 85,470 m², moving to the north the layout of Via Caduti di Marcinelle, whose role as a local inter-zonal road should be maintained. The proposal for the new layout must guarantee the continuity of the existing cycling path and must not include the passage of heavy goods vehicles. In both scenarios, heavy vehicles will only have access to the new site for the Teatro alla Scala laboratories and warehouses from Via Rubattino. Accesses along Via Caduti di Marcinelle may also be reserved for light vehicles only.

In Scenario II, **sub-area 2A** will be approx. 11,470 m² and the **sub-area 2B** will be approx. 70,880 m². Also in this Scenario, competitors are required to guarantee permeability between the new park and the agricultural areas to the north to ensure an ecological connection and a landscape relationship with the surroundings.

In both scenarios, moreover, in the estimation of the works for the expansion of Parco della Lambretta an amount dedicated for the necessary connection with the existing park has been included.

3.2 PERIMETER 2 – GUIDELINES

In addition to Perimeter 1, which is the subject of PFTE, areas with a blue background have been identified, for which competitors are required to develop a project at guideline level for the urban space.

Specifically, along **Via Rubattino**, the following is required:

- the creation of a continuous and safe cycle-pedestrian path, linking the existing cycle paths in Via Milano and Via Piaggio in the Municipality of Segrate and Parco della Lambretta, including the passage under the viaduct and over the River Lambro, up to the intersection with Via Caduti in Missione di Pace. This path, which can be extended as far as Via Pitteri must be separate from the traffic flows of Via Rubattino by a tree-lined green area;
- the creation of a traffic-lighted flush intersection at the entrances to the INNSE factory and the new site of the Teatro alla Scala laboratories and warehouses, so as to:
 - encourage direct access to compartments;
 - contribute to moderate speed along the road;
 - make it possible, by means of driveway to the north of Via Rubattino, for vehicles arriving from the sectors on the southern side of Via Rubattino (e.g. CESI) and heading towards the city centre or the east ring road to “turn back”, thus avoiding the need to reach the roundabout on the border with the Municipality of Segrate to turn back;
 - improve communication between the two road fronts by means of protected pedestrian crossings in the immediate vicinity of LPT stops.

With regard to the **ground-level parking area along Via Rubattino**, near the viaduct of the east ring road, it should be maintained to guarantee a parking area sufficient to absorb any parking demand generated by the planned transformations, if it cannot be relocated elsewhere. Proposals are also requested for the redevelopment of the parking area, in view of the expansion of Parco della Lambretta, and for the implementation of green areas.

In addition to these areas, there are the **spaces under the viaduct of the east ring road** (fig. 22), which play a fundamental role in connecting the eastern and western parts of Parco della Lambretta and which are currently little used. Proposals are required to enhance these spaces, for example through lighting or new murals with pollutant-absorbing paints, and possibly to assess the creation of new water elements and/or the inclusion of new functions, in compliance with the current legislation. Competitors are invited to take into account that in the space below the first four spans starting from Via Rubattino, near the existing parking area, the construction of a skatepark is being evaluated in relation to the regulations in force.

fig. 22
Spaces under the east ring road
viaduct.
Source: Municipality of Milan



In particular, for **Via Caduti di Marcinelle** (fig. 23), in case of its maintenance as foreseen in Scenario I, Perimeter 1, competitors are requested to assess the enhancement of the existing layout, guaranteeing the continuity of the cycle path and providing pavements, where absent, and pedestrian crossings, in order to improve communication between the two road fronts.

fig. 23
Via Caduti di Marcinelle,
view looking east from
Parco della Lambretta.



DESIGN INDICATIONS

The project proposal for the new site of the Teatro alla Scala laboratories and warehouses (Area 1) and for the expansion of the Parco della Lambretta (Area 2) must be characterised by an adequate architectural and landscape articulation and must satisfy a series of general requirements, which are fundamental to guarantee the effectiveness of the project as a whole. These indications are valid for both scenarios.

4.1 NEW SITE OF THE TEATRO ALLA SCALA LABORATORIES AND WAREHOUSES**4.1.1 RELATIONSHIP WITH THE CONTEXT**

From the point of view of the composition, the complex of the Teatro alla Scala laboratories and warehouses should have its own recognizability and identity, becoming a point of reference for the district and the city, able to give an impulse to the regeneration of the former Innocenti area.

It should be easily accessible from Parco della Lambretta and the two main roads: Via Rubattino and Via Caduti di Marcinelle. Its image should be that of a place open to the district and the city, culturally alive, whose aim will be to bring citizens closer to world of the Teatro alla Scala. The various parts of the complex should be clear and easily identifiable, as should the accesses and routes, in order to facilitate the orientation and movement of the different categories of users, whether visitors or workers. Pedestrian and vehicle accesses must be differentiated. Driveways must be equipped with automated 5-metre openings. It will be essential to ensure easy movement of vehicles within the complex and parking areas will have to be provided within Area 1 for the following vehicles: no. 5 9-metre trucks; no. 4 minibuses; no. 3 vans; no. 2 cars. For security reasons, the complex must be equipped with a perimeter fence.

It is requested to evaluate the creation of a public open space, which will precede the main entrance to the complex, as permeable as possible and to be used as a square/garden (rain garden, water square, etc.) in which the external paths will converge, including the cycling/pedestrian paths coming from the Lambrate district, from Parco della Lambretta and from the Municipality of Segrate.

4.1.2 FUNCTIONAL PROGRAMME

The functions to be provided in the new complex of the Teatro alla Scala are listed below. For the organisation of functions and their possible location, see subparagraph 4.1.3.

The height of the new building will vary between 21 and 25 metres. This height and those below for the various spaces are net heights and therefore refer to the distance between the floor level and the soffit of the building.

The surfaces indicated for each space are net of external perimeter walls and internal partition walls.

- **Laboratories**, totalling 33,500 m²:
 - **Set design**, of about 5,200 m², with a height of 15 m, to be organised on one floor. This is where the scenes are assembled. Large open spaces are needed to lay stage backdrops on the ground (18x25 m), usually two or three at the same time. The set design department must have at least no. 2 rooms in which colours for the various processes are prepared, each measuring at least 30 m², and no. 1 storeroom of about 300 m².
 - **Stage plastics**, of about 700 m², with a height of 7.5 m (15 m in the part of the internal corridor, described in subparagraph 4.1.3), to be organised on one floor. In this department, plastics are processed by shaping sheets on special moulds through heat with pressure and suction. No. 1 storeroom of about 100 m² must be provided inside.
 - **Sculpture**, of about 1,800 m², with a height of 15 m, to be organised on one floor. In this department, in addition to the large statues, all the surfaces covering the scenes, such as rocks, trees and various architectural elements, are made.
 - **Mechanical workshop**, of about 2,100 m², with a height of 15 m, to be organised on one floor. In this department, metal components that generally support wooden and sculptural elements are machined, assembled and mounted. Each artefact is made from 1:1 scale drawings. No. 1 storeroom of about 300 m² must be provided inside.
 - **Carpentry**, of about 4,200 m², with a height of 15 m, to be organised on one floor. In this department, wooden components are machined, various scenic elements are built and sets are assembled. Each artefact, with prototype and unique product characteristics, is made from 1:1 scale drawings. No. 1 storeroom of about 500 m² must be provided inside.
 - **Wardrobe**, of about 12,000 m², with a height of 5 m, which can be organised on one or more floors. Here, the costumes to be used on stage are designed, made and tried on. It is divided into several rooms, possibly to be maintained on one floor:
 - laundry room (300 m²);
 - millinery room (250 m²);
 - knitwear room (500 m²);
 - cutting room (200 m²);
 - fabric storeroom (600 m²);
 - costume sewing room (350 m²);
 - underwear sewing room (350 m²);
 - sampling room (250 m²);
 - costume design room (400 m²);
 - fitting rooms (300 m²);
 - temporary storeroom (300 m²).

The remaining m² are to be used as common connecting spaces between the different rooms.

On the upper floors it is possible to organise the costume storage (8,000 m², of which 150 m² for the costume archive), where approx. 80,000 costumes will be stored in wardrobes and showcases.

- **Tool storage**, of about 5,600 m², with a height of 7.5 m, which can be organised on two floors, each with 2,800 m². This department is dedicated to the storage of all the stage accessories (tables, chairs, crockery, etc.) and costume accessories (swords, helmets, etc.). There will be specific containers and shelving inside.
- **Equipment design**, of about 1,400 m², with a height of 5 m. In this department elements necessary for the completion of scenes and costumes, such as masks, armour, swords, helmets and wings, are worked on, painted and graphically processed.
- **Upholstery**, of about 200 m², with a height of 5 m. Curtains are processed in this department, as well as stuffings and coverings made of fabric, leather or other materials for furniture used on stage.
- **General storeroom**, of about 300 m², with a height of 4 m, to be organised on one floor.

- **Rehearsal rooms and multifunctional room**, totalling 9,310 m²:
 - no. 2 **Rehearsal rooms for the choir**, of about 350 m² (approx. 22x16 m) and about 550 m² (approx. 22x25 m), with a height of 12 m. The request to have two rooms of different sizes is related to the need to rehearse in groups or for vocal sections. The largest room must be equipped with tiers (120x20 cm) and must accommodate a maximum of 120 people, arranged in 6 rows. The smaller one, which is also tiered, will accommodate a maximum of 60 people. Within each room there should be sufficient space for a piano. Particular attention should be paid to acoustics and soundproofing.
 - n. 1 **Rehearsal room for the orchestra**, of about 660 m² (approx. 22x30 m), with a height of 12 m. The room must accommodate a maximum of 150 people. Particular attention should be paid to acoustics and soundproofing.
 - n. 1 **Rehearsal room for direction**, of about 3,750 m² (approx. 50x75 m), with minimum height of 21 m (maximum height of 25 m, as tall as the soffit of the building). The space must be equipped with a stage similar in size to the one inside the Teatro alla Scala, where it will be possible to assemble some scenic elements or simulate their size in order to allow the directors to set the first movements in the stage space. In this room it will be necessary to rehearse three scenes simultaneously. On the short side of 50 m, provision should be made as follows: 25 m for the stage; 5 m for a passage behind for storing stage equipment; 20 m of space in front of the stage, which can be mezzanine to allow visitors to attend rehearsals. It is necessary to guarantee a minimum 30 m wide, full-height span for the stage and the passage behind.
 - n. 1 **Multifunctional room**, of about 4,000 m², with minimum h. 21 m (maximum height of 25 m, as tall as the soffit of the building), intended

to host various kinds of event (exhibitions, fashion shows, concerts, etc.), inside which it will be possible to mount sets used during shows in the theatre. Competitors are asked to provide very wide spans to ensure a certain flexibility within the room. In addition, the room should be completely autonomous and equipped with a separate entrance, a cloakroom and toilets, as it is envisaged that it could be rented to third parties on particular occasions.

- **Offices and services**, with heights of 3 to 5 metres, which can be located in the reception block and above those laboratories which are not at full height.
 - **Offices**, which include:
 - no. 12 individual offices for department chiefs equipped with PC workstations, each of about 15 m² and a height of 3 m. A private bathroom should be added to each office. Specifically, no. 2 offices will be required for each of the following departments: set design, stage plastics, sculpture, mechanical workshop, carpentry and wardrobe. In the wardrobe, offices must be provided within the sampling room.
 - Management offices to be located in the reception block:
 - no. 4 individual offices equipped with PC workstations for directors and staff, each about 15 m² and 3 m high;
 - no. 1 meeting room of at least 40 m²;
 - no. 2 collective workspaces, each of at least 20 m².
 - **Archive** of about 500 m² and a height of 5 m, located in the reception block, specifically near the Management offices. It should contain multimedia and paper material, such as drawings, sketches, etc., on compact shelves.
 - no. 60 **Changing rooms for technical staff**, each approx. 40 m² and with a height of 3 m, including bathrooms with min. 6 showers, each approx. 16 m². Each changing room can serve approx. 15 workers. They can be located near the entrance, in the upper part of the laboratories.
 - no. 8 **Changing rooms for choristers** including bathrooms with showers, each 75 m² and a height of 3 m. No. 4 for men and no. 4 for women are required. They will serve approx. 20 people. They are required to be located close to the choir rehearsal room and will be equipped with a dressing table and locker for each chorister.
 - no. 12 **Changing rooms for orchestra members** including bathrooms with showers, each 40 m² and a height of 3 m. No. 6 for men and no. 6 for women are required. They must be located close to the orchestra rehearsal room.
 - no. 1 **Orchestra instrument storeroom** of approx. 150 m² and a height of 3 m, to be located near the orchestra rehearsal room.
 - no. 24 **Dressing rooms**, each 15 m² and a height of 3 m, to which a bathroom has to be added. They will have a maximum capacity of 2 people and need to be located close to the rehearsal rooms and the multifunctional room.
 - **Canteen with kitchen**, reserved for workers, of about 700 m² and a height of 5 m. There must be at least 150 seats, and also toilets for users,

as well as changing rooms for staff. It must be connected to an access area for vans to easily load/unload goods. It must be organised on a single level and may be located on the top floor of the reception block; if it is planned elsewhere, on a floor other than the top floor, it must be equipped with appropriate extraction chimneys for the kitchen.

- **Bar and diner**, of about 600 m² and a height of 5 m. If possible, it should be located on the ground floor in the reception block and should be accessible from inside and outside for both visitors and workers.
- **Infirmary**, of about 70 m² and a height of 3 m. It will consist of a doctor's office (approx. 16 m²), a nurse's office (approx. 12 m²), an examination room (approx. 16 m²) and a bathroom. The infirmary must be easily accessible and located near the entrance on the ground floor of the reception block.
- **Entrance hall with concierge**. The size of this space will be at the competitors' discretion.
- **Toilets**. Given the size of the spaces to be designed, it is essential that each of the laboratory departments (set design, stage plastics, sculpture, mechanical workshop and carpentry) and warehouses have toilets for workers, divided into men and women, located at opposite ends of the space from the entrance to the department. Additional toilets must be provided for visitors, both in the reception block and along the tour route.
- **Warehouses**, with a height at the soffit of at least 18 m, up to a maximum of 21 m.
 - **Container area**. Approx. 2,500 containers, stackable on up to four levels, are to be accommodated and moved by overhead cranes. The containers will be 30 feet and are usually loaded with 1,000-1,500 kg of material.
 - **Sorting area**, to be located near the container area. This is a space where the material inside the containers is unloaded and then sorted, or where the material is loaded into containers to be shipped to other theatres. 16-metre long lorries must be able to enter and carry out manoeuvres in this space. It should therefore be equipped with vehicle entrances.
 - **Loose material area**, of about 1,000 m², where various kinds of material are stored. 9-metre long trucks must be able to enter and carry out manoeuvres in this space. It should therefore be equipped with vehicle entrances.
- **Technical rooms** of about 200 m², to be distributed as required, possibly by lofting some rooms or using the roof. Similar to the Laboratori Scala Ansaldo, for example, mezzanines can be designed inside the laboratories for various machines. The complex will also be equipped with an electrical transformer cabin, since 5,000 kW of energy is needed, as further detailed in subparagraph 4.1.7.

4.1.3 ORGANISATION OF SPACES AND ROUTES

The new complex should first and foremost be a comfortable and functional place, with a clear organisation of spaces and routes.

Two organisation charts are shown below (figs. 24-25) which aim to explain to competitors the relationships between the different functions. These charts do not necessarily have to coincide with the competitors' project proposal.

Internal and external routes should be as short as possible, easily identifiable right from the entrance/reception block, in order to guarantee users immediate orientation.

The new complex must be accessible in a simple and direct manner, and in particular it must guarantee that people with reduced motor and/or sensory capacities can use services and spaces in conditions of adequate safety and autonomy, according to the **principles of universal design** and reasonable accommodation with reference to the Plan for the Elimination of Architectural Barriers of the Municipality of Milan (P.E.B.A. MI)¹³. In addition, a distinction should be made between routes for visitors and those for workers.

Set design, stage plastics, sculpture, mechanical workshop and carpentry laboratories must be arranged in this precise order and must be connected by an internal corridor with fire doors (currently those in the Laboratori Scala Ansaldo are 12 m high) for the passage of both goods and workers. Wardrobe, tool storage, equipment design and upholstery departments can possibly be located above the aforementioned laboratories. The general storeroom is to be located on the ground floor. Set design, stage plastics, sculpture, mechanical workshop, carpentry, multifunctional room, rehearsal room for direction, rehearsal room for the orchestra and warehouses must be located on the ground floor and must have an opening to the outside to ensure accessibility to trucks and facilitate loading/unloading operations.

In Scenario I, if it is decided to locate part of the container area in sub-area 1A and part in sub-area 1B, on both sides of Via Caduti di Marcinelle, competitors are asked to consider the possibility of providing the complex with an **aerial connection** between the two areas, equipped with an automated system to transfer containers from one sub-area to the other. The connection must be at least 3.5 m high and 3.5 m wide, taking into account that 2.5 m is the width of a container on a rack and 1 m is the minimum space required for the passage of workers. The length will depend on the distance between the buildings designed in the two sub-areas. As far as the height above ground is concerned, it will be necessary to guarantee the passage of all kinds of vehicles along Via Caduti di Marcinelle.

Competitors are asked to pay particular attention to the structure and division of the **spans**. The structures of the warehouses, set design, stage plastics, sculpture, mechanical workshop, carpentry and rehearsal room for direction must have enough span to optimise spaces and, in particular, the number of overhead cranes. The latter will start and end in each room and, if a room is

¹³ See the link: <https://www.comune.milano.it/aree-tematiche/urbanistica-ed-edilizia/piano-eliminazione-barriere-architettoniche-peba>

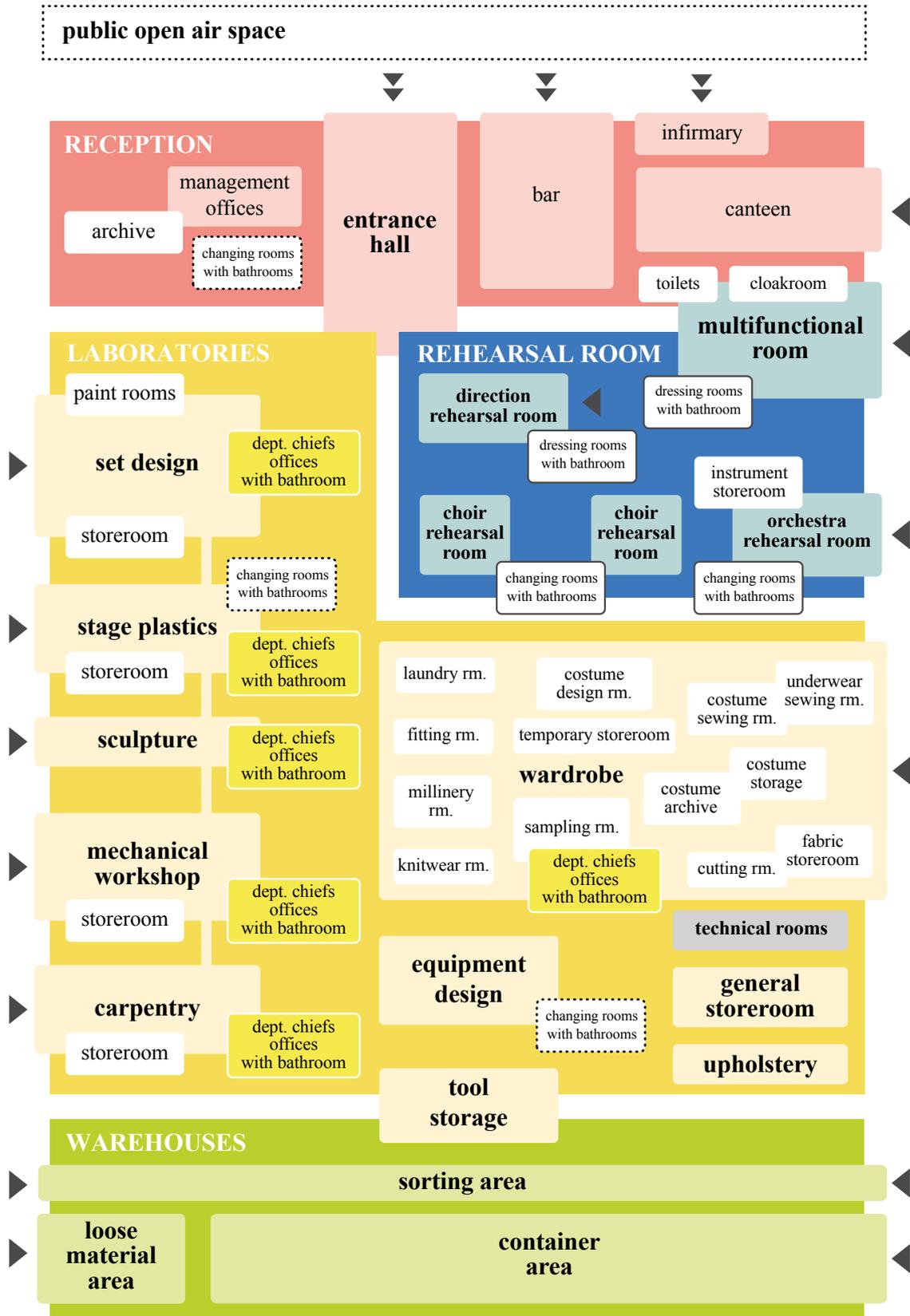
Legend

- ▶▶ pedestrian access
- possible location

- ▶ driveway access for loading/unloading through large openings

fig. 24

Organisation chart of relationships between functions.



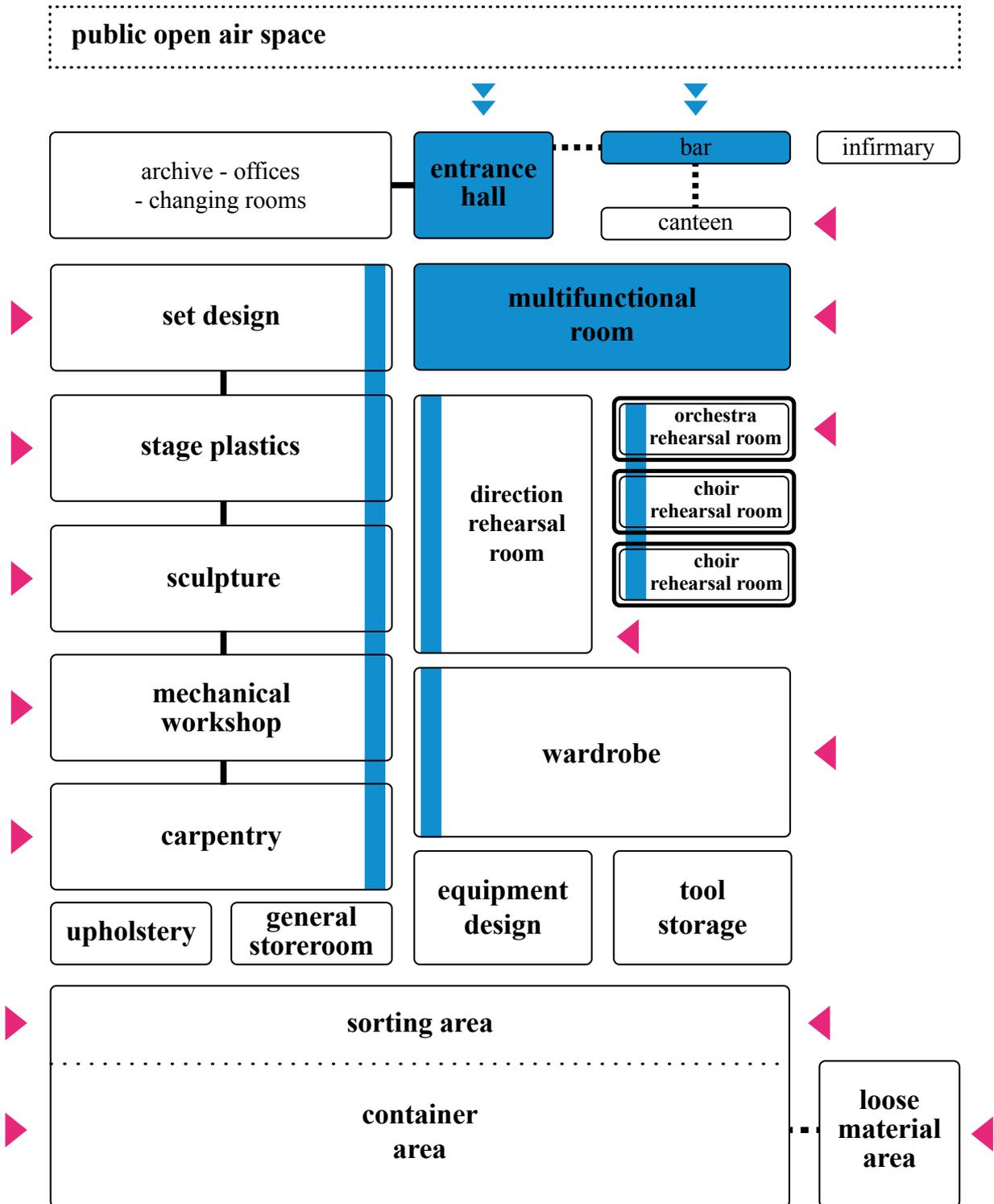
Legend

- required connection
- ⋯ possible connection
- ▶▶ pedestrian access for visitors
- ▶ vehicular access

- space accessible to visitors
- ▬ soundproofed space
- ⋯ possible internal divisions

fig. 25

Organisation chart of accesses and routes.



divided into several spans, each span must be equipped with an overhead crane. Specifically, in the warehouses it is necessary to equip the structures with sliding rails for overhead cranes that will be automated with a capacity of 30 tonnes. The aforementioned laboratories and the rehearsal room for direction must be equipped with overhead cranes, also automated, with two trolleys with hooks and a capacity of 5 tons per hook. A span width of 25 to 30 metres is recommended in these spaces (a width of 29 metres is considered optimal, particularly in the container area). Please note that the supply of overhead cranes is excluded from the total sum of the works to be carried out.

Entrance hall with concierge, infirmary, offices, archives, canteen with kitchen, bar and diner and any changing rooms, forming part of the reception block, can be organised in height. With reference to the two organisation charts (figs. 24 -25), it is suggested that competitors provide a covered connection/distribution corridor, at least 3.5 m wide, which, from the reception block, connects all the various laboratory departments and the sorting area and allows the movement of workers and the material needed for the various processes by means of trolleys or vehicles. Similarly, a wider connection (6 m wide) could be provided between the rehearsal rooms and the wardrobe.

Rehearsal rooms for choir and orchestra must be soundproofed. Competitors are invited to assess the positioning of the orchestra instrument storeroom and the changing rooms for the orchestra members (h. 3 m) below the choir rehearsal rooms (h. 12 m) and the changing room for choiristers (h. 3 m) above the orchestra rehearsal room (h. 12 m). Between the rehearsal rooms, vertical connections such as stairs and lifts/elevators can be placed in a space of at least 4 m wide, which will also help to improve the acoustic insulation of the respective rooms. It is essential that the changing rooms for the choristers are in close proximity to the choir rehearsal rooms and that the changing rooms for the orchestra and instrument storeroom are in close proximity to the orchestra rehearsal room (fig. 26).

fig. 26
Functional diagram
(cross-section) of rehearsal
rooms and related services.



The interest shown by visitors at the Laboratori Scala Ansaldo should be enhanced and encouraged by creating new **possibilities of visits for the public**, for example by allowing access to stage rehearsals, laboratories, exhibitions or various events. Visitors should be able to access the departments that are part of the complex and see the work in progress by means of a dedicated

route, possibly elevated and ring-shaped (starting and ending in the reception block), similar to what happens in the Laboratori Scala Ansaldo. Competitors are asked to think of aerial walkways around the perimeter of the different rooms at a height of about 5 m, which can become 2.5 m for the wardrobe. The width of the walkways shall be at least 2.5 m. In the rehearsal room for direction it is requested to assess the possibility of creating a mezzanine from which the public can attend the stage rehearsals without interfering with the work of artists and various operators.

Focus

THE LABORATORI SCALA ANSALDO

Below a description of the Laboratori Scala Ansaldo is provided for a better understanding of the current organisation of the various functions.

Since February 2001, the Teatro alla Scala laboratories have been located in the former Ansaldo steelworks at 34 Via Bergognone in Tortona district, in Milan (fig. 27).

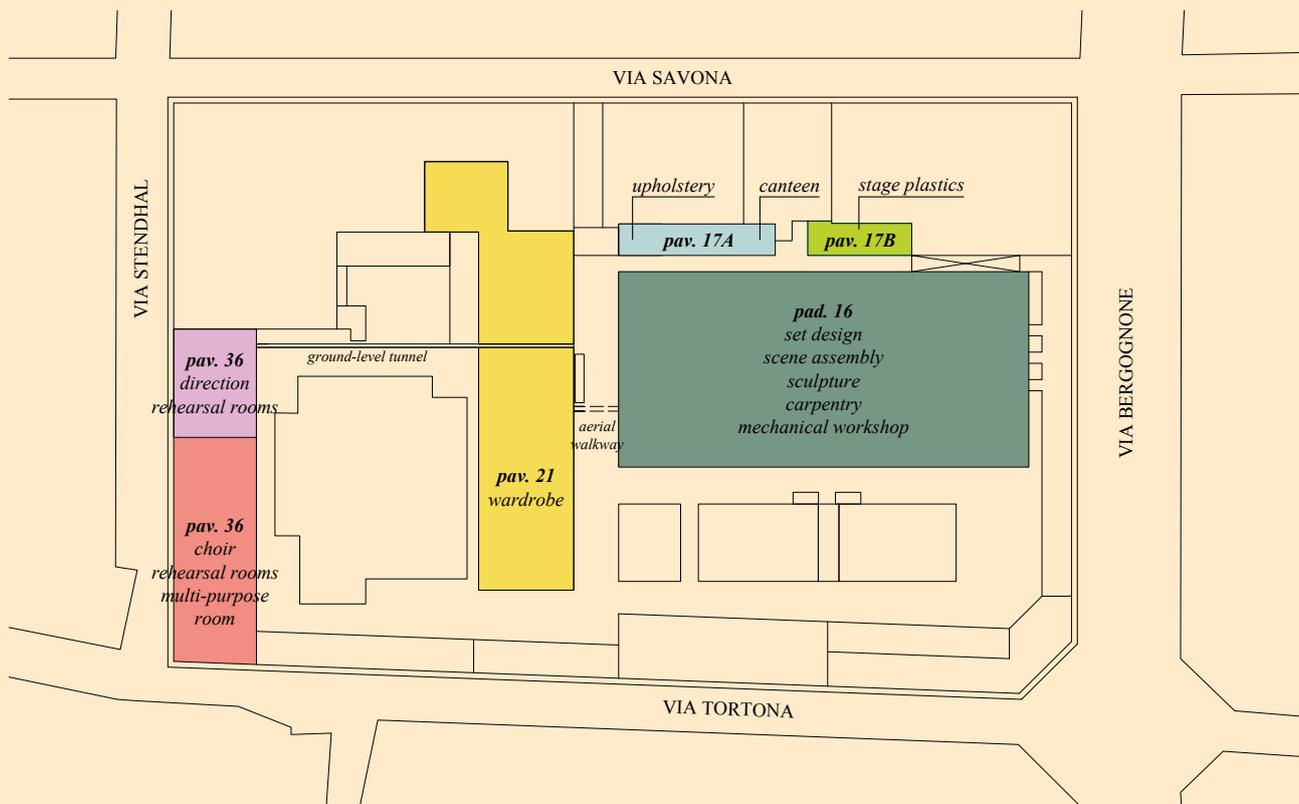


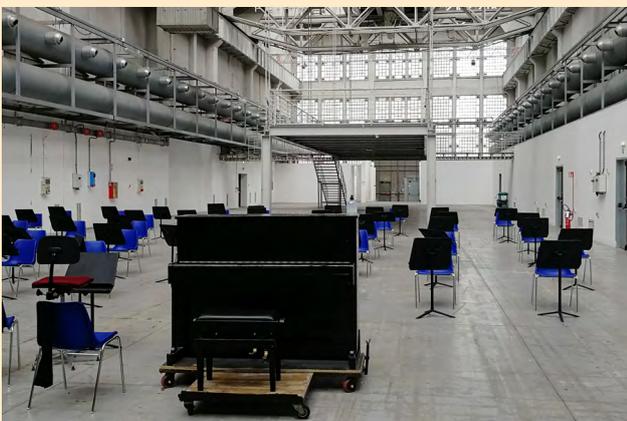
fig. 27
Diagram of the Laboratori Scala Ansaldo.

It is an imposing structure of about 20,000 m², divided into three main pavilions: Benois, Caramba and Visconti.

Inside the **Benois pavilion** (pav. 16) most of the handicraft work of the stage set-up takes place: set design (fig. 28), scene assembly (fig. 29), sculpture, carpentry and mechanical workshop. The stage plastics is located in an adjacent building (pav. 17B).

In the **Caramba pavilion** (pav. 21) there is the wardrobe (fig. 30), which houses the costume sewing room and design room, the costume fitting room, the laundry room and the costume storage (fig. 31), where there are more than 60,000 costumes.

In the **Visconti Pavilion** (pav. 36) there is a multifunctional room (fig. 32), two rehearsal rooms for the choir and a stage area for direction rehearsals (fig. 33), which corresponds in terms of size to the Piermarini stage in the Teatro alla Scala.



The Laboratori Scala Ansaldo currently employs more than 150 workers, including carpents, joiners, blacksmiths, set designers, set technicians, sculptors, seamstresses and costume designers, who are able to create the entire set or costumes for the stage from a simple sketch.

Laboratories are also open to the public and guided tours of about 60 to 75 minutes take place inside. Over the years this complex reality has aroused interest across various targets (professionals, schools, tourists, citizens, theatre enthusiasts, etc.) and before the health emergency an average of 8,000 visitors per year was recorded¹⁴.

¹⁴ For further details, please refer to the annex folder “Laboratori Scala Ansaldo” and the links: <https://www.teatroallascala.org/it/laboratori/ansaldo.html> and <https://artsandculture.google.com/story/il-laboratorio-ansaldo/XALyRAEu57h9Iq?hl=it>

fig. 28 (top, on the left)
Set design.

fig. 29 (top, on the right)
Scene assembly.

fig. 30 (centre, on the left)
Wardrobe.

fig. 31 (centre, on the right)
Costume storage.

fig. 32 (bottom, on the left)
Multifunctional room.

fig. 33 (bottom, on the right)
Rehearsal room for direction.

4.1.4 MOVEMENT OF VEHICLES AND PRESENCE OF PEOPLE

With regard to the **movement of vehicles**, in the area the following is expected:

- daily 2-3 trips (entry and exit) of 9-metre long trucks from 8.30 am to 6 pm;
- daily 3-4 trips (entry and exit) of minibus/van from 8.30 am to 7 pm;
- 7-8 times a year, for about 6-7 days at a time (entry and exit) of 3-4 trailer trucks from 8.00 am to 8.00 pm;
- 3 times a month, for about 3-4 days (continuous entry and exit) of 9-metre long trucks, from 11 pm to 7 am.

With regard to the **presence of people**, however, the following is expected:

- approx. 170 workers, every day for 11 months, from 8.30 am to 8.00 pm, of which about 50% from 8.30 am to 5.00 pm, and 30 workers from 0.00 to 6.00 am, 3 times a month for 3-4 days;
- approx. 70 orchestral members, approx. 110 choristers, approx. 40 extras/mimes and approx. 10 artists, from 10.00 am to 7.00 pm, 3 weeks a month for 10 months;
- approx. 15,000 visitors, from 10 a.m. to 4 p.m., spread over 11 months;
- 400-500 spectators from 10 am to 8 pm on weekends during events (exhibitions, fashion shows, concerts, etc.).

4.1.5 LIFE CYCLE OF BUILDINGS AND CONSTRUCTION METHODS

Considering the need to design using highly energy-efficient solutions with a view to minimising climate-changing emissions, attention must be paid to the issues of environmental sustainability and circularity of the building process steps, with a specific focus on the selection of materials and the choice of systems, in order to guarantee:

- disassembly;
- high content of recovered or recycled material;
- use of renewable materials;
- minimising the distance of supply of construction products in order to stimulate the circular economy.

The project proposal must take into account the Minimum Environmental Criteria (CAM), approved by Ministerial Decree of 11 October 2017, and solutions should be found that ensure the **lowest possible environmental impact throughout the life cycle of buildings**. To demonstrate compliance with CAM, the proposal may use national and international protocols on building sustainability. In general, the following aspects should be taken into account when designing the intervention:

- internal environmental quality;
- natural lighting;
- natural ventilation and room air quality;
- indoor pollution and healthiness of rooms by reducing indoor electromagnetic pollution and reducing emissions from materials;

- acoustic comfort;
- thermo-hygrometric comfort.

In order to minimise the environmental impact, in particular that of the construction process, preference should be given to **off-site works**, such as prefabrication, and to solutions that provide for selective demolition methods with assessment of the **maximum possible on-site reuse of resulting materials**.

In general, off-site works make it possible to reduce:

- production of materials and demolition waste;
- production of waste materials such as packaging;
- storage of construction site materials;
- impacts on surface and groundwater and catchment systems;
- impacts on the natural, landscape and historical-cultural resources present in the construction site area;
- production of noise and vibrations, due to the operations of excavation, loading/unloading of materials, cutting of materials, mixing of cement and dismantling;
- water consumption, improving waste water management on site;
- presence of dust and fumes;
- visual impact of the construction site.

The **use of BIM**, which facilitates the industrialisation of the entire construction process (Modern Methods of Construction - MMC), the subsequent management of the building organism through a Building Management System - BMS and the integration of appropriate monitoring and management systems for the building and its plant systems are key factors in ensuring the efficiency of the project.

4.1.6 MATERIALS AND FINISHES

Without prejudice to subparagraph 4.1.5, the materials of the new complex should be simple and as durable as possible. Competitors will have to assess those most suitable for the various environments, taking into account not only the aesthetic value but above all the functional value, considering the intrinsic characteristics of materials (e.g. soundproofing) and the best way in which they can be used and associated with the various craftworks envisaged.

In general, **industrial finishes are required in the laboratories and warehouses, while in the services, residential finishes are allowed.**

In the laboratories (except in the wardrobe) and in the rehearsal room for direction, wooden floors are required, which are ideal for the easy maintenance: keep in mind that in the set design, nails are driven into the ground to fix the stage backdrops, which requires frequent replacement of the planks. Ventilated floors should be provided to facilitate and speed up the drying process of the paint applied to the backdrops. In the wardrobe, on the other hand, the floor must be easily washable, so stone tiles are preferable. The floors of other rooms will be at the competitors' discretion.

The floors of the rehearsal room for direction and the laboratories (except the

wardrobe) are required to support 700 kg/m², and those of the costume storage in the wardrobe, the tool storage and the archive in the reception block are required to support 600 kg/m².

In the wardrobe, the various rooms can be divided by masonry walls, mobile partitions or eventually transparent walls. It is not necessary for the sorting area and the container area to be separated by walls: either a single space can be designed or a wire mesh can be provided as a partition element.

Where external windows are installed, the technological implications on internal temperature control should also be carefully considered. In the case of large windows or external reflective surfaces, a study must be carried out and presented to the National Civil Aviation Authority (ENAC) to assess the impact of the light reflection phenomenon, which may cause glare to pilots involved in landing or circling operations, in accordance with Art. 41 of Implementation Rules of the PGT Regulatory Plan.

4.1.7 SYSTEMS

All system choices must be aimed at ensuring the minimisation of energy consumption, as well as maximisation of the use of renewable energy resources. The architecture and size of the systems in the buildings may be an added value for the construction of building, respecting the regulatory constraints for the functional and operational safety.

The main project criteria for systems serving the building will be:

- **energy supply and connection to network installations:** the building shall be equipped with one supply for each type of installation to be connected to public networks. Supplies must be provided according to the indications given by the public network providers;
- **use of BEMS systems:** with this technology it is possible to monitor, control and regulate the systems remotely, thus ensuring maximum control of the comfort conditions inside the building and, at the same time, defining and monitoring the implementation of energy management strategies and reduction of operating costs thanks to the availability of information updated in real time. The Building Energy Management System (BEMS) introduces artificial intelligence into the building and enables innovative ways of automating, managing and remotely controlling installations. It consists of a hardware part, based on intelligent sensors that command and control the correct operation of systems, and a software part based on a cloud platform that monitors and optimises energy consumption in real time through the application of artificial intelligence logarithms;
- **electrical and lighting systems:** the rooms that will be designed must be classified, pursuant to current legislation, in order to define protection measures for direct and indirect contacts as required by technical regulations. The electrical system must be designed with zone-based architecture, by “zone” meaning the rooms and spaces with the same use or function. The individual zones must be equipped with protections, separated on different

circuits, and distinguished, for example, by light circuits and terminal energy sockets. The area of each zone shall be appropriate to the design reality with maximum dimensions indicated. Energy distribution must be designed to ensure that the installation can be maintained after its construction, allowing safe access to all components of the installation. In order to guarantee the resilience of the system, the terminal circuits must meet the criteria of subdividing the functional users of the activity; energy distribution must be designed to guarantee easy maintenance of the system, after its construction, allowing safe access to all the nodal elements, aiming to reduce inefficiency in the event of a fault or malfunction.

The lighting systems to be adopted for the lighting of the rooms must be identified using criteria and solutions to reduce energy consumption and, compatibly within the constraints of the architectural design, using natural lighting to the greatest extent possible. Blackout curtains are required in the rehearsal rooms for the choir and orchestra. Lighting requirements, in both normal and emergency operation modes, must comply with current technical standards. The design of the emergency lighting shall ensure the presence of emergency lighting in all areas of the building containing equipment on which it is necessary, or possible, to perform manoeuvres to restore normal operating conditions. Given the citizens' growing sensitivity towards electrical mobility, the project must also evaluate the possibility of positioning charging stations for e-bikes;

- **systems powered by renewable energy sources:** in accordance with current regulations, the building must have energy production plants powered by renewable sources. Given their typical location on the roof of the building, said plants must be designed in such a way as to guarantee the possibility of carrying out maintenance and operational checks. In particular, the places where the equipment is installed must have the characteristics required for workplaces and must be safely accessible to operators;
- **building automation:** the presence of automatic systems, e.g. opening of main access doors and windows, is generally a requirement that improves the usability of the building for users. In the event of systems of this type, easy maintenance of the actuators must be guaranteed, preferably using complete systems available on the market and avoiding the use of automations that must be assembled. Safe accessibility by operators must also be guaranteed;
- **radio and television installations and antennas:** the project shall assess whether, in order to increase the offer to the public, to install reception devices for DVB and SAT TV channels;
- **electronic systems:** electronic systems, such as fieldbuses and regulation systems, must use open systems that use standard protocols. Open systems must be able to allow the connection of actuators and sensors, even from different component manufacturers. Conduits for electronic installations must be separate from those for electrical installations. The structure must be equipped with an anti-intrusion system, in accordance with current technical regulations, which can be managed remotely using the equipment provided by the Administration. In view of the intended use of the rooms, the project

will have to assess the possibility of equipping some rooms with public address systems to be used for rehearsals and/or events. In order to guarantee the flexibility of the amplification system, microphones must be of the radio frequency type. The building shall be equipped with LAN and optical fiber network facilities and have full Wi-Fi coverage in all enclosed spaces;

- **heating and air-conditioning systems:** all rooms must be air-conditioned and heated. The building project must correspond to the current legislation on the limitation of building energy needs. Heat pump systems should preferably be used. In particular, the developed system solution must favour the adoption of technologies that guarantee, with equal environmental conditions in indoor spaces, the highest possible energy saving. The validity of the project solution must be demonstrated through calculation methods provided for by the current legislation. Given the intended use of the rooms, with particular reference to the rehearsal rooms, the system must guarantee limited noise levels, also inside, and in any case in compliance with the regulatory limits. The system must be divided into homogeneous zones, adopting the same criteria as for the electrical system, and must be equipped with installations for the automatic regulation of the internal thermo-hygrometric conditions. Particular attention must be paid to the choice of positions and types of components in order to limit malfunctions caused by unauthorised operation by users. The design solution must guarantee the possibility of carrying out maintenance work on all the components in safety conditions for the operators and the functional subdivision of the circuits must be such as to limit inefficiencies following faults or malfunctioning of the system.

Remote management and remote reading systems for thermo-hygrometric parameters (temperature, relative humidity, CO2 level) must be provided;

- **ventilation and aeration systems of areas:** this type of system must be designed adopting the same criteria used for heating and air-conditioning systems;
- **air handling units:** AHUs must allow for the correct treatment of primary air before sending it into the room to be air-conditioned. The air will be controlled both from the thermo-hygrometric point of view (temperature and relative humidity) and from the point of view of purity by means of suitable filtration, preferably using rigid pocket systems for dust filtration with efficiencies in accordance with standard EN779:2012: F9;
- **lifting installations for people and materials:** the building shall be equipped with installations for overcoming architectural barriers. In any case, the absence of architectural barriers of any kind should be a priority at the design phase and should therefore be limited to cases where it is physically impossible not to create them. It will be necessary to install lifts to serve workers and visitors, as well as goods lifts. Lifts must be located in common spaces. The number of installations must be such as to ensure continuity of work even in the event of a breakdown. Lifts required to move bulky objects from one level to another must be of a size that allows to use trolleys (4x3x h. 3 m). In addition, as already mentioned in subparagraph

- 4.1.3, certain departments will have to be equipped with overhead cranes;
- **fire protection systems:** the building must have fire protection systems in accordance with current legislation. Fire detection systems will interface with special equipment supplied subsequently by the Administration and preferably compatible with systems already installed and in use at the Teatro alla Scala;
 - **purification plant:** the building shall be equipped with a drop-in physical-chemical purifier with no. 4 tanks of approx. 40 m³. In order to ensure full inspectability and control of possible leakage, sump tanks should be constructed within underground concrete areas so that their outer surface can be inspected. The collected water will then be sent through booster pumps to the collection tank at the treatment plant and, once purified, will be discharged into the sewerage system. The purification plant will serve the treatment of water from the following departments: costume design room, laundry room, set design (in no. 2 paint rooms) and stage plastics;
 - **dust extraction system:** in the departments where wooden, iron or aluminium sets are created, costumes are made, painting is carried out and, more generally, the activities necessary for the preparation of shows are all carried out, a series of machines are required, which are indispensable for guaranteeing the various processes and the safety of the operators in the workplace. The different emission points of aspiration, with flow rates and possible abatement systems, and the prescriptions regarding the various identifiable steps in the production cycle are summarised below in order to provide an idea of what is currently present at the Laboratori Scala Ansaldo;

LIST OF DEPARTMENTS WITH THEIR ENVIRONMENTAL PROTECTION SYSTEMS CURRENTLY IN USE

Department	Work phase	Pollutants	Environmental protection system	Emission point	Flow rate [m ³ /h]
Set design	Preparation of water-based paints (no. 2 paint room)	Powders	Suctions in the no. 2 paint rooms dedicated to the preparation of water-based paints	E1 E2	2,000 2,100
Upholstery	Making of curtains and tablecloths with the aid of sewing machines, drills, staple guns, etc.	-	-	-	-
Sculpture	Processing of plastic materials (hot cutting of polystyrene)	Powders, VOCs, Ammonia, Acetone, Isocyanates	Localised suction for hot cutting of polystyrene blocks	E3	14,000
Stage plastics	Production of items in polyester and other polymers or stage materials	Powders, VOCs, Ammonia, Acetone, Isocyanates	Suction cabin for the production of items in polyester and other polymers or stage materials	E4	21,000
	Thermoforming of plastic sheets	VOCs	Localised suction for plastic moulding processes	E5	4,000
Mechanical workshop	Metal processing (cutting, welding, bending)	Powders, particle material	Workstations with localised suction for welding operations	E6 – E7	2,800
	Special plasma welding	Powders	Suction wall for plasma cutting machine	E14	4,500

Construction - Carpentry	Production of wooden scenic coverings approx. 25 machine tools	Dusts	Suction localised on work machines with dust collection in the external silo	E8	7,500
Construction - Carpentry (engine room)	Production of wooden scenic coverings approx. 10 machine tools	Dusts	Suction localised on work machines with dust collection in the external silo	E8	
Wardrobe	Cutting, sewing and ironing of fabrics	-	Suction on ironing tables and fabric dryer	-	-
Costum design room	Paint spraying applications	Powders, COV	Suction cabin for the application of airborne products Suction hoods on tanks for dyeing certain fabrics Suction on fabric dryer	E9	10,000
Laundry room	Fabric washing	COV	Suction cabin for fabric spotting operations	E10	
Equipment design	Paint spraying applications	Powders, COV	Suction cabin for various applications	E11	8,200
Costume storage	Storage of theatre costumes	-	-	-	-

- **compressed air system:** laboratories must be equipped with a compressed air system capable of serving the following departments:
 - set design;
 - sculpture;
 - stage plastics;
 - mechanical workshop;
 - carpentry;
 - equipment design;
 - wardrobe.

The system must guarantee the activity and simultaneous operation of the various departments, with constant use of machine tools and silos as well as occasional uses. The sockets, about no. 400, should be distributed evenly and on columns;

- **anti-intrusion systems:** the building should be equipped with an anti-intrusion system in various spaces, entrances and critical points, including the installation of sensors. The system must be designed to provide security for materials and works (costumes, sets, etc.) displayed and stored in the building. The latter must also be equipped with a video surveillance system at various spaces, entrances and critical points by installing cameras.

It must be taken into account that the new complex will be equipped with an **electrical transformer cabin** with a power of 5,000 kW in Area 1. The dimensions of this cabin, of approx. 30 m², will be determined more precisely by the public network operator when the project is defined.

4.2 EXPANSION OF PARCO DELLA LAMBRETТА

4.2.1 GENERAL OBJECTIVES

The landscape design for the expansion of Parco della Lambretta should make this public space a lively and popular place, as well as a reference point for the district and more generally for the city, given the rapidly changing context in which it is located. The intervention should also contribute to the management of phenomena related to river flooding. Competitors should take into account the presence of:

- **River Lambro and small lake under the viaduct**, making the water a characteristic element of the existing park, to be enhanced in the expansion;
- **free spaces under the viaduct**, which will have to be enhanced as they provide an important connection between the residential area to the west and the expansion of the park to the east;
- **private agricultural areas to the north**, with which to create ecological connections and landscape relationships, as suggested in the ReLambro project;
- **the so-called “Palazzo di Cristallo”** as a testimony of industrial archaeology to be preserved and recovered, even partially, which will have to be highly unpaved and made an integral element of the park able to guarantee the continuity of its vegetation. It should be noted that the facades of the so-called “Palazzo di Cristallo” have been declared to be of cultural interest, as explained in more detail in subparagraph 4.4.3.

Particular attention should be paid to the issue of environmental sustainability, in particular to the geological, hydrogeological and hydraulic characteristics of the area, as reported in subparagraph 4.4.1, which should be combined with the maximisation of permeable green areas and the protection of biodiversity, optimising construction, management and maintenance costs. Equally fundamental will be both the continuity with the design of the existing park and the other existing and planned green areas, and the relationship with the new functions planned in the GFU Rubattino, in particular with the new site of the Teatro alla Scala laboratories and warehouses.

As a general rule, competitors are invited to consult the annex “5.4 Estratto Prescrizioni progettuali propedeutiche alla redazione di progetti e alla successiva manutenzione delle aree verdi pubbliche”.

4.2.2 WATER MANAGEMENT AND WATER RISK MITIGATION

Concerning the water protection of the territory, competitors are invited to consult the annex “5.2 Linee guida per la progettazione dei sistemi urbani di drenaggio sostenibile nel territorio comunale”.

Competitors are required to **maximise green areas, preserve free soil for planting vegetation, minimise sealing and propose measures for removing paving** to restore the ‘sponge function’ of permeable soils. In addition to

depaving, other measures are required, such as **flooding parts of the park**, which can recover and accumulate stormwater, reducing the need for drainage. The design of the park could be characterised by the presence of earth movements capable of varying the landscape and the perception of spaces and at the same time contributing to mitigating the water risk, temporarily filling not only stormwater but also water from possible flooding of the River Lambro, with a view to making the city hydraulically resilient to intense weather events and possible flooding. The aim is to promote natural infiltration into the water table, reduce flood peaks in receiving bodies and at the same time increase biodiversity. Various design solutions are possible¹⁵ by combining various elements such as depressed areas, ditches or filter trenches: the change in the morphology of the ground can allow the collection and the temporary storage of stormwater and its possible reuse. **Stormwater from operations outside the park must be managed and resolved directly in the respective areas.**

The safety of people must be guaranteed at all times, also taking into account the possibility of more intense events, specifying possible different degrees of use of the park in relation to time scenarios connected to hydraulic events, in particular as regards equipped spaces as well as perimeter and crossing cycle-pedestrian paths.

In the event that the intention is to propose the construction of ponds and artificial lakes, it is recommended to consult the annex “5.3 Linee guida relative alla valutazione delle fonti attrattive di fauna selvatica in zone limitrofe agli aeroporti” of the Italian Civil Aviation Authority (ENAC), as reported in Art. 41 of the Implementation Rules of the PGT Regulatory Plan.

Also the paving of cycle and pedestrian paths should be permeable, in order to increase stormwater infiltration and minimise surface runoff. Any infiltration systems may be placed under the paths, provided that this does not pose a danger of soil settlement as a result of leaching due to infiltration. If underground infiltration systems are used, the passage of maintenance vehicles must be taken into account. The choice of materials should be directed towards ecological solutions and innovative technologies using recyclable or recycled materials should be preferred.

4.2.3 BIODIVERSITY AND VEGETATION

Green areas must be able to develop an **ecologically efficient plant, herbaceous, tree and shrub system**, in compliance with any phytosanitary restrictions, which contributes to **improving microclimatic conditions in the area, mitigating summer temperatures and reducing atmospheric pollution**. A further added value of the park could be the presence of vegetation with low water requirements.

Species should be chosen on the basis of a careful assessment of their

¹⁵ The following publication is recommended: Gibelli G., Gelmini A., Pagnoni E., Natalucci F. (2015), *Gestione sostenibile delle acque urbane. Manuale di drenaggio 'urbano'. Perché, Cosa, Come*, Regione Lombardia, Ersaf, Milano

characteristics, in particular their capacity to absorb CO₂ and the intensity of emissions of Biogenic Volatile Organic Compounds (BVOC) which, under particular atmospheric and climatic conditions, contribute to the formation of secondary pollutants such as ozone (O₃) and an important part of atmospheric particulate matter (PM₁₀), with high risks for human health.

In addition, preference should be given to native or naturalised plants which are adapted to local environmental conditions, and flowering and/or berry trees which contribute to the protection of biodiversity, harmonious integration into the landscape and reduction in maintenance and management costs.

Specifically, the preferred characteristics for trees are the following:

- structural stability;
- low maintenance costs;
- reduced conflicts with above- and underground infrastructure and pavings;
- hardiness and resistance to biotic and abiotic stress factors;
- adaptability to climate change.

Taking into account both the hydraulic risk and the planned soil reclamation and heaps removal, competitors are asked to verify the presence of valuable plants and to assess whether some of them could be maintained and recovered. With regard to the parking area to be depaved, it is requested, in relation to the current status, to safeguard the existing trees, keeping them in situ or providing for their relocation in the park. If it is not possible to plant new trees, competitors are invited to consider the possibility of depaving and to make design choices that will increase green areas and permeability, as well as microclimate regulation and urban comfort.

Due to the proximity of the airport, also for the choice on vegetation, it is recommended to consult the ENAC annex “5.3 Linee guida relative alla valutazione delle fonti attrattive di fauna selvatica in zone limitrofe agli aeroporti”.

4.2.4 THE SOCIAL VALUE

In addition to fulfilling a fundamental ecological function, the new park should be designed, in compliance with the regulations concerning hydraulic risk, as a **place for leisure time** where it will be possible to play and practice open air sports and as a **place of aggregation and socialisation** welcoming both the inhabitants of the district and occasional users, offering spaces suitable for different cultures, ages and interests. It should address a wide range of users and allow for different activities in addition to the existing ones. It should be **perceived as a safe place, with barrier-free paths, easily accessible and walkable on foot or by micro-mobility means**.

The proximity to the new site of the Teatro alla Scala laboratories and warehouses can be conceived as an attractive and qualifying element of the new park, also for the possibility to hold **various kinds of events**, such as concerts and shows, according to the site regulations, able to increase the use of the park and, consequently, increase the sense of belonging by the district inhabitants. It

should be noted that the number of these events will be limited, also in size, in relation to the real surface of the available green areas and the need to provide flooding areas to mitigate the water risk.

A further aspect to which competitors are asked to pay particular attention is that of **urban furniture** which, if well designed, can contribute to improving the quality of the park, making it more pleasant for people to stay. High-quality and durable solutions are required, as well as a careful study of the location of the different elements (tables, benches, bicycle racks, fountains, children's games, sports fields, etc.), in order to adequately equip the park, facilitate care and encourage socialising.

As far as the choice of materials is concerned, competitors are invited to refer to the Minimum Environmental Criteria (CAM) and the principles of eco-design, opting for products that can be easily dismantled at the end of their useful life, so that the various components can be recovered, reused or recycled. The Urban Furnishing Manual¹⁶ of the Municipality of Milan, as a tool used to standardise furnishings and contain maintenance management costs, and the annex "5.5 Estratto Spazio Pubblico - Linee guida di progettazione" may be useful.

4.2.5 THE RECOVERY OF THE SO-CALLED "PALAZZO DI CRISTALLO"

Competitors are asked to preserve and recover, even partially, the existing structure as testimony of industrial archaeology. The so-called "Palazzo di Cristallo" will have to be highly unpaved and made an integral element of Parco della Lambretta, which is to be expanded, in order to guarantee the continuity of its vegetation, in compliance with the Ministry of Culture Decree no. 5329 of 20/09/2021, that is the subject of subparagraph 4.4.3.

In order to preserve the existing structure, competitors are invited to consider sandblasting of metal surfaces, restoration and integration of the carpentry, anti-corrosive treatments and final painting. The insertion of micropiles to consolidate the foundation plinths and a possible structural adjustment according to the recovery proposal (also in relation to a possible lowering of the ground level of the surrounding area to make the park floodable) should also be considered.

4.2.6 INTEGRATION OF THE VARIOUS COMPONENTS AND INTEGRATED DESIGN WITH THE SOIL CONDITIONS

The project proposal should consider in a holistic, integrated and co-ordinated way all the various components (geological, hydrogeological and hydraulic components of the Competition area, soil contamination and what remains of the so-called "Palazzo di Cristallo").

¹⁶ The document can be downloaded at the link: [http://img.trk.comune.milano.it/static/105044/assets/2/MANUALE%20ARREDO%20URBANO_SCHEDE%20\(1\).pdf](http://img.trk.comune.milano.it/static/105044/assets/2/MANUALE%20ARREDO%20URBANO_SCHEDE%20(1).pdf)

4.3 ENVIRONMENTAL SUSTAINABILITY

In accordance with the Air and Climate Plan (PAC) and the Sustainable Energy Action Plan (PAES), which the Administration has undertaken to prepare as part of the Covenant of Mayor initiative of the European Commission, and with commitment of the Municipality within the C40 Cities network in the fight against climate change, competitors are asked to adopt a design approach oriented towards the environmental sustainability.

Specifically, the provisions of the PGT must be taken into account, wherein Art. 10 of the Implementation Rules of the Regulatory Plan promotes and encourages *“environmental sustainability and urban resilience through the introduction of new standards. With reference to the objectives defined in the Plan Document, all interventions will have to act in terms of reducing and minimising carbon emissions, improving urban drainage and microclimate, creating green infrastructures with the aim of reducing the input of stormwater into the sewage system, mitigating heat islands and raising housing standards by increasing the presence of urban green areas”*. The Plan regulates the implementation methods of the rule, which also applies to *“the construction of new buildings for services of public initiative, either directly or transferred to the Administration through the payment of urbanisation charges, as well as the construction of new buildings for services and equipment, whether public or private for public use or general interest”*. In view of the strategic nature of the project, it is considered necessary to encourage zero emissions of CO₂, in accordance with the technical criteria laid down in Art. 10¹⁷. This objective can be achieved through the introduction of the following design elements. For each element, some measures are provided to be adopted in alternative or combined form¹⁸.

MEASURES TO MINIMISE EMISSIONS

Design element	Measure to be used to minimise CO ₂
High-performance energy solutions	Adoption of design solutions to minimise CO ₂ emissions related to the energy uses of the building (related to winter and summer air conditioning, domestic hot water preparation, ventilation and, for the tertiary sector, lighting and people transport)
Renaturalisation interventions, including building-integrated green spaces	Provision of green surfaces and roofs
Technologies for reduced water consumption and stormwater recycling	Stormwater recovery
	Provision of water-saving devices

¹⁷ For further details, see the link: <https://www.pgt.comune.milano.it/prnorme-di-attuazione/norme-di-attuazione/titolo-i-disposizioni-general/capo-ii-disciplina-generale/art-10-sostenibilita-ambientale-e-resilienza-urbana>

¹⁸ See the “Technical document for the implementation of the discipline of Art. 10 “Environmental Sustainability and Urban Resilience” of the Implementation Rules of the PGT Regulatory Plan, containing the calculation method for the minimisation of carbon emissions and the achievement of the Climate Impact Reduction (RIC) index”. The Document is available at the link; https://www.comune.milano.it/documents/20126/69896953/Documento+tecnico+Art+10+-+DD+797+del+5_02_2020.pdf/806064dd-a45d-a806-081f-18a181bf6174?t=1580915737127

Use of sustainable and/or recycled content materials	Use of construction materials with recovered or recycled content
Adoption of surface finishes with a high solar reflectance coefficient	Construction of external surfaces that reduce the “heat island” effect
	Construction of roofs that reduce the “heat island” effect
Solutions for sustainable mobility	Provision of suitable bicycle parking areas and installation of charging points for electric vehicles

Moreover, again with reference to Art. 10, *“the implementation of interventions shall provide solutions aimed at improving environmental quality and adaptability through the respect of a “Climate Impact Reduction” index, intended as the ratio between green surfaces”* (permeable ground surfaces, green semi-permeable ground surfaces, paved semi-permeable ground surfaces, green roofs, green roofs of underground buildings, green walls) *“and the territorial surface of the intervention [...] For new buildings it is mandatory to reach a “Climate Impact Reduction” index higher than 0.2”*.

Competitors must propose solutions that are able to guarantee the maximisation of permeable green areas and compliance with the provisions of Art. 10 in the development of further project levels.

It should be noted that **during completion phase for the PFTE, compliance with the requirements of Art. 10 must be proven**. With reference to the “calculation for the minimisation of climate-altering emissions” and to the “calculation for the achievement of the Climate Impact Reduction index”, competitors should consult Annexes A and B of the Technical document for the implementation of the guidelines set out in Art. 10 “Environmental sustainability and urban resilience” in the Implementation Rules of the PGT Regulatory Plan¹⁹.

In compliance with the provisions of the PGT, the Minimum Environmental Criteria (CAM) relating to the reduction of soil consumption and the maintenance of permeability pursuant to the Ministerial Decree of 11 October 2017 must in any case be met.

Specifically with regard to the new site for the Teatro alla Scala laboratories and warehouses, competitors are asked to research and choose design solutions that have the lowest possible environmental impact throughout the life cycle of buildings, with particular reference to the design, construction, management and maintenance phases. In addition, the laboratories and warehouses must be designed as **NZEB - Nearly Zero Energy Buildings**: a wide use of energy produced from renewable sources must be foreseen, as well as a high-performance enclosure and typological solutions that take advantage from external factors such as exposure, ventilation, etc. In this perspective, the complex should be an innovative example of an integrated use of available technologies, in application of national and European standards on safety and energy efficiency of buildings.

¹⁹ Annexes A and B can be downloaded at the following link: <https://www.comune.milano.it/aree-tematiche/urbanistica-ed-edilizia/pgt-approvato-e-vigente-milano-2030/sostenibilita-ambientale-e-resilienza-urbana>

According to the principles of **bioclimatic architecture**, typological solutions and the performance of technological systems must respect the environmental and climatic characteristics of the site, achieving conditions of well-being inside the building. The **indoor environmental quality**, intended as the combination of lighting, acoustics, air temperature, air humidity and electromagnetic pollution, is one of the aspects to which particular attention should be paid, especially with regard to the choice of materials and finishes, heating and air conditioning systems, ventilation and lighting. The potential of **domotics** for the creation of 'smart' buildings and the coordinated, integrated and computerised management of technological systems (heating and air conditioning, water, gas and light distribution, video surveillance systems, etc.) and of information and communication networks should be taken into account, with the aim of making management flexible, as well as improving comfort, safety, energy saving and work quality inside the building. Competitors are also required to equip the building with stormwater collection and reuse systems, also in order to mitigate the effects of climate change and hydraulic risk.

The overall project proposal should be oriented towards the adoption of **Nature Based Solutions (NBS)**, i.e. solutions that are inspired and supported by nature, adapted to the local context, that can improve stormwater management, reduce both air and noise pollution and mitigate the effects of high temperatures, providing environmental, social and economic benefits and contributing to making the city more resilient to climate change.

4.4 CONSTRAINTS AND CLARIFICATIONS

4.4.1 GEOLOGICAL, HYDROGEOLOGICAL AND HYDRAULIC COMPONENT

The Competition area is located along the left bank of the River Lambro. The ring road viaduct represents an important visual demarcation line, without performing any function of containing flood waters. Before the urban development of Milan, the area was part of the floodplain of the river, as competitors can easily see from historical maps, and is still subject to frequent flooding during flood events of the watercourse.

• characteristics of the Competition area

During the drafting the PGT, the geological, hydrogeological and hydraulic component provided a detailed characterisation of the municipal territory, aimed in particular at taking into account (at the level of knowledge of phenomena and critical conditions) the dynamics of the main watercourses and the water table in the urban planning. In the PGT, the hydrological and hydrodynamic aspects of the River Lambro, with particular reference to flooding conditions, were analysed in detail, with the aim of identifying the water hazard conditions on the basis of which to define the constraints to be taken into account for urban intervention. For the hydraulic sector, the analyses carried out are also the update

of the superordinate planning tools at regional and river basin level, represented by the Hydrogeological Structure Plan of the Po River Basin (PAI, 2001) and the Flood Risk Management Plan (PGRA, 2015), both prepared by the Po River District Basin Authority in collaboration with the Lombardy Region. Both the results of the analyses carried out for the adaptation of the PGT to the basin planning, and all the elements deriving from the transposition of the contents of the PAI and the PGRA to a municipal scale are shown in the PGT board “G.15 Carta PAI-PGRA”, drawn up to the urban planning instrument scale and using the same topographical base.

The characterisation of the water hazard conditions related to the flood conditions of the River Lambro, on the whole stretch of the watercourse within the municipal boundary of Milan, has been developed with the use of a simulated 2D hydraulic model in varied movement of considerable detail, supported by a 5.00x5.00 calculation grid which, for the hydrological scenarios considered (for the return times of 10, 200 and 500 years), precisely returns the maximum water heights (in metre above sea level), the maximum water depths (in metre) and the maximum flow velocities (in modulus and direction) (fig. 34).

Where relevant, the model allows direct observation of the flood dynamics in terms of the evolution over time, as the flood wave passes through the riverbed, of water levels and velocities.

fig. 34
Water hazard of the Competition area for return times of 10 and 200 years, on the left and right respectively - Elaboration with the 2D numerical simulation model of the PGT.



Legend
■ h1 = 0,05 - 0,30 m (low)
■ h2 = 0,30 - 0,70 m (medium)
■ h3 > 0,70 m (high)

Depending on the degree of water hazard, the characteristics of the water table and the geological-geotechnical aspects, feasibility classes have been identified that zonify the entire municipal territory (board “R01 Fattibilità geologica e idraulica”) and implementation rules have been written (Arts. 44 and 45 of the Implementation Rules of the PGT Regulatory Plan) which dictate the limitations on land use solutions. The Competition area is identified in the PAI map as band C and in the PGRA it is included among the “*areas potentially affected by frequent flooding*”. As a result of the detailed evaluation carried out for the adaptation of the PGT to the basin planning, the entire Competition area has been classified by the PGT as **feasibility class IIIa + IIIc** (“*Feasibility with significant limitations*” as set out in Art. 45, subsection 3 and Art. 45, subsection 5 of the Implementation Rules of the PGT Regulatory Plan): **areas of medium flood hazard and low depth of the water table (< 5 m)** (fig. 35).

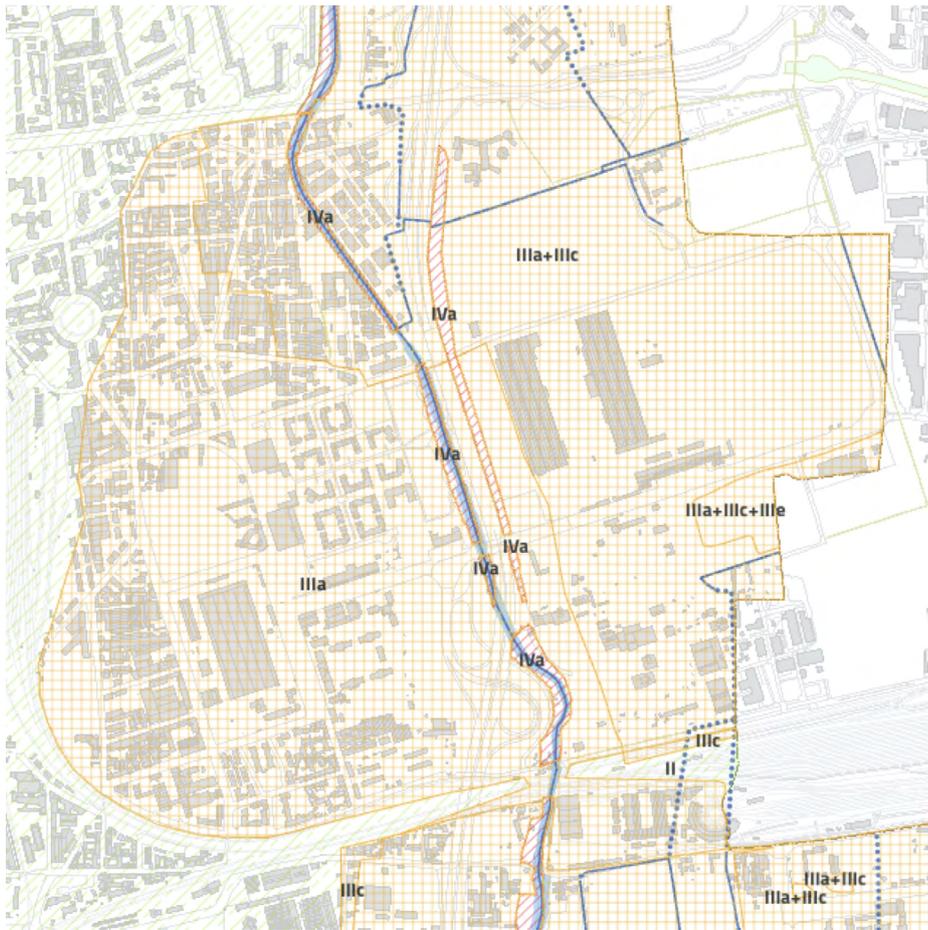
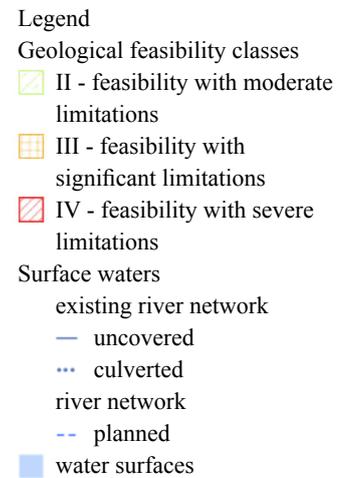


fig. 35
 Delimitation of the feasibility classes of the PGT for the Competition area.
 Source: PGT “Milano 2030”



In order to ensure the feasibility of the project, the water hazard conditions, defined by the detailed hydraulic analyses related to the study of the geological-hydrogeological and seismic component of the PGT, must be verified and assessed in the PFTE. **The verification of hydraulic compatibility of the project interventions, as prescribed by Art. 45, subsection 3, letter b), must be submitted during the PFTE completion phase.** The verification of hydraulic compatibility must certify that the hydraulic hazard conditions in the project configuration (with reference to the 200-year return time) entail compatible risk values both locally and in the surroundings, possibly affected by the intervention itself.

The Competition area is at a height of approx. 114.0 m above sea level on Via Rubattino and of approx. 115.0 m above sea level on Via Caduti di Marcinelle; the current hydraulic hazard condition, based on the results of the 2D model simulations, is represented by:

- **for the 200-year return time:** maximum water heights above ground level of 1.5÷1.7 m mainly on the perimeter and 0.4÷0.6 on the internal surfaces; in absolute height the maximum water level is therefore 115.5÷116.0 m above sea level in the whole area; the maximum flow velocities are moderate, 0.2÷0.7 m/s;
- **for the 10-year return time:** maximum water heights are lower, with the highest values predominantly on the perimeter, between 0.4 and 0.7 m;

in absolute height the maximum water level reaches an average height of approx. 114.4 m above sea level in the area.

During the design phase, competitors must take into account the limitations related to feasibility class IIIc concerning the low depth of the water table (< 5 m), as defined by Art. 45, subsection 5 of the aforementioned rules, where the phenomenon with regard to the issues related to basement and semi-basement spaces, water discharges, as well as the compatibility with hydraulic invariance criteria must be considered.

• **design indications concerning hydraulic aspects**

The level of water hazard which characterises the Competition area significantly conditions the design solutions that are to be identified. In this respect, competitors should take into account:

- the consistent maximum water heights that will be established with the design flood (200-year return time), in relation to which design solutions must be identified to reduce the hydraulic risk of the design configuration to compatible residual values;
- the high frequency of flooding, demonstrated by the still-significant maximum water levels occurring for the 10-year return time.

The project must identify and define the measures required to ensure protective functions of the exposed elements in order to reduce the residual risk to compatible levels. From this point of view, these are protections against the maximum flood level that can be obtained by integrating different solutions (raising the access level of buildings, local structures to contain water levels, etc.). The hydraulic protection measures defined in the project and the related hydraulic checks must comply with the provisions of Art. 45, subsection 3, letter b) of the Implementation Rules of the PGT Regulatory Plan which regulates “*new building interventions and building interventions on existing buildings that directly interfere with hazardous conditions*”. The ease of maintenance of the proposed intervention solutions as well as the related running costs should also be taken into account. In any case, the project must define solutions that do not worsen the existing water risk situation.

4.4.2 CHARACTERISTICS OF THE NEW SITE OF THE TEATRO ALLA SCALA LABORATORIES AND WAREHOUSES

The new complex may have several floors above ground. Due to the proximity to Milan-Linate airport, it should be noted that the limit imposed on the heights of buildings, which is 147.85 m above sea level, must be respected²⁰, as shown in the board “R.08_Ostacoli e pericoli per la navigazione aerea”, attached to the PGT Regulatory Plan. The complex can be divided into several volumes/pavilions with the precaution of ensuring covered, indoor passages between the

²⁰ It should be noted that the Competition area is at an altitude of approx. 114.0 m above sea level on Via Rubattino and 115.0 m above sea level on Via Caduti di Marcinelle.

various buildings. Finally, considering the low depth of the water table, it is not permitted to build basements where people would spend time.

4.4.3 THE SO-CALLED “PALAZZO DI CRISTALLO” AND THE WATER TOWER

With regard to the so-called “Palazzo di Cristallo”, located in sub-area 2B, the two facades have been declared of cultural interest, as set out in Art. 10, subsection 1 and Art. 12 of Legislative Decree 42/2004 (*Cultural Heritage and Landscape Code*), by Ministry of Culture Decree of 20/09/2021, available in the attached folder “5.1 Decreto del Ministero della Cultura del 20/09/2021”.

An extract from the aforementioned Decree follows:

“[...] From an architectural point of view, the so-called “Palazzo di Cristallo” is strongly characterised by its original brick facades [still intact on the south side] and cyclopean window frames, which are also considered significant evidence of the glorious industrial past of the city and, in any case, should be preserved together with the two spans behind the building”.

With regard to the Water Tower, located in sub-area 1A, competitors are invited to assess its preservation and enhancement, in compliance with the functional requirements of the new site for the Teatro alla Scala laboratories and warehouses.

chapter 5

FINANCIAL LIMITS AND ESTIMATION OF INTERVENTION COSTS

The total maximum cost for the interventions to be completed with regard to Areas 1 and 2 is set at € **120,000,000.00 (VAT included)**. Costs for soil reclamation and hydraulic works for hydraulic risk mitigation are excluded. The maximum total cost, divided into the two areas, is provided below.

5.1 COST RELATED TO AREA 1 - NEW SITE OF THE TEATRO ALLA SCALA LABORATORIES AND WAREHOUSES

The maximum cost of intervention to be carried out (economic situation, including cost of works, costs of design, supervision of works, inspections, safety costs, Competition costs and amounts at the disposal of the Contracting Authority), is set at € **98,000,000.00** inclusive of VAT.

The share of the amount for works is set at € **66,333,150.00** (excluding VAT), including external safety costs amounting to € **1,300,650.00** (excluding VAT).

Within the aforementioned amounts, the categories that make up the intervention are listed in the following table, that contains the composition of the intervention and the correspondences with:

- classification pursuant to Presidential Decree 207/2010;
- classification pursuant to Law 149/1949 as amended;
- classification pursuant to Ministry of Justice Decree of 17/06/2016.

AREA 1

New site of the Teatro alla Scala laboratories and warehouses

Cost of works	Classification Presidential Decree 207/2010	Classification Law 149/1949	Classification Ministry of Justice Decree of 17/06/2016
€ 687,500.00	OG 1	I/a	E.01
€ 10,668,000.00	OG 1	I/b	E.02
€ 7,675,500.00	OG 1	I/b	E.13
€ 5,241,000.00	OG 1	IX/b	S.04
€ 2,620,500.00	OS 3	III/a	IA.01
€ 17,322,000.00	OS 28	III/b	IA.02
€ 40,000.00	OG 1	III/b	IA.02
€ 17,322,000.00	OS 30	III/c	IA.04
€ 2,160,000.00	OG 3	VI/a	V.02
€ 1,296,000.00	OG 1	VI/a	V.02
€ 65,032,500.00	TOTAL AMOUNT FOR WORKS AREA 1 (excluding VAT)		

5.2 COST RELATED TO AREA 2 - EXPANSION OF PARCO DELLA LAMBRETТА

The maximum cost of intervention to be carried out (economic situation, including cost of works, costs of design, supervision of works, inspections, safety costs, Competition costs and amounts at the disposal of the Contracting Authority, with the exception of costs relating to analysis, design and execution of anything needed to reclaim soil), is set at € 22,000,000.00 inclusive of VAT. The share of the amount for works is set at € 12,344,800.00 (excluding VAT), including external safety costs amounting to € 474,800.00 (excluding VAT).

Within the aforementioned amounts, the categories that make up the intervention are listed in the following table, that contains the composition of the intervention and the correspondences with:

- classification pursuant to Presidential Decree 207/2010;
- classification pursuant to Law 149/1949 as amended;
- classification pursuant to Ministry of Justice Decree of 17/06/2016.

AREA 2

Expansion of Parco della Lambretta

Cost of works	Classification Presidential Decree 207/2010	Classification Law 149/1949	Classification Ministry of Justice Decree of 17/06/2016
€ 1,850,696.06	OG 2	I/c	E.20
€ 1,520,000.00	OS 21	IX/b	S.04
€ 640,000.00	OS 18-A	IX/b	S.04
€ 3,881,312.77	OS 24	I/a	E.17
€ 1,310,303.58	OS 24	I/c	E.18
€ 344,452.80	OS 24	VIII	D.04
€ 887,340.85	OS 24	III/c	IA.03
€ 90,000.00	OS 24	VII/b	D.03
€ 70,000.00	OG 11	VII/b	D.03
€ 325,530.00	OG 13	-	P.01
€ 651,060.00	OG 1	I/a	E.01
€ 299,303.94	OG 2	I/e	E.22
€ 11,870,000.00	TOTAL AMOUNT FOR WORKS AREA 2 (excluding VAT)		

It should be noted that, with reference to the expansion of Parco della Lambretta and for the purpose of its inclusion in the Three-Year Plan of Public Works (PTOP) of the Municipality of Milan, the PFTE can only be approved following the results and approval of preliminary investigations, characterisation plan and reclamation project at technical-economic feasibility or definitive level.

The winning project must be fully adjusted and coordinated with the reclamation works, as well as with the opinion of the institutions including the opinion of the competent offices of the Ministry of Culture concerning the so-called "Palazzo di Cristallo".

With reference to the expansion of Parco della Lambretta, the completion of the PFTE will be borne by the winner without further financial compensation, while the financing of the other studies/projects/works mentioned will have to be financed by the Municipality of Milan with additional resources.

The assignment of the Definitive and Executive Design can only take place after the aforementioned phases and must be coordinated and integrated with the remaining designs (relating to the soil reclamation and the geological, hydrogeological and hydraulic component).

Realisation of the expansion of Parco della Lambretta will be subject to the effective compliance of the soils with Table 1, column A - Annex 5 to Part IV of the Legislative Decree 152/2006 as amended.

Finally, costs of any demolition work on the so-called “Palazzo di Cristallo” will be quantified according to the project and must in any case be contained within the aforementioned financial limits.

REGULATORY FRAMEWORK

The following is a list of the main technical and procedural laws to use as a reference for the design of the works, as stated in the Competition. The list is given as an indication. It is the competitors' responsibility to comply with the Italian legislation applicable to the project, also in relation to the nature and specificity of the design choices.

Rules on building procedures

Ministerial Decree of 17/06/2016 – Approval of fee tables commensurate to the quality level of designs adopted pursuant to article 24, subsection 8 of the Legislative Decree no. 50 of 2016;

Legislative Decree no. 50 of 18/04/2016 as amended – Implementation of Directives 2014/23/EU, 2014/24/EU and 2014/25/EU on the assignment of concession contracts, public procurements and the procurement procedures for entities operating in the water, energy, transport and postal services sectors, as well as for the reorganisation of the existing rules on public contracts for works, services and supplies;

Presidential Decree no. 207 of 05/10/2010 as amended – Regulations for the execution and implementation of Legislative Decree no.163 of 12 April 2006, on the “Code of public contracts for works, services and supplies in implementation of Directives 2004/17/EC and 2004/18/EC”;

Presidential Decree no. 380 of 06/06/2001 as amended – Consolidated Act of legislative and regulatory provision on building matters;

Law no. 1150 of 17/08/1942 as amended – Urban Planning Law.

Local regulations

Territorial Development Plan (PGT “Milano 2030”) of the Municipality of Milan;

Building Regulation of the Municipality of Milan;

Health and Safety Regulation of the Municipality of Milan;

Regulation for the Use and Protection of Public and Private Green Areas of the Municipality of Milan.

Rules on hydraulic and hydrological invariance

Lombardy Regional Regulation no. 7 of 27/11/2017 as amended – Regulation containing criteria and methods for observing the principle of hydraulic and hydrological invariance, pursuant to article 58 bis of the regional law 11 March 2005, no. 12, Territorial Government Law.

Rules on structures

- Lombardy Regional Circular no. 1 of 28/01/2020 – Applied rules regarding works or constructions and relative supervision in seismic areas, as set out in Regional Law no. 33/2015, following the entry into force of Law no. 156/2019, of Regional Law no. 21/2019 and of Regional Government Resolution no. XI/2584/2019;
- Ministerial Decree no. 58 of 28/02/2017 – Seismic Bonus - Guidelines for the classification of the seismic risk of buildings and the modalities for the certification of the effectiveness of the interventions carried out by qualified professionals. Amendments to Ministerial Decree no. 58 of 28/02/2017;
- Ministerial Circular no. 7 of 21/01/2019 – Instructions for the application of the “Update of the «Technical Standards for Construction»” referred to in the Ministerial Decree of 17 January 2018;
- Ministerial Decree of 17/01/2018 – Update of “Technical Standards for Construction”;
- Ministerial Decree no. 58 of 28/02/2017 – Seismic Bonus - Guidelines for the classification of the seismic risk of buildings and the modalities for the certification of the effectiveness of the interventions carried out by qualified professionals;
- Lombardy Regional Government Resolution no. X/5001 of 30/03/2016 – Approval of the guidelines and coordination for the exercise of the functions transferred to the municipalities on seismic issues (article 3, subsection 1 and article 13, subsection 1 of Regional Law no. 33/2015);
- Lombardy Regional Law no. 33 of 26/06/2015 as amended – Provisions on works or constructions and relative supervision in seismic areas;
- Lombardy Regional Government Resolution no. X/2129 of 11/07/2014 – Update of seismic zones in the Lombardy Region (Regional Law 1/2000, article 3, subsection 108, letter d);
- Lombardy Regional Government Resolution no. IX/2616 of 30/11/2011 – Update of the “Criteria and guidelines for the definition of the geological, hydrogeological and seismic component of the Territorial Development Plan, in implementation of article 57, subsection 1 of Regional Law no. 12 of 11 March 2005, approved by Regional Government Resolution no. 8/1566 of 22 December 2005, subsequently amended by Regional Government Resolution no. 8/7374 of 28 May 2008;
- Lombardy Regional Government Resolution no. 8/1566 of 22/12/2005 – Implementation of the Consolidated Act no. 380 of 06/06/2001 - Structural and anti-seismic upgrading;
- Lombardy Regional Law no. 12 of 11/03/2005 as amended – Prevention of Geological, Hydrogeological and Seismic risks;

Law no. 1086 of 05/11/1971 – Rules for reinforced, normal, precompressed and with metal structures concrete works.

Rules on cultural heritage

Legislative Decree no. 42 of 22/01/2004 as amended – Cultural Heritage and Landscape Code, pursuant to article 10 of Law 6 July 2002, no. 137.

Rules on acoustics

Lombardy Regional Law no. 13 of 10/08/2001 – Rules on noise pollution;

Prime Minister's Decree of 05/12/1997 – Determination of passive acoustic requisites in buildings;

Law no. 447 of 26/10/1995 as amended – Framework law on acoustic pollution;

Prime Minister's Decree of 01/03/1991 – Maximum noise exposure limits in living environments and the external environment.

Rules on energy containment

Legislative Decree no. 48 of 10/06/2020 – Implementation of Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 which amends Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency;

Organisational Unit Director's Decree no. 18546 of 18/12/2019 – Update of the provisions for the energy efficiency of buildings approved by Decree no. 2456 of 8 March 2017;

Organisational Unit Director's Decree no. 2456 of 08/03/2017 – Additional provisions for the energy efficiency of buildings approved by Decree no. 176 of 12.1.2017 and overall re-approval of the provisions relating to the energy efficiency of buildings and the energy performance certificate;

Organisational Unit Director's Decree no. 176 no. 12/01/2017 – Update of provisions regarding regulations for the energy efficiency of buildings and the related energy performance certificate as replacement of provisions approved with Decrees no. 6480/2015 and no. 224/2016);

Lombardy Regional Government Resolution no. 224 of 18/01/2016 – Additional provisions regarding the discipline for the energy efficiency of buildings approved by Decree no. 6480 of 30/7/2015;

Lombardy Regional Government Resolution no. 6480 of 30/07/2015 – Provisions on the rules for the energy efficiency of buildings and the related energy performance certificate following the Lombardy Regional Government Resolution no. 3868 of 17.7.2015;

Lombardy Regional Government Resolution no. X/3868 of 17/07/2015 – Provisions on the rules for the energy efficiency of buildings and the related

energy performance certificate following the approval of the Ministerial Decrees of 26 June 2015 for the implementation of Legislative Decree no. 192/2005, as amended by Law no. 90/2013;

Interministerial Decree of 26/06/2015 – Adaptation of the Economic Development Minister’s Decree of 26 June 2009 - National guidelines for the energy certification of buildings;

Ministerial Decree of 26/06/2009 – National guidelines for the energy certification of buildings;

Lombardy Regional Government Resolution no. VIII/8745 of 22/12/2008 – Determinations concerning the energy certification of buildings in implementation of Legislative Decree no. 192/2005 and Arts. 9 and 25 of Lombardy Regional Law no. 24/2006;

Lombardy Regional Law no. 13 of 11/12/2006 – Rules on the prevention and reduction of atmospheric emissions for the protection of health and environment;

Legislative Decree no. 192 of 19/08/2005 – Implementation of the Directive 2002/91/EC regarding energy performance in building;

Presidential Decree no. 412 of 26/08/1993 as amended – Regulation containing rules for the design, installation, functioning and maintenance of heating systems in buildings with the purpose of limiting energy consumption, as implementation of article 4, subsection 4 of Law no. 10 of 9 January 1991;

Law no. 10 of 09/01/1991 as amended – Rules for the implementation of the national energy plan for the national use of energy, energy saving and development of renewable sources of energy.

Rules on environment

Legislative Decree no. 152 of 03/04/2006 as amended – Environmental rules;

Ministerial Decree no. 63 of 10/03/2020 – Minimum Environmental Criteria for service of public green management and supply of green care products;

Ministerial Decree of 11/10/2017 – Minimum Environmental Criteria for assigning design and work services for the new construction, renovation and maintenance of public buildings;

Interministerial Decree of 11/01/2017 as amended – Adoption of Minimum Environmental Criteria for interior furnishings, building and textile products;

Ministerial Decree of 27/09/2017 – Minimum Environmental Criteria for the acquisition of light sources for public lighting, the acquisition of equipment for public lighting, the assignment of the design service for public lighting systems;

Ministerial Decree of 05/02/2015 – Minimum environmental criteria for the purchase of street furniture;

Ministerial Decree of 07/03/2012 – Minimum Environmental Criteria for the assignment of energy services for buildings, lighting and motive power service, heating/cooling service;

Law no. 257 of 27/03/1992 as amended – Rules regarding the ceasing of the use of asbestos;

Ministerial Decree of 06/09/1994 – Regulations and technical methods for the application of article 6, subsection 3 and article 12, subsection 2 of Law no. 257 of 27 March 1992 on the ceasing of the use of asbestos;

Ministerial Decree of 20/08/1999 – Extension of the regulations and technical methods for reclamation work, including those to render asbestos harmless, provided for by article 5, subsection 1, letter f) of Law no. 257 of 27 March 1992;

Lombardy Regional Law no. 13 of 29/09/2003 – Rules for environmental remediation, reclamation and disposal of asbestos;

Lombardy Regional Law no. 14 of 31/07/2012 – Amendments and integrations to Regional Law no. 17 of 29 September 2003 “Rules for environmental remediation, reclamation and disposal of asbestos”;

Legislative Decree no. 36 of 13/01/2003 – Implementation of Directive 1999/31/EC on waste landfills;

Lombardy Regional Government Resolution no. 8/1526 of 22/12/2005 – Approval of the “Regional Asbestos Plan for Lombardy” (PRAL) pursuant to Regional Law no. 17 of 29 September 2003;

Lombardy Executive Decree no. 13237 of 18/11/2008 – Approval of the “Protocol for the assessment of the state of preservation of asbestos cement roofs” and simultaneous repeal of the algorithm for the assessment of asbestos cement external roofs;

Regulation (EC) no. 790/2009 of the Commission of 10 August 2009 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) no. 1272/2008 of the European Parliament and Council on classification, labelling and packaging of substances and mixtures;

Lombardy Regional Decree no. 13541 of 22/12/2010 – Approval of the guidelines for the remediation of laid items containing Synthetic Glass Fibres;

State-Regions Conference of 10/11/2016 – Pact between the Government, the Regional Administrations and the autonomous Provinces of Trento and Bolzano on the document regarding “Synthetic Glass Fibres (SGF): guidelines for the application of regulations concerning exposure risks and prevention measures for health protection - Update 2016”;

ARPA Lombardy Guidelines on underground tanks of 15/03/2013, available at the link: https://www.arpalombardia.it/sites/DocumentCenter/Documents/Linee%20Guida%20tecniche%20sui%20serbatoi%20interrati/LG_BN_001Serbatoi_interrati.pdf.

Rules on public green areas

Lombardy Regional Government Resolution no. XI/2658 of 16/12/2019 – Update of the black lists of allochthonous animal and plant species subject to monitoring, containment or eradication - replacement of Annexes D and E to Lombardy Regional Government Resolution no. 7736/2008 (article 1, subsection 3 of Regional Law no. 10/2008);

Standard EN 14974:2019 – Installations for users of roller sports equipment;

Standard UNI EN 1177:2019 – Coatings of playground surfaces for impact mitigation;

Standard EN 1176-1:2018 – Equipment and surfaces for playgrounds;

Standard EN 16630:2015 – Permanently installed outdoor fitness equipment - Safety requirements and test methods;

Standard UNI 11306:2020 – Benches - Safety requirements and test methods;

Standard EN 14974:2019 – Equipment for users of roller sports equipment - Safety requirements and test methods;

Standard EN 15312:2010 – Open access sporting equipment - Requirements, including safety, and test methods;

Ministerial Decree of 12/10/2012 – Emergency measures to prevent the introduction and spread of *Anoplophora chinensis* (*Citrus long-horned beetle*) in the territory of the Italian Republic;

Ministerial Decree of 29/02/2012 – Emergency measures for the prevention, control and eradication of coloured canker caused by *Ceratocystis Fimbriata*;

Standard EN 15312:2010 – Free access sporting equipment.

Rules on the elimination of architectural barriers

Plan for the Elimination of Architectural Barriers of the Municipality of Milan (P.E.B.A. MI);

Presidential Decree no. 503 of 24/07/1996 – Regulations containing rules for the elimination of architectural barriers in public buildings, spaces and facilities;

Ministerial Decree no. 236 of 14 June 1989 – Technical instructions required to guarantee accessibility, adaptability and visibility of private buildings and subsidised public residential buildings, for the overcoming and elimination of architectural barriers;

Lombardy Regional Law no. 6 of 20/02/1989 – Rules on the elimination of architectural barriers and technical implementation instructions.

Rules on safety and fire prevention issues

Ministerial Decree of 03/08/2015 as amended – Approval of technical fire prevention rules pursuant to article 15 of Legislative Decree no. 139 of 8

March 2006;

Ministerial Decree of 07/08/2021 – Provisions for submitting applications concerning fire prevention procedures and the documentation to be attached thereto, pursuant to article 2, subsection 7 of the Presidential Decree no. 151 of 1 August 2011;

Protocol note no. 6334 of 04/05/2012 – Clarifications to DCPREV protocol note no. 1324 of 7 February 2012 “Guide to the installation of photovoltaic systems - 2012 Edition”;

DCPREV protocol note no. 1324 of 07/02/2012 – Guide to the installation of photovoltaic systems - 2012 Edition;

Presidential Decree no. 151 of 01/08/2011 – Regulation containing the simplification of fire prevention procedure rules, in line with article 49, subsection 4-quater of Decree-Law no. 78 of 31 May 2010, converted with amendments, by Law no. 122 of 30 July 2010;

Legislative Decree no. 81 of 09/04/2008 as amended – Implementation of article 1 of Law no. 123 of 3 August 2007, on health and safety at work;

Ministerial Decree of 09/03/2007 – Fire resistance of buildings in activities subject to controls by the national fire service;

Ministerial Decree of 16/02/2007 – Classification of fire resistance of construction products and elements used in construction work;

Ministerial Decree of 15/03/2005 as amended – Fire reaction requisites of construction products installed in activities governed by specific technical fire prevention provisions based on the European classification system;

Ministerial Decree of 10/03/2005 as amended – Fire reaction categories for construction products to be used in works for which a safety requisite in the event of fire is prescribed;

Ministerial Decree of 07/01/2005 – Technical and procedural rules for the classification and approval of portable fire extinguishers;

Ministerial Decree of 03/11/2004 as amended – Provisions for the installation and maintenance of devices for opening doors installed along escape routes, regarding safety in the event of fire;

Ministerial Decree of 10/03/1998 – General safety criteria for fire prevention and for managing emergencies in the workplace;

Ministerial Decree of 19/08/1996 as amended – Technical Regulations for fire prevention in the design, construction and running of entertainment and public spectacle structures;

Ministerial Decree of 30/11/1983 as amended – Terms, general definitions and graphic symbols used in fire prevention.

Rules on infrastructures and transport

Municipal Council Resolution no. 14 of 27/03/2013 – Update of the General Urban Traffic Plan (PGTU);

Ministerial Decree no. 137 of 02/05/2012 – Guidelines for the management of road infrastructure safety pursuant to article 8 of Legislative Decree no. 35 of 15 March 2011;

Ministerial Decree of 28/06/2011 – Provisions on the use and installation of road restraint devices;

Legislative Decree no. 35 of 15/03/2011 – Implementation of Directive 2008/96/EC on road infrastructure safety management;

Ministerial Circular of 21/07/2010 – Uniform application of the rules on the design, approval and use of restraint devices in road construction;

Ministerial Directive no. 3065 of 25/08/2004 – Directive on criteria for the design, installation, testing and maintenance of restraint devices in road construction;

Ministerial Decree of 21/06/2004 – Update of the technical instructions for the design, approval and use of road safety barriers and the technical prescriptions for the testing of road safety barriers;

Ministerial Decree of 19/04/2006 – Functional and geometric standards for the construction of road intersections;

Ministerial Decree no. 6792 of 05/11/2001 as amended – Functional and geometric standards for road construction;

Ministerial Directive of 24/06/1995 – Directives for the drafting, adoption and implementation of urban traffic plans (article 36 of Legislative Decree no. 285 of 30 April 1992 - New Highway Code);

Legislative Decree no. 495 of 16/12/1992 as amended – Regulation of execution and implementation of the New Highway Code;

Legislative Decree no. 285 of 30/04/1992 as amended – New Highway Code.

Estimations

2021 Regional Public Works Price List – Lombardy Region – vol. 1.1, 1.2, 2.1, 2.2, and vol. of technical specifications;

Measurement and Evaluation Standards contained as an integral part of vol. 1.1, 1.2, 2.1 and 2.2 of 2021 Regional Public Works Price List.

And in addition:

Standard UNI EN 12453:2017 – Industrial, commercial and garage doors and gates - Safety in use of powered doors - Requirements and test methods;

Legislative Decree no. 17 of 27/01/2010 as amended – Implementation of Directive 2006/42/CE, regarding machinery that amends Directive 95/16/CE on lifts;

Ministerial Decree no. 37 of 22/01/2008 as amended – Regulation regarding the implementation of article 11-quaterdecies, subsection 13, letter a) of Law no. 248 of 2 December 2005, on the reorganisation of provisions on the installation of systems inside buildings;

Ministerial Decree of 01/04/2004 – Guidelines for the use of innovative systems in environmental impact assessments;

Standard UNI EN 81-40:2009 – Safety rules for the construction and installation of lifts - Special lifts for the transport of persons and goods - Part 40: Stair lifts and lifting platforms that move on an inclined plane for people with reduced mobility;

Standard CEI 64-8 – Electrical installation rules;

Standard UNI EN ISO 9001:2015 – Quality management systems - Requirements;

Specific UNI standards for particular performances foreseen by project works or materials.

