Comune di Milano

BEIC
BIBLIOTECA EUROPEA DI INFORMAZIONE E CULTURA

INTERNATIONAL DESIGN COMPETITION

NUOVA BEIC

Biblioteca Europea di Informazione e Cultura

NUOVA BEIC

Biblioteca Europea di Informazione e Cultura

Preliminary Design Document

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foreword

Nuova B.E.I.C. - Biblioteca Europea di Informazione e Cultura project has been included in the interventions list provided by the "Strategic investments plan on cultural heritage sites, buildings, and natural areas" within the framework of the National Plan for complementary investments to the National Recovery and Resilience Plan (P.N.R.R.), approved by Decree of the President of the Council of Ministers of 8 October 2021 with a funding of € 101,574,000.00.

The Government's decision offers a unique opportunity to build a long-awaited project of great cultural importance in Milan, which had already been the subject of an International Design Competition won by the ATI B.E.I.C. Milano group in 2001, but whose construction was interrupted due to a combination of general (the 2008 global financial and economic crisis) and local factors.

The project resumption, however, leads to the awareness that it is not possible to resume and re-propose sic et simpliciter the original B.E.I.C. project. The first two decades of the 21st century have seen a profound revision of the functions of a contemporary library, which has evolved from a study and consultation place to a more complex dimension, linked to lifelong learning needs, digital culture and the concept of circular dissemination of knowledge as a prerequisite for the creation of new knowledge and skills.

The rethinking of the library role is primarily a strategy for responding and adapting to context changes, which have become more evident in urban areas. Large metropolitan areas are now highly complex places, characterised by technological density and rapidity of change, which require increasingly widespread intelligence and people capable of giving value to diversified contexts of experience and of increasingly equipping themselves with new cognitive tools. Increasing willingness to change and ability to make competent and creative use of technology and information are the qualities required of citizens of contemporary metropolises, together with the demand for an 'augmented' set of skills and qualities and an increasing willingness to update one's cognitive potential throughout life.

The rapid development of digital technologies has questioned the paradigm of possession as a prerequisite for cultural fruition in favour of access to knowledge, which takes place dynamically, without mediation and temporal deferral. This paradigm shift - to which has also been superimposed the passage from the vertical distinction between producers and consumers of culture to a model of horizontal production and fruition, which can be experienced by every individual who has a network connection and a digital device at his disposal - has exponentially increased the possibility of accessing information, but has also laid bare, to a much greater extent than in the past, the centrality of skills as a discriminating factor between inclusion and marginality. Nowadays, the inadequacy of skills represents the real contemporary discriminating factor for active

participation in economic and social life, the factor that produces and consolidates inequalities and creates new illiteracy.
The Municipality of Milan and the B.E.I.C. Foundation believe that in this "plural" and complex context, a library, conceived as a programmatically hybrid device, open to the contribution of a multiplicity of actors and able to integrate elements of different cultural backgrounds, can make a difference.
These reasons, linked to the trends that are changing the reference context for libraries from the basis, are combined with other, equally compelling reasons, such as the inadequacy of the structural and plant engineering solutions identified in 2001, the evolution of Italian anti-seismic, fire prevention, energy, environmental sustainability, and hydraulic invariance legislation, the priority needs to contain soil consumption and costs of building and running the library when it will be fully operational, as well as the radical change in the project perspective, which envisages the B.E.I.C. taking over directly the functions of central library of the Municipality of Milan, currently carried out by the Sormani Library.
Therefore, the resumption of activities has required, on the one hand, a review of the librarianship and functional assumptions underlying the original B.E.I.C. project to identify the parts that are still current, those that need updating, and the elements not present in the 2001 project, which are now essential components of a modern public library, and, on the other, the search for adequate levels of environmental, managerial and economic sustainability.
The only choice made in full continuity with the original project is to keep the Institute name unchanged, as it is expression of a cultural horizon that constitutes its raison d'être and represents its distinctive features.

Biblioteca (transl. "library"). The purpose is not to create a generic "cultural space", but a multi-functional structure, characterised by being a place of access to knowledge through different languages of communication, capable of offering services for study and research, especially of an interdisciplinary nature, often uncomfortable in university libraries, as well as opportunities for participation and cultural production, learning opportunities, stimulation of imagination and individual creativity. Since it is a library, its activities will be based on the presence of several important collections, both physical and digital, available both physically on-site and through the network.

Europea (trasl. "European"). European civilisation is the heart and reference point of the cultural project of the *Nuova B.E.I.C.* The European vocation will be realized by paying particular attention to the documentation of the history, culture, languages and socio-

economic reality of the European continent and by a systematic commitment to educating younger generations in the European dimension of collective life. The tolerance culture and the education in the values of respect for cultural diversity, civil rights, and freedoms, with particular attention to the contemporary evolution of these values, which are fundamental to civilisation, not only in the West, will inform the cultural promotion activities of the library, stimulating a dialectical comparison with the main cultures and civilisations of the world. Indeed, in this sense, the *Nuova B.E.I.C.* will be a true "world library", a dialectical crossroads of cultural exchange in a city (and a region) that continues to be a great international attraction. In addition, the library will pay particular attention to documenting the history and role of Milan as European cultural, economic, and scientific capital and the contribution of Milanese culture to the common European identity, highlighting periods, movements, historical episodes, cultural, economic, and social trends which constitute the building blocks of Milanese identity.

Informazione (trasl. "Information"). The role of the *Nuova B.E.I.C.* with respect to information access needs, will be oriented not only towards guaranteeing widespread access to information sources, but above all towards facilitating the acquisition of a greater capacity to use them by users. The development of search engines and mobile internet access technologies have profoundly changed the information-seeking behaviour of most of the population worldwide. This is a global and probably irreversible phenomenon, which has further reduced the attractiveness of libraries as places where citizens get information. The phenomenon that the *Nuova B.E.I.C.* must prioritise is the growth of functional illiteracy, technological gaps and information asymmetries, due to which many people are penalised not only in terms of access to culture but also in terms of access to services, the world of work and welfare opportunities. Attention to this phenomenon will be a distinctive feature of the *Nuova B.E.I.C.* activities: information literacy and media literacy services will be the key component of the new library.

Cultura (trasl. "culture"). The *Nuova B.E.I.C.* should encourage a wide range of audiences to approach the heritage of ideas, concepts, traditions, and memories that characterise human history and culture through a rich and continuous programme of meetings and debates and events, actively taking part in the main Milanese and national cultural events. The new library will promote the cultural participation of citizens as an independent value, but also as a powerful catalyst of sociality, resources and skills existing in the Milanese and Lombardy communities and institutions. The *Nuova B.E.I.C.* will be an experiential space available to anyone wishing

to experience the emotion of contact with the creative heritage of humanity, not limited to the literary sphere, but strongly focused on the enhancement of European civilisation in a continuous and constructive comparison with other cultures. Particular attention will be aimed at the youngest - children and teenagers - so they can approach the various expressive languages and forms of artistic production in an immediate, fun and engaging way. The spaces dedicated to this particular audience will be scenographic, immersive and periodically redesigned to continue to surprise, amaze and give space to the imagination of future generations of readers. Finally, the new library will be a platform available to the young creative generations of the city to bring the memory of Milan alive and relevant, through artistic languages and their contamination, and to provide new and original keys to understanding its future.

The concept development of the *Nuova B.E.I.C.*, starting from these assumptions, outlines a completely different library, capable for introducing and elaborating the main lines of the evolution that the library concept has undergone in the last fifteen years, which requires the highest quality levels to be fully realized. For these reasons, the *Nuova B.E.I.C.* project will be awarded by means of this International Design Competition, which will consist of a single stage.

chapter 1 OBJECTIVES OF THE COMPETITION

The objective that the Municipal Administration of Milan is pursuing through this International Design Competition is to start the **construction of the Nuova B.E.I.C. - Biblioteca Europea di Informazione e Cultura** which, according to the rules governing the use of the resources of the National Plan for complementary investments to the National Recovery and Resilience Plan, must be completed by 30 June 2026 and tested within the following six months.

The work, of great interest for Milan, both for the excellence of its function and for the impact the work itself will have on the urban redevelopment process, will be built in an area located in the eastern part of the city, between Via Cervignano, Via Monte Ortigara and Viale Molise, once occupied by the Porta Vittoria railway station. The area, as will be illustrated in the next chapter, was part of an ambitious urban plan that remained unfinished until a few years ago due to a long process recently concluded, as a result of which the buildings along Via Giovanni Cena were completed and the construction of a new public park of 30,000 sqm was started, where the B.E.I.C. was to be built according to the original project. The decision, taken in the meantime, to build the park arise from the desire to give an answer to the inhabitants of the neighbourhood and to the citizens who were already settling in the neighbouring buildings.

The project area is located in a semi-central position, about 3 km from Piazza del Duomo. It is barycentric compared to the main Milanese universities and is well connected to the metro and regional railway lines: it is in fact located near the Porta Vittoria station of the *Passante Ferroviario* (the main eastern station of the metropolitan and regional railway system) and the Dateo station both of the Passante and of the new M4 metro line, which will connect the city centre with Linate Airport in a few minutes.

The project will allow the redevelopment of the former Porta Vittoria railway station area, through the construction of a new cultural centre with unique characteristics at national level and of fundamental importance for the city: a large infrastructure for access to knowledge, a hub of experimentation and digital research applied to cultural heritage, a centre for learning digital skills and an experiential space, in which all citizens will be able to experience the main languages of cultural production. Also in this sense, the *Nuova B.E.I.C.* represents a symbol of redemption with respect to a place that, for alternate events, has long been a wound in the neighbourhood and, more generally, in the city.

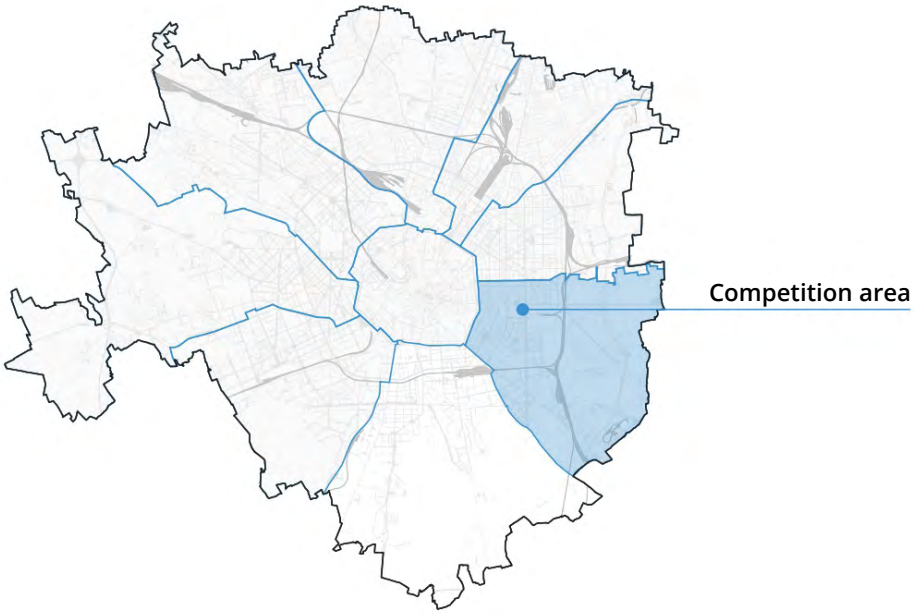
The ambition is to create a new-generation library centre capable of becoming the driving force of an integrated, innovative and high-performance library system in the metropolitan area; to develop

research and development programs in synergy with Milanese universities; to contribute both to the development of the Lombardy library system, assuming some functions of regional emanation, and to the implementation of national programmes to reduce the digital divide, to fight against educational poverty and to reduce the information access gap. A profile and potential that will not fail to attract the interest of a multiplicity of private subjects, who will be capable - through qualified partnerships - of sharing with the *Nuova B.E.I.C.* programmes of common interest, contributing to its life and further development.

chapter 2 FRAMEWORK

The Competition area, where the *Nuova B.E.I.C.* will be built, is located in the eastern part of the Municipality of Milan, more precisely in Municipality 4 (fig. 1).

fig. 1
Framework of the Competition area.



With reference to the Local Identity Units (N.I.L.), introduced by the Territorial Development Plan (P.G.T. "Milano 2030"), the area is part of the Umbria-Molise-Calvairate district[1], bordering to the east with the Ortomercato area and the Corsica district, while to the north and west with the XXII Marzo district.
In recent decades this part of the city has been the subject of numerous interventions and projects that have contributed and will contribute to the transformation of the neighbourhood, specifically those sites, which are the emblems of its industrial and productive past. As will be seen in the following paragraphs, the most significant transformations include the recovery of the Palazzo dei Frigoriferi, the redevelopment of the Ex Macello area and the construction, currently nearing completion, of a new public park in the area once occupied by the Porta Vittoria railway station. The new park is part of the Porta Vittoria Integrated Intervention Programme (P.I.I.), as well as the *Nuova B.E.I.C.*, for which a first Design Competition was held in 2001. However, the winning project was not realized due to lack of funding. Twenty years later, the B.E.I.C. has been included in the list of "major cultural attractors" of the P.N.R.R., making its realisation possible in the next few years.

[1] For further information see the link: http://allegati.comune.milano.it/territorio/PGT_NIL/NIL_28.pdf

2.1 HISTORICAL BACKGROUND

• 19th century development

Looking back at the urban development of Milan, the expansion of the city has never been uniform, in all directions.

If we look at the *Carta topografica dei contorni di Milano* (fig. 2) by Giovanni Brenna (1833), we can observe that in those years the area to the east of the so-called Spanish walls was characterised by the presence of an eastbound axis (today Corso XII Marzo / Viale Corsica), a south-eastbound axis (today Corso Lodi) and a north-eastbound axis (starting from Porta Orientale, today Porta Venezia), from which the main connections with the territories to the east of Milan developed.

In this part of the city, agricultural areas prevailed over other parts where the first industrial activities settled over time: in the eastern part there were no villages/settlements and, with the exception of the farmsteads, among the most significant functions, some of which still remain today, we can mention the Senavra, the Foppone di Porta Tosa and the austrian Fortino (dating back to 1888).

Over the years, the eastern axis (Corso XII Marzo / Viale Corsica), with its presence, has determined the geometry on which streets and blocks have been laid out in the expansion plans of the city. This axis followed the layout of the Naviletto, i.e. the waterway which, it is assumed, had been used in the 12th century to connect the Lambro river with the inner trench of the Navigli in vain. Precisely the east-west route of the Naviletto and the section of the 16th-century Bastioni almost perpendicular to it have organized the urban development of the city since the end of the 19th century.

fig. 2
Carta topografica dei contorni di Milano by Giovanni Brenna (1833).
Source: Civica Raccolta delle Stampe Achille Bertarelli, Castello Sforzesco, Milan

• the first Master Plan

The Master Plan (fig. 3) drawn up by engineer Beruto in 1884, with a variant in 1889, outlines the expansion plan of the city, including the area between the Bastioni and the present-day boulevards Umbria/Piceno/dei Mille/Abruzzi.

The outer boundary of the plan – represented by the aforementioned boulevards – also represented, for a few decades, the morphological and typological boundary of the compact city. On the western side of the boulevards, towards the city centre, the current dense urban fabric almost entirely by residential buildings has been formed. On the eastern side, towards the countryside, another type of building remained for decades, made up of modest warehouses and rudimentary factories with wooden structures, some of which were later replaced by more consolidated industrial buildings.

A particularly significant feature of the Beruto Plan is the exceptional (for Milan) coherence between the green areas and public spaces

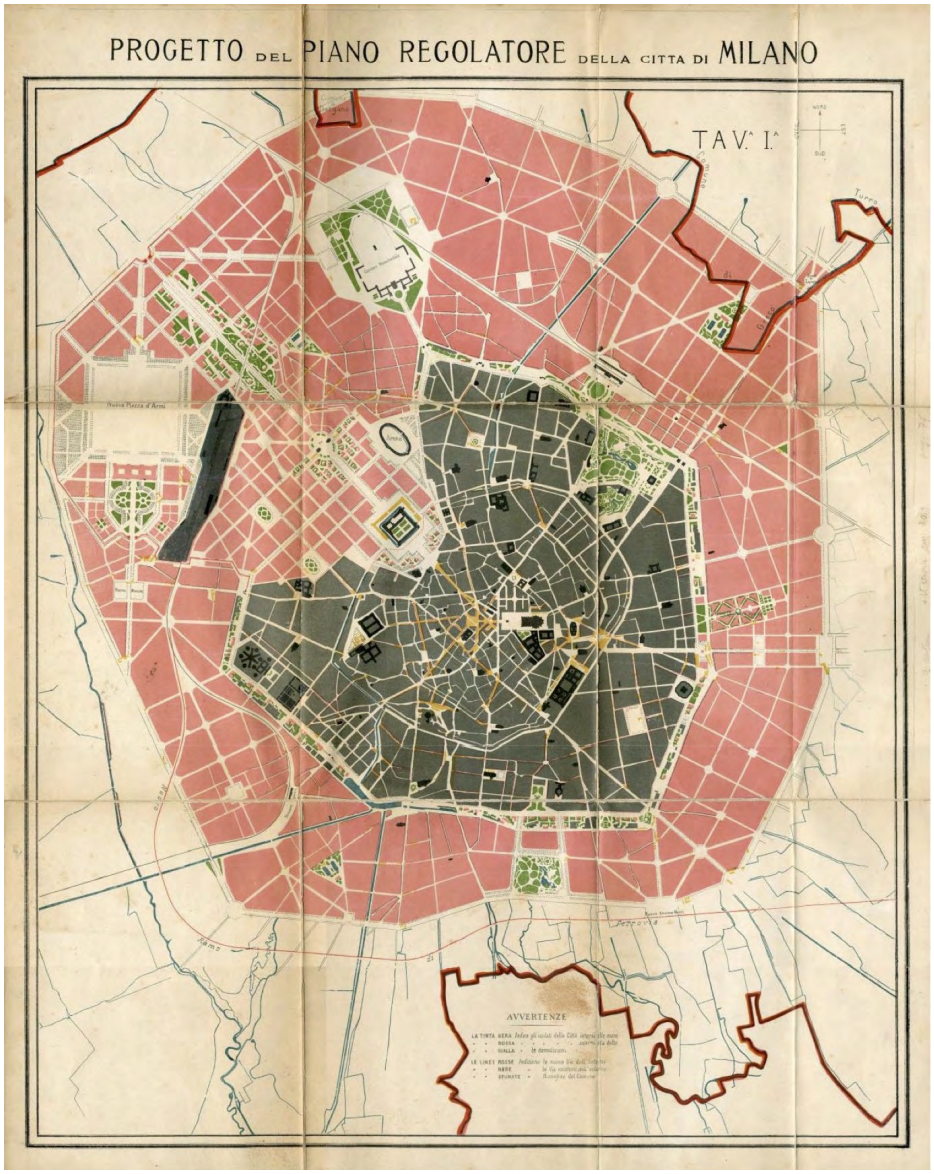


fig. 3
Beruto Master Plan (1884).
Source: Civica Raccolta delle Stampe Achille Bertarelli, Castello Sforzesco, Milan

system design and the building design. The green areas and the system of public spaces play a major role in the configuration of many axes: the streets Tiraboschi/Cadore (about 600 m), the streets Lazio/ Cirene (about 800 m) and Piazzale Libia at their intersection; the already mentioned boulevards Umbria/Piceno/dei Mille/Abruzzi; the axis Concordia/Indipendenza/Plebisciti/Argonne, from Piazza del Tricolore in the west to the Church of Saints Nereo and Achilleo in the east.

• the second Master Plan

With the Master and Expansion Plan (fig. 4) by engineers Pavia and Masera, dating back to 1910, the expanding process of the city beyond the boundary of the aforementioned boulevards continued, providing for a new road network. The railway network was also redesigned, influencing the layout of the entire city to this day. Specifically, to the east it was decided to locate the new Porta Vittoria freight yard (1911) to serve the Milanese rationing area, which soon will become the most important in Italy. The rationing area consisted of:

- Fruit and Vegetable Market, the so-called "Verziere", which replaces the more central one in Piazza Santo Stefano, which was relocated to the outer parts of the city like other important infrastructures. Situated in the area between Corso XXII Marzo, Viale Umbria, Via Anfossi and Via Cadore, the Market was built between 1911 and 1922, according to a project by the architect Alberto Migliorini, on the area formerly occupied by the austrian Fortino and was built around a central core. It was demolished in 1965, with only the central bar remaining (now "Palazzina Liberty Dario Fo e Franca Rame"), located in the Vittorio Fomentano Park and used as a concert hall;
- new Fruit and Vegetable Market, known as "Ortomercato", located since 1965 in Viale Lombroso, is still in operation and undergoing redevelopment, as explained in paragraph 2.3;
- Municipal Slaughterhouse, Livestock Market, Meat Market, in Viale Lombroso, completed by engineer Antonio Cecchi in 1929, was completely decommissioned in 2005. In 2019 the area, known as "Ex Macello", was selected to participate in the second edition of the Reinventing Cities international programme, as well as the Palazzine Liberty in Viale Molise, which originally served as the office, concierge and residence of the rationing town. For more information on the outcome of Reinventing Cities, competitors are invited to see paragraph 2.3;
- Poultry Market, located in Viale Molise, opened in 1925, remained active until 2016. This area was also included in the Reinventing Cities – Ex Macello programme;
- Flower Market, Fish Market and the new Refrigerated Warehouse, in Viale Lombroso, built to replace buildings that had become unsuitable for their functions.

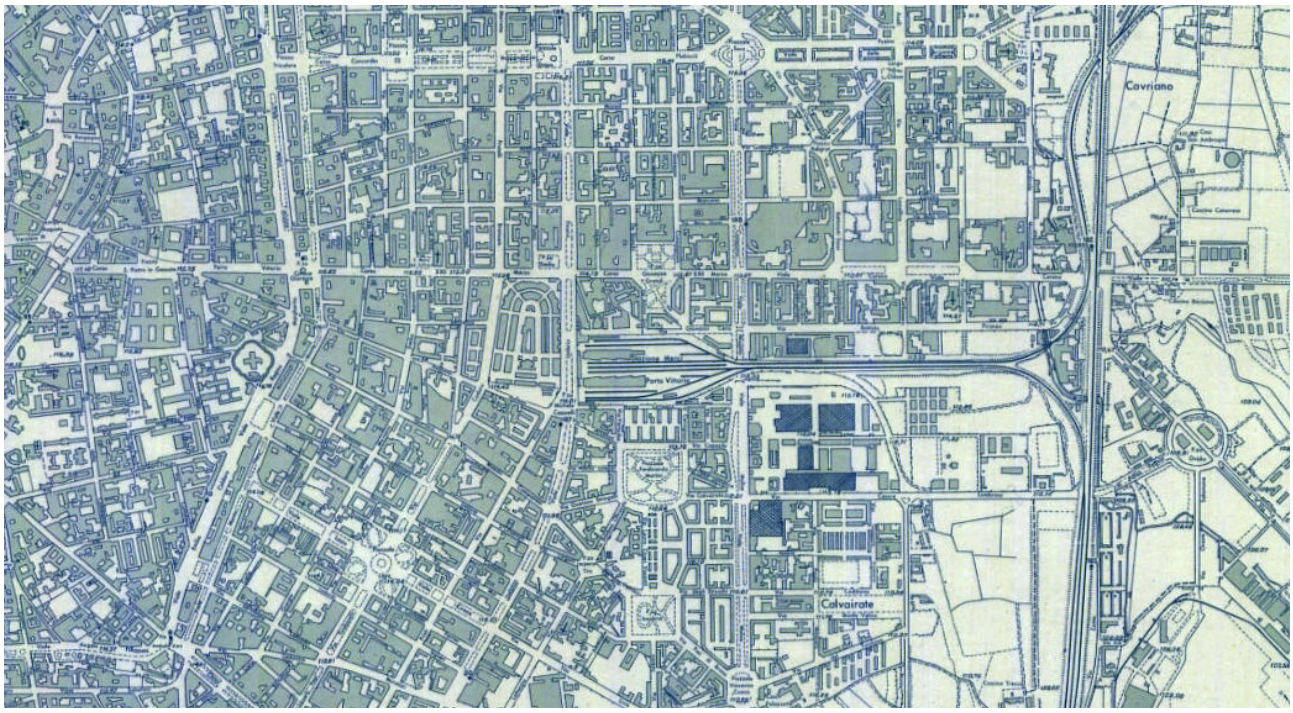
fig. 4
Pavia Masera Master Plan (1910).
Source: Civica Raccolta delle Stampe Achille Bertarelli, Castello Sforzesco, Milan

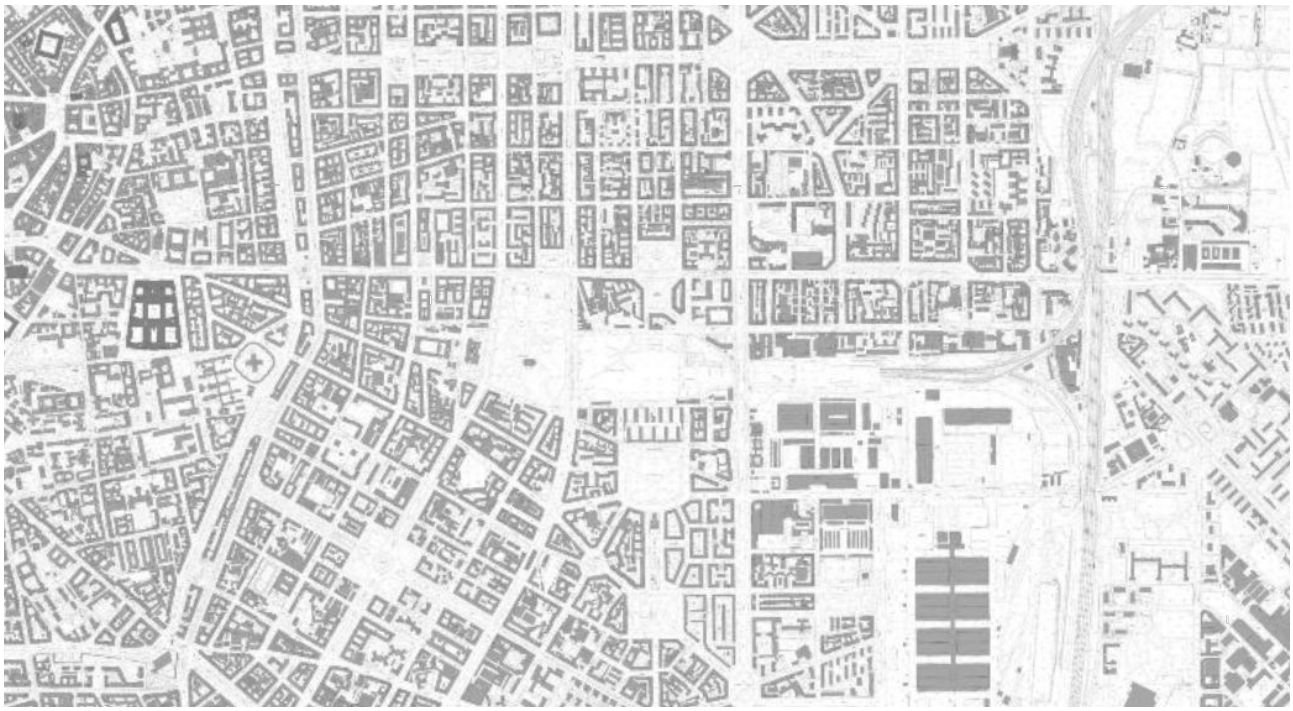
The slow and long construction of rationing town (figs. 5 and 5A) - which is still undergoing transformation - laid the basis for the completion of the surrounding urban fabric through the construction of large public housing complexes, mainly on the initiative of the Istituto Autonomo Case Popolari (I.A.C.P.):

- "Calvairate" district of Viale Molise, 1929;
- "Molise"district of Viale Molise, 1933-1938;
- "Ponti" district of Via del Turchino, 1942;
- "Martini" district, in the square with the same name, 1948-1951.

fig. 5
Excerpt from the Technical Map (1956).
Source: Geoportale del Comune di Milano

fig. 5A
Excerpt from the Technical Map (2006).
Source: Geoportale del Comune di Milano





• the Porta Vittoria station

In 1905 Ferrovie dello Stato was set up and then the Pavia Masera Master and Expansion Plan was used to reorganise the Milanese railway system, which, in addition to the construction of the Stazione Centrale, included the construction of the Porta Vittoria station near the then Fruit and Vegetable Market.

The Porta Vittoria station came into operation in 1911 and remained a freight station until the Second World War, after which it was also used for local passenger services.

Local traffic was discontinued in 1984. However, the station remained served by some goods trains until its decommissioning in 1991. In 2004 it was formally closed, as it was replaced by the new underground station of the Passante Ferroviario (figs. 6 and 7), located a few hundred metres to the east of the old station. As will realize in detail in paragraph 2.3, the station contains a series of spaces involved in the “Artepassante” project.

fig. 6
West-east aerial view of the former Porta Vittoria yard, september 2000.
In the foreground, Viale Umbria axis.
ph. Andrea Micheli

fig. 7
North- east aerial view over Via Giovanni Cena, september 2000.
ph. Andrea Micheli

2.2 THE PORTA VITTORIA P.I.I.

The area subject to the Competition is part of a transformation area ruled by the Urban Renewal and Sustainable Land Development Programme (P.R.U.S.S.T.) and more specifically by the Porta Vittoria Integrated Intervention Programme (P.I.I.).
In 1983 the Lombardy Region, the Municipality of Milan, the Azienda Autonoma Ferrovie dello Stato and Ferrovie Nord Milano S.p.A. signed a general agreement to regulate the relations deriving from the construction of the Passante Ferroviario between Milano Porta Garibaldi and Milano Porta Vittoria, as well as the related connections with the existing Ferrovie dello Stato and Ferrovie Nord lines. With the construction of the Passante, the agreement specified that, following the underground construction of the new Porta Vittoria station - which would have freed up surface areas owned by Ferrovie dello Stato - it was necessary to proceed with a town planning variant to define the settlement size of the new buildings to be planned, the functional uses and the areas to be reserved for public spaces.
The following year, on the basis of the reflections already begun in the framework of the aforementioned agreement, the Director Document of the Passante Ferroviario Project identified the areas of the railway yard and the nearby municipal slaughterhouse, as areas for foreseeable disposal and reuse and in 1988 the same areas have been defined as a "strategic transformation area", proposing a generic residential, commercial and tertiary destination.
In 1989, the Municipality of Milan entrusted the Politecnico di Milano with a research aimed at deepening the possible and more interesting site refunctionalization. The idea of locating, among other functions, a new "temple" for culture, i.e. a library building of excellence, was put forward and to this end, in December 1996, the "Milano Biblioteca del 2000" Association was founded, with the participation of the Lombardy Region, the Province of Milan and the Municipality of Milan identifying, at the beginning of 1998, in the area of the former Porta Vittoria railway yard the most suitable site for the location of the so-called "Great Library".
Following the decommissioning of the railway systems and the construction of the new underground station at Milano Porta Vittoria to serve the Passante Ferroviario, as well as the elimination of pre-existing infrastructures and railway services on the surface, the Decree of the Minister of Public Works of 8 October 1998 regulates the promotion of innovative urban programmes called P.R.U.S.S.T., which are used for the redevelopment and transformation of the urban area in question. These programmes aim to favour the construction, adaptation and completion of both network and punctual facilities, and residential, industrial, commercial, handicraft, tertiary, tourist-receptive and for services settlements at territorial and urban level,

stimulating the activation of sustainable development occasions from an economic, environmental and social point of view through the joint use of resources coming from different sources, public and private, finding space specially in parts of the city characterized by infrastructural deficits and lack of services.

As a result of the promotional activities activated by the Administration, and aimed at collecting proposals consistent with the programmatic indications published in Resolution no. 23 of 29 March 1999, the Municipality of Milan welcomed the proposal presented by the company Metropolis S.p.A. for the urban redevelopment of the disused railway yard through the establishment of new tertiary, receptive, residential and commercial functions, as well as the Promoting Committee's proposal regarding the construction of the "Great Library B.E.I.C." and, finally, the proposal of A.L.E.R. relating to the renewal of the historic districts of "Molise" and "Calvairate" public housing, to be included in the wider perimeter of the P.R.U.S.S.T.

The aforementioned proposals formed a single P.R.U.S.S.T. called "Passante Ferroviario - Porta Vittoria station: valuable functions and urban regeneration", approved with Provision no. 2160 of 29 July 1999.

In June 2000 the City Council, confirming the interventions provided for in the P.R.U.S.S.T., identified the "Integrated Intervention Programme" (P.I.I.) as the most suitable executive instrument to regulate the building initiatives in the former railway yard area. This area, in fact, first occupied by the Porta Vittoria station then by its abandoned spaces with consequent degradation phenomena, represented a physical barrier to the reconnection of the surrounding urban fabric, conformed over the years according to a development scheme that, in fact, has led to the establishment of four urban facades strongly uneven:

- a western façade composed by a 19th and 20th century district, with a purely residential character, an expansion of the historical center, overlooking the Vittorio Fomentano Park, separated from the former Porta Vittoria railway yard area by Viale Umbria;
- a northern façade between Via Giovanni Cena and Corso XXII Marzo, characterized by blocks that are not homogeneous for types and functions, with largely old and disorganized buildings;
- a southern façade along Via Monte Ortigara, composed of residential and tertiary buildings of little value, recently built;
- an eastern façade characterized by the presence of the progressively buried railway line, with a strong impact in terms of settlement: beyond Viale Molise develop functions, such as the Fruit and Vegetable Market, the Meat Market and the Municipal Slaughterhouse.

The objective of the P.I.I. is, in fact, the urban, building and environmental redevelopment through the creation of a mix of

functions, including those related to public infrastructures or those of public interest, the use of integrated modes of intervention, also aimed at the implementation and strengthening of urbanisation, as well as the promotion of territorial relevance interventions, with the ambition of also proposing and introducing more strictly qualitative elements capable of giving resonance to the intrinsic value of the area and to the planned transformations within it, as well as accompanying the transformation with suitable infrastructures aimed at adequately supporting the creation of new functions within the area.

According to this order of intent, in March 2001, the President and the Councillor for Land and Urban Planning of the Lombardy Region and the Mayor and the Councillor for Land Development and Street Furniture of the Municipality of Milan signed a Programme Agreement about the P.I.I. to implement the urban redevelopment of the former railway yard, thus handing back the large disused area to the city. The redevelopment includes the installation of a mix of private functions and prestigious strategic functions such as the Great Library, for the design of which the Municipality of Milan launched an International Competition at the end of which, in November 2021, the winner was the project developed by the ATI B.E.I.C. Milano, a group composed by Bolles+Wilson GmbH & Co. KG (as group leader), Alterstudio Partners srl and AHW Ingenieurgesellschaft mbH Degenhardt GmbH.

In order to implement the objectives, set out in the agreements, in May 2002 the Municipality of Milan and the developer and promoter of the Programme proposal, signed an agreement which envisages the construction of privately-owned building volumes, located in the northern portion facing Via Cena, consisting of approx. 16,761 sqm for residential use, approx. 14,526 sqm for commercial spaces and approx. 24,582 sqm for tertiary and receptive functions. The central axis of the area, along Via Monte Ortigara and Via Azzurri d'Italia, is destined for public works, such as the Great Library, to be built on an area of approx. 26,230 sqm (subsequently extended), with the addition of green spaces, pedestrian paths and a sports facility, as well as areas for the development of mobility infrastructures and areas to support the Library.

Following the company's vicissitudes which affected the property in 2007, and a series of technical difficulties that emerged during the construction of the works, in 2011 the need arose to update the terms of the signed agreements, also with respect to the urban transformations that affected the area in the years following the activation of the agreements, with the consequent need to redefine the functional mix by providing residential areas for approx. 27,316 sqm, commercial areas for approx. 8,905 sqm and tertiary functions for approx. 19,703 sqm, as well as a more articulated and structured sports facility than previously established.

Despite the revision of the agreements, the difficulties that emerged in the implementation of the works led to a gradual halt of the urban transformation works in the area and, in 2014, in order to return a portion of the urban fabric to the city, it was agreed to bring forward the use of the area earmarked for the construction of the Great Library (waiting to be built as a result of the failure to find the necessary economic resources), through the creation of a green space.

Unfortunately, the criticality that emerged with regard to the implementation of the works was such as to lead to the property bankruptcy in 2016, resulting in a delay in the completion of the works.

Only in 2019, after the implementing party's bankruptcy declaration and on behalf of the new property, the ownership of the bankruptcy assets, including the areas within P.I.I. perimeter, was transferred to the new management company, thus allowing the reactivation of the transformation activities.

At present, within the area, the private buildings (figs. 8 and 9), as well as the primary urbanisation works connected to the mobility infrastructures, have been completed and already partially used (for a residential building quota of approx. 12,000 sqm and for a commercial function quota of approx. 2,500 sqm); the large urban park of approx. 30,000 sqm, as per the aforementioned obligation deed of 2014, is currently being completed and is expected to be opened and handed over to the city in 2022.

In designing the park particular attention was paid to the protection of the environment and the water system (through the re-use of groundwater), as well as to the creation of a new meeting place, aiming at maximising its use by citizens. The project, developed by the Fabio Nonis architectural studio and the Laura Gatti Studio (annex "5.3 Progetto Nuovo Parco"), aims to combine two themes: the historical memory of the area, and therefore its past linked to the presence of the station, and that of its future and the relationship

fig. 8
The privately owned buildings along Via Giovanni Cena, as seen from Viale Umbria, June 2020.
Source: Municipality of Milan

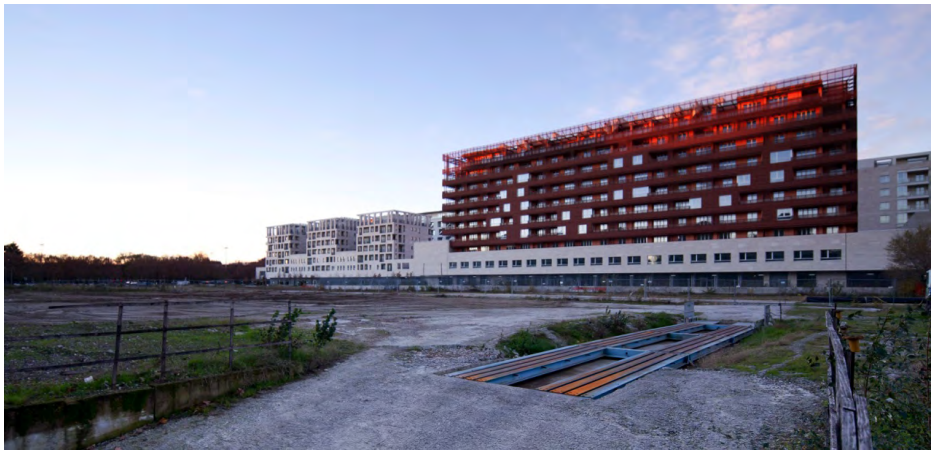


fig. 9
The privately owned buildings and the area in front of them that will house the new park, seen from Via Monte Ortigara, June 2020. Source: Municipality of Milan

that will be established with the *Nuova B.E.I.C.* and more generally with the neighbourhood and the expected urban transformations. For the conversion of the area into a public park, it was decided to use soil modelling, integrating different Nature Based Solutions (NBS): rainwater, for example, is intercepted by the grass surfaces and conveyed thanks to soil modelling in drainage trenches and rain gardens. Moreover, 400 new trees of 32 different species, 2,500 roses of different varieties, 5,000 shrubs and 15,000 perennials and grasses will be planted[2].
It should be noted that the Competition area, identified in detail in the paragraph "3.1 Intervention areas", with reference to the annex "5.6 Certificazione bonifica Porta Vittoria", has been reclaimed and certified according to the CSC reclamation objectives (Concentration Threshold Contamination - tabular objectives) of Table 1, Column A, Annex 5 to Title V of Part IV of Legislative Decree 152/2006 as amended, referring to sites to be used for green (public and private) and residential use. Reclamation operations began in October 2007 and were completed with the final inspection in April 2008.

2.3 RECENT AND ONGOING TRANSFORMATIONS IN THE NEIGHBOURHOOD

The areas adjacent to the Competition area, which are linked almost exclusively to a market past, have been affected by punctual refunctionalization interventions which have allowed to preserve the historical memory of the neighbourhood favouring at the same time the birth of important cultural realities and local services. The subject of these transformations are:

- Palazzina Liberty Dario Fo and Franca Rame (1992), which was the central bar of the former Fruit and Vegetable Market;

[2] The information is taken from the link: https://www.youtube.com/watch?v=bD5I-JcN8C3E

- Frigoriferi Milanesi (2009), as a former ice factory and refrigeration warehouses of the Gondrand Mangili company (Palazzo dei Frigoriferi) and former ice rink (Palazzo del Ghiaccio);
- Museum of Comics, Illustration and Animated Image (2010), in a building of the former confectionery factory of the Motta company.

The recent intervention in progress included in the Neighbourhoods Plan to renovate and expand the Calvairate Library is also part of this context.

Important transformations are expected in the next few years in the neighbourhood, such as the regeneration of the area of the former slaughterhouse in Viale Lombroso, which has been included in the Reinventing Cities programme, as well as the Palazzine Liberty in Viale Molise and the redevelopment of the Fruit and Vegetable Market.

• Palazzina Liberty Dario Fo e Franca Rame

It is the only remaining structure of the ancient Fruit and Vegetable Market, used as a bar-restaurant until 1965, when the market was transferred to its current location in Via Lombroso. After a period of abandonment, between 1974 and 1980 it was conceded to the theatrical collective "La Comune" by Dario Fo and Franca Rame (to whom Palazzina Liberty was named in 2017) and inside shows, parties, rallies and an acting school were held. In 1980 it became the seat of the Civica Banda di Milano and in the 1990s of the Civica Orchestra di Fiati di Milano and the Orchestra da Camera Milano Classica, in fact devoting itself to music.

Today it is configured as an auditorium which hosts numerous events, including concerts, shows, master classes, conferences and seminars, some of which are dedicated to the musical education of children[3].

• Frigoriferi Milanesi

The Frigoriferi Milanesi in Via Piranesi is a historic industrial complex in Milan, consisting of two buildings: Palazzo dei Frigoriferi and Palazzo del Ghiaccio. Palazzo dei Frigoriferi was built in 1899 as an ice factory and refrigeration warehouses of the Gondrand Mangili company. In 1923 it was joined by Palazzo del Ghiaccio, characterized by Art Nouveau architecture, which until 2002 housed the first ice skating rink in the city (the largest indoor rink in Europe) and sports events.

Throughout the first half of the 20th century, given its proximity to the Fruit and Vegetable Market and the Porta Vittoria station, ice was produced inside the Frigoriferi Milanesi and the food suppliers of the city were stored. In 1970 the complex was purchased by private owners, recovered and destined for different uses.

In the early 2000s it was decided to renovate the complex, which was converted into a multifunctional space, which houses professional

[3] For further information refer to the link: https://palazzinalibertyinmusica.it/

studios, organizations and associations operating in the fields of art and culture and promoting events open to the city. Palazzo del Ghiaccio, specifically, has become a location for fashion shows, exhibitions, conferences, fairs and business meetings[4].

• Museum of Comics, Illustration and Animated Image

The Museum is located in Via Campania, inside an important building for the neighbourhood it was founded in 1926 as an ATM depot (for the public transport system) and in 1960 the entire block was transformed into the Motta confectionery factory until its closure, starting a process of redevelopment of the block that led to the creation of a public garden and residential buildings instead of sheds. Only one building was maintained, recovered and entrusted to the Department of Culture of the Municipality of Milan, which in turn gave it in concession to the Franco Fossari Foundation in 2010, with its consequent transformation into a multifunctional space dedicated to comics. WOW Spazio Fumetto is so the centre dedicated to the so-called "Ninth Art" of the city, as well as a unique reality in Italy and of international standing. It is a hybrid space, which hosts exhibitions, cultural events, meetings and conferences, corporate or private events, screenings, workshops and courses that orient educational and aggregative experiences around comics. In addition, visitors can freely access the reading of approx. 9,000 publications of the WOW Library, a modern café and a well-stocked specialist bookshop[5].

• Calvairate Library

In the context of the Neighbourhoods Plan - "Plan of the local scale, of the city of yesterday and today in which we live, move, work, spend our free time" - there are interventions that aim to give life to an urban platform able to enhance the services that the Municipality of Milan offers to its citizens. In this framework, the expansion of the structure was started through the demolition of a part of the pre-existing building and its replacement with a new body. The intervention also includes the renovation of the building envelope and systems, the use of materials for energy containment and acoustic insulation, as well as the installation of photovoltaic panels[6].

• "Artepassante" project

It is a project of different Milanese artistic and educational cultural realities started in 2013, whose aim is to bring art, in all its forms, to a new and different audience from the one that usually frequents the "institutional" places of culture: in agreement with RFI, 17 disused

[4] For further information refer to the link: http://www.frigoriferimilanesi.it/it/
[5] For further information refer to the link: http://www.museowow.it/index
[6] For further information refer to the link: https://www.youtube.com/watch?-v=l93kATsyuDA

exhibition spaces have been redeveloped in the stations of the Passante Ferroviario - Villa Pizzone, Lancetti, Garibaldi, Repubblica, Porta Venezia, Dateo and Porta Vittoria - organising workshops, meetings, events and exhibitions[7].

• Ex Macello (Reinventing Cities – 2020/2021 edition)

The Ex Macello area, abandoned since 2005, has been included in the second edition of the Reinventing Cities programme, which has been promoted by the C40 Cities Climate Leadership Group and the Municipality of Milan. The programme objective is to promote an international competitive process – involving interdisciplinary and multi-role teams – aimed at developing urban regeneration projects based on the principles of environmental sustainability, carbon neutrality and resilience for the enhancement of publicly owned assets.

The winning project, called "ARIA", aims to develop a new district, which will stand out as one of the most important social housing projects in Europe, dedicated to the settlement of young people and families. More than 1,200 new flats are expected to be built, most of which will be rented at an agreed rates. Inside the district there will be the international campus of the European Institute of Design - IED (30,000 sqm and 4,500 students expected) and a student residence for 600 places inside the north pavilions. The recovery of historic buildings is one of the key elements of the project: hangars, galleries and warehouses will house new functions, services, offices, craft workshops, fab-labs, co-working learning spaces dedicated to professional start-ups and retail, together with the so-called "Air Factories", which will have the role of purifying the internal spaces, filtering atmospheric contaminants thanks to plants and soil: these spaces will act as meeting spaces for local associations and organisations.

In addition, the project aims at the development of the first Carbon Negative Area in Milan thanks to heating and cooling supply to the entire district that will be full electric and high efficiency through the innovative ectogrid technology and the photovoltaic of the Renewable Energy Communities which, producing more renewable electricity than that consumed by the district, is expected to subtract CO2 from the emissions budget of the rest of the city[8].

The project will also provide for the safety of the cycling network along Via Lombroso, which will be in a reserved location, thus completing the work started by the Administration, which has included it within the "Open Streets" initiative in 2019. The cycling network on the N-S axis of Viale Molise will be extended and stitched together with the

[7] For further information refer to the link: https://www.artepassante.it/

[8] For further information refer to the link: https://www.comune.milano.it/aree-tematiche/reinventing-cities/seconda-edizione/ex-macello

surrounding network. The focus will also be on the creation of the Porta Vittoria intermodal node with urban sharing systems, electric charging points and a dedicated fleet of electric vehicles.

• Palazzine Liberty
The six Palazzine Liberty in Viale Molise were part of the former slaughterhouse complex, which housed offices, concierge and residence of the rationing town. Being in a state of under-use they had been included in the second edition of Reinventing Cities programme. Since no project proposals have been submitted for their redevelopment, the Municipality of Milan is evaluating possible alternative procedures.

• Nuovo Ortomercato
The agri-food market of the city (fruit and vegetables, fish, flowers and meat), located in Via Lombroso and managed by SoGeMi, will be affected over the next few years by a series of interventions, including the construction of a new more modern Fruit and Vegetable Pavilion and a new dedicated Logistics Platform, as well as the redevelopment of Palazzo Affari, which will become a pole for both Italian and foreign companies and professionals, operating in the supply chain. The project, called “Foody 2025”, aims to transform the Ortomercato into the most important Italian agri-food HUB capable of competing with the main European agri-food markets.

2.4 ACCESSIBILITY

The Competition area has an excellent accessibility, due to the presence of the Porta Vittoria station of the Passante Ferroviario (with accesses from Via Cervignano and Viale Molise). The Passante connects the area not only to the city centre and the Milanese hinterland, but also to the high-speed railway stations (Milan - Rogoredo and Milan - Porta Garibaldi stations), as well as the Dateo station - one Passante Ferroviario stop away from Porta Vittoria - which will be connected by the M4 metro line in a few minutes to Linate Airport.
Cycling mobility is encouraged by the presence of reserved cycle lanes along Via Cervignano and Viale Molise.
From the point of view of vehicular mobility, the site is easily accessible thanks to its proximity to the outer ring road (Viale Umbria), Viale Molise and the Corsica-Enrico Forlanini avenues, which provide easy access to the A51 east bypass.

2.4.1 ROAD NETWORK

The classification of the roads delimiting the Competition area - Via Cervignano, Via Monte Ortigara and Viale Molise - 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 roads; E - Urban district roads; E-bis - Urban cycle routes; F - Local roads; F-bis - Cycle/pedestrian routes. In compliance with the indications contained in the above-mentioned 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 in the Functional and geometric 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 indicated 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 High-speed urban road
Main network	Main extra-urban roads	High-speed urban road 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 streets

In particular, in Ordinance no. 334 of 10/03/2021[9] (fig. 10), the roads delimiting the Competition area were classified as follows:

- urban inter-district road, i.e. an intermediate road between high-speed roads and district roads (E and F - roads bordering the avenues), Viale Molise;
- local urban street (F), Via Monte Ortigara and Via Cervignano.

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

District roads generally correspond to the access routes to the central sectors of the city and to the trolleybus circle. In accordance

[9] See the link: https://www.comune.milano.it/documents/20126/3813098/Ordinanza+n.+334_2021+del+10.03.2021.pdf/f33bc077-f5bf-7549-b29a-604b094aaeb7?t=1625730774476

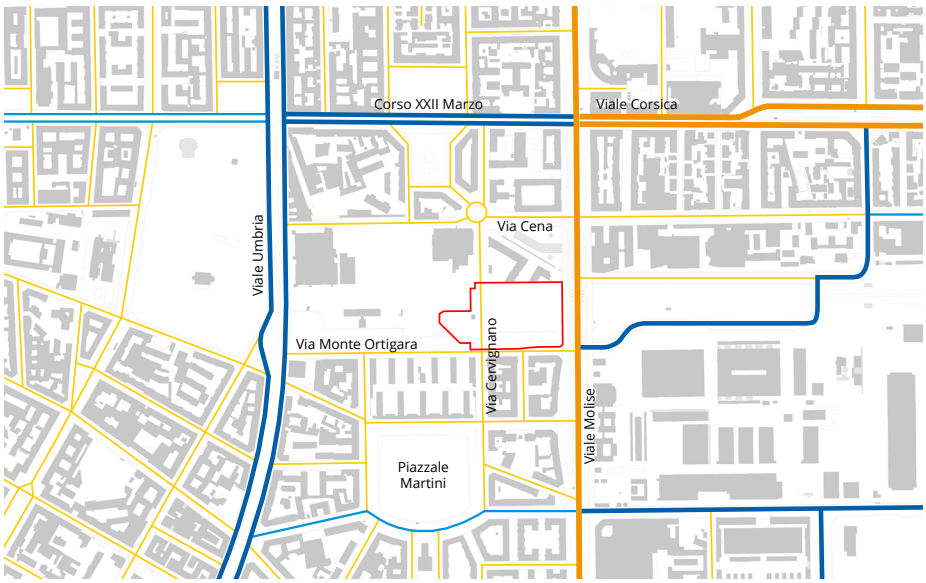


fig. 10
Diagram of the road network accoding to Ordinance no. 334 of 10/03/2021 showing the road classification and the built-up area limit.

Legend
- Competition area
- main network (inter-district)
- secondary network (district)
- secondary network (local inter-zonal)
- local network

with 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, a 0.50 m right-hand bank, 1.50 m pavement, 12 m relevance zones and 10 m buffer zones. For the other main characteristics, a minimum planimetric radius of 51 m, a maximum transversal slope in curves of 3.5%, a maximum longitudinal slope of 8% are determined. A design speed of 40 to 60 km/h is set.

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

The accessibility to the primary network is guaranteed by the connection to the east ring road A51 (exit no. 6 - Linate Airport - Viale Forlanini) through the main inter-district network of Viale Molise and Viale Corsica.

2.4.2 PARKING AREAS

The area concerned by the Competition falls within Parking Area no. 17, with a charge of 2 €/h on weekdays, from 8 a.m. to 7 p.m. Residents are allowed to park free of charge.

The area is bordered by two other parking areas (no. 15 and no. 16) belonging to the same circle of trolleybuses as Area no. 17, and by Area no. 31 which, belonging to the non-trolleybuses circle, has a charge of 1,20 €/h only in the morning (8 a.m. to 1 p.m.) on weekdays

(Monday - Friday). At present, Area no. 31 is still in the process of being completed with regard to the conversion from free to paid parking.
The area is characterised by a high demand for parking both during the day and at night (Demand Index > 1). In this regard, we point out the massive occupation of the central parterre in Viale Umbria, where vehicles park irregularly. This occupation is already destined to find a different location in the medium term, since the parterre is currently being studied for its redevelopment with a ban on vehicles.
The ground level car parks currently present along Via Monte Ortigara, built provisionally in order to meet the needs expressed by the Municipal Council in relation to the difficulties for residents in the neighbourhood in finding parking areas, will be reallocated within the intervention area in the Porta Vittoria P.I.I.

2.4.3 PUBLIC TRANSPORT SYSTEM

The Competition area is located in a strategic position with respect to the public transport system of the City of Milan.
The Porta Vittoria station of the Passante Ferroviario is located within the Competition area and the following suburban railway lines run: S1 (Saronno - Milano Passante - Lodi), S2 (Mariano Comense - Milano Passante - Milano Rogoredo), S5 (Varese - Milano Passante - Treviglio), S6 (Novara - Milano Passante - Treviglio), S12 (Melegnano - Milano Passante - Cormano) and S13 (Pavia - Milano Passante - Milano Bovisa). This system is connected to the metro lines, including the forthcoming new M4 line, which will intersect the suburban railway lines at Dateo station, just one Passante stop away from Porta Vittoria station (fig. 11).
From Porta Vittoria station the suburban lines running there have the following operating schedule:

- arriving from Rho and Segrate, the S5 (Varese - Treviglio) and S6 (Novara - Treviglio) lines have a peak frequency of about 15’ with a service time of 5:13 - 22:43 and 5:18 - 23: 18 r espectively;
- arriving from Bovisa, the S1 (Saronno - Lodi), S2 (Mariano Comense - Milano Rogoredo), S12 (Melegnano - Cormano), S13 (Pavia - Milano Bovisa) lines have a peak frequency of 10’ with the following service time: S1 5:53 - 22:53, S2 5:40 - 21:24, S12 4:44 - 23:52 and S13 5:39 - 22:39.

The area is served within a radius of approx. 500 m by the following LPT lines (fig. 12):

- no. 2 4900 model trams, such as the no. 12 (V.le Molise - Roserio) and the no. 27 (V.le Ungheria - P.za Fontana) with a seating capacity of 196 passengers and a peak frequency of 8’ and 10’ respectively;
- no. 3 12-metre buses, such as line no. 62 (P.le Sire Raul - P.ta

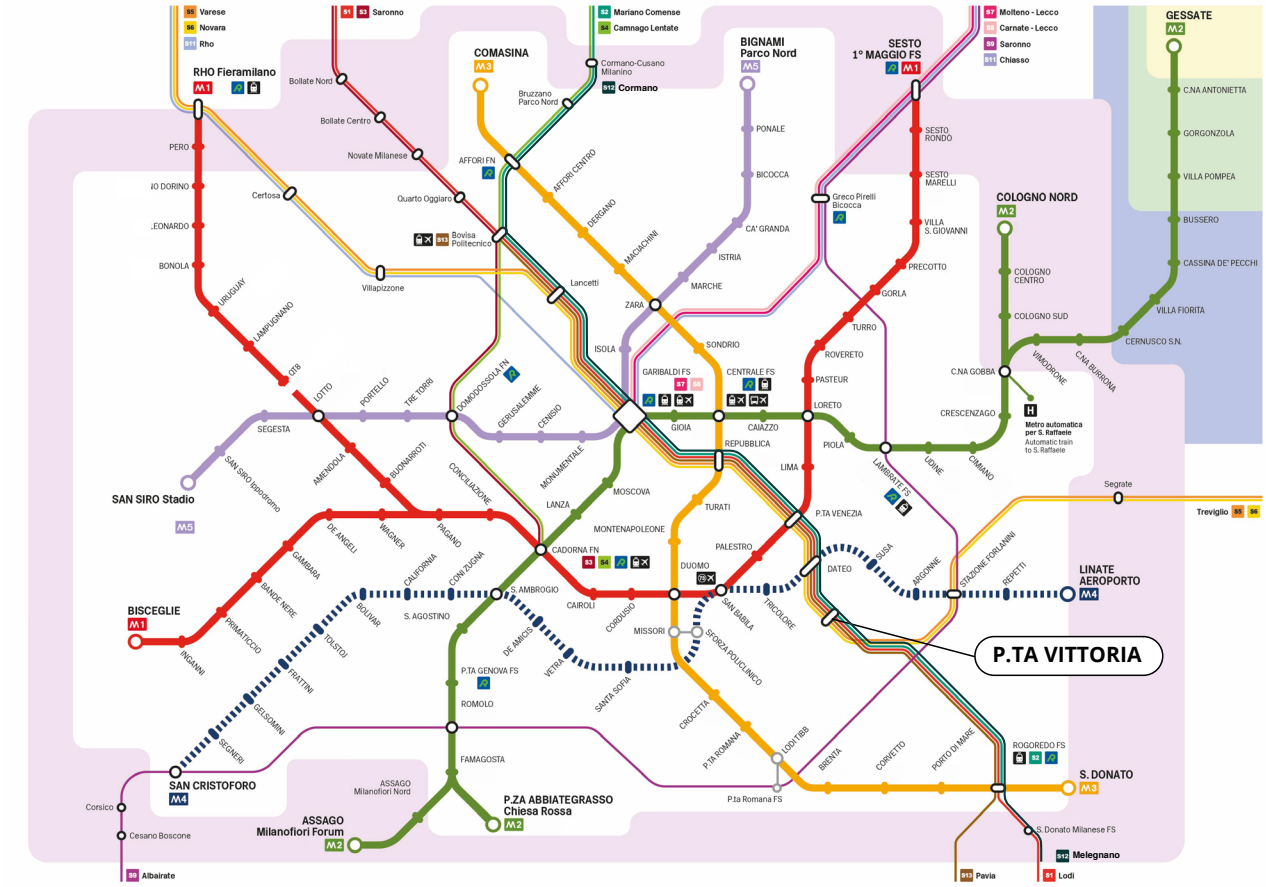


fig. 11
The Passante Ferroviario lines that pass through the Porta Vittoria station and the metro lines.

Romana), line no. 66 (Peschiera Borromeo - Via Cadore) and line no. 84 (San Donato M3 - L.go Augusto), with a capacity of 70 seats and a peak frequency of 8'/9' for line no. 62, 10' for line no. 66 and 12'/13' for line no. 84;

- no. 1 18-metre bus, such as line no. 73 (Linate Airport - Duomo), with 125 seats and a peak frequency of 10 minutes;
- no. 2 18-metre trolleybuses with a capacity of 135 seats, such as the right and left circular lines no. 90-91 (Isonzo - Lotto) and line no. 92 (Viale Omero - Lambrate), with a peak frequency of 3'/4' and 4'/5' respectively;
- no. 1 12-metre trolleybus with 80 seats offered by line no. 93 (Viale Omero - Lambrate) with a peak frequency of 4'.

The Urban Sustainable Mobility Plan (P.U.M.S.) of the Municipality of Milan envisages that the Porta Vittoria station of the Passante will serve no. 8 S lines with an offer of 16 trains per hour in each direction and an average of no. 1 train every 3'45" in the Lancetti - Porta Vittoria urban section. Another new feature envisaged by the P.U.M.S. is the change in the route of the no. 92 line, which from Lodi to Loreto will be moved to the outer route, currently served by the no. 90/91 line. In turn, the left and right circulars will be routed on the no. 92 line route.

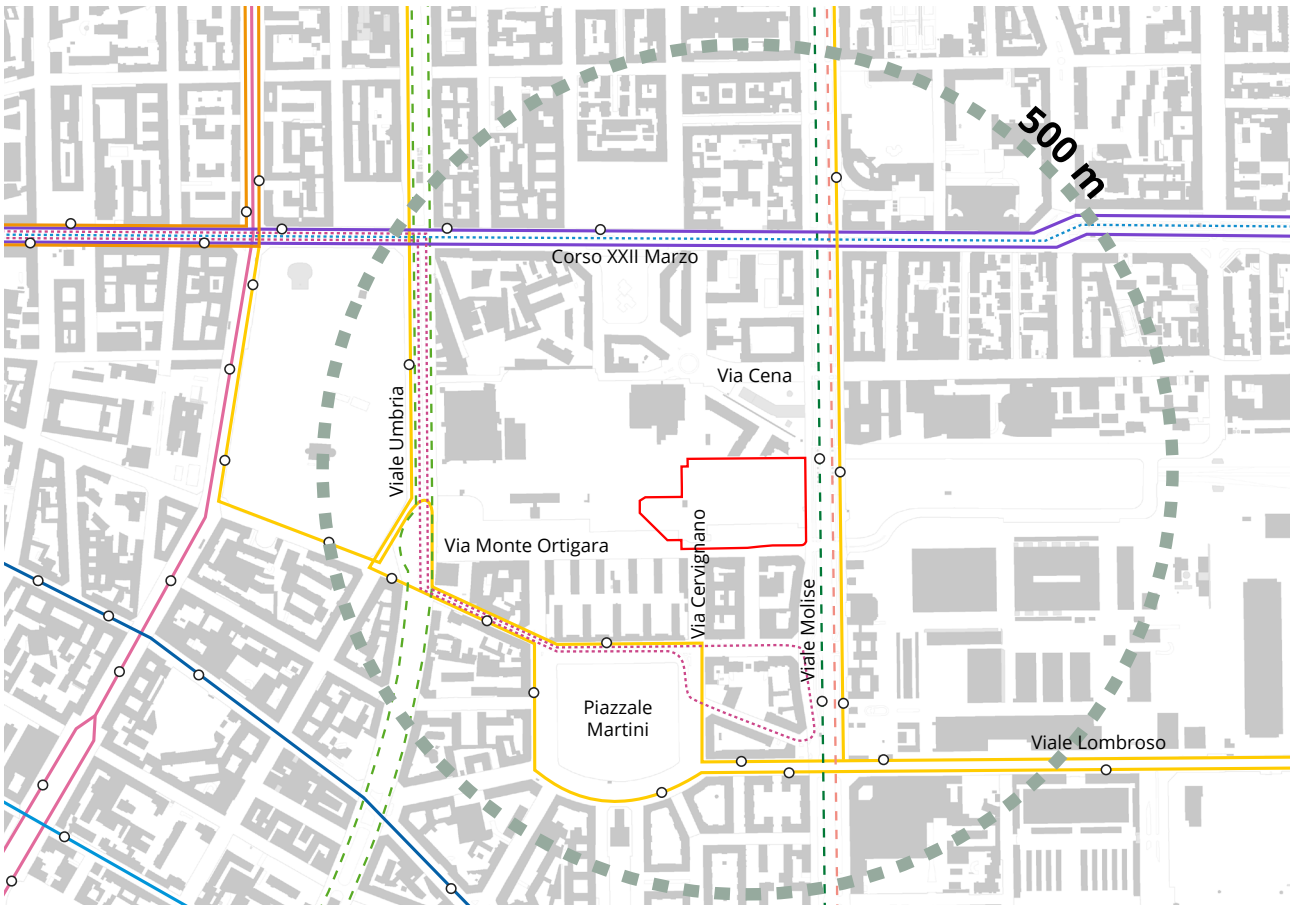


fig. 12
The LPT lines
in Porta Vittoria.

Legend
Competition area
tram 12
tram 27
bus 60
bus 62
bus 66
bus 73
bus 84
trolleybus 90-91
trolleybus 92
trolleybus 93

The Programme for Local Public Transport Services of the Bacino di Milano, Monza and Brianza, Lodi e Pavia reiterates the provisions of the P.U.M.S. regarding the changes to the no. 90/91 and no. 92 trolleybuses, and in addition evaluates the possibility of swapping the routes of lines no. 66 (Peschiera Borromeo - Via Cadore) and no. 45 (San Donato M3 - Lambrate FS M2) on Via Zama and Via Salomone. Once the load estimates and the feasibility of the routes have been worked out, the route of line no. 66 could be diverted to V.le Molise, Stazione Porta Vittoria and Via Monte Ortigara, where the *Nuova B.E.I.C.* is expected.

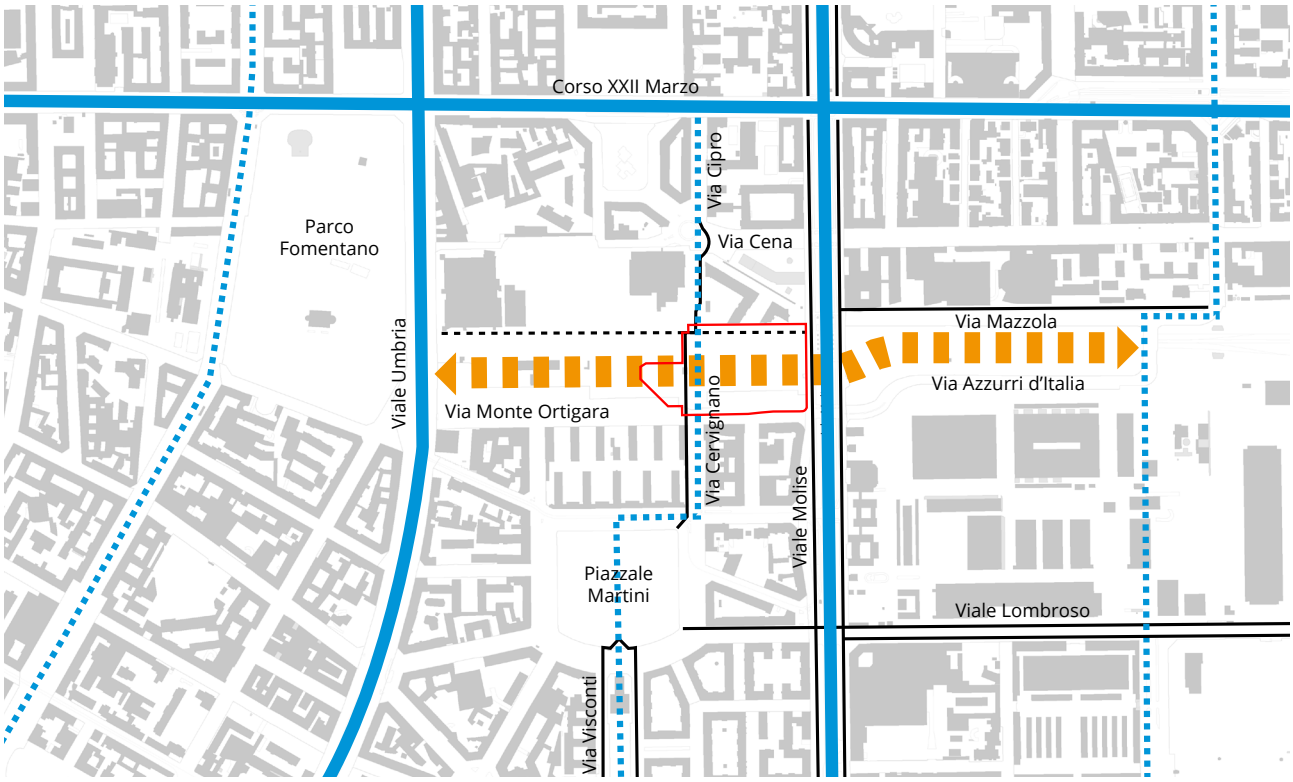
2.4.4 CYCLING NETWORK

In order to promote effective active mobility, one of the Administration's priority actions is the creation of a system of main and secondary cycle routes for systematic movement between the various urban centres and connection with the surroundings. The network of routes is complemented by widespread cycling measures and moderate speed zones for safe and liveable mobility at the neighbourhood level.

The objective, in line with the P.U.M.S., is to create conditions of safety, liveability and quality of public space, intended as a “common good”, guaranteeing system effectiveness conditions.
Particular attention will have to be paid to the crossings that will allow pedestrians and cyclists to safely cross the intersections and reach all directions.
The Porta Vittoria area is located between two main north-south cycle routes, i.e. the inner circle of Viale Umbria and Viale Molise. The secondary routes involve, on the one hand, Piazzale Martini and Via Cervignano and, on the other, the new connection planned within the Reinventing Cities project area of the former slaughterhouse, in continuity with Via Vismara.
The Porta Vittoria area assumes, therefore, a fundamental role for the east-west connection between the different cycle routes identified (fig. 13). The main cycle routes are intercepted by the existing cycling network in:

- Via Cervignano: a two-way promiscuous pedestrian and cycle path that currently connects Via Cipro to Emilio Alessandrini Park, passing through Piazzale Ferdinando Martini;
- section of Viale Molise between Viale Corsica and Via Caposile: one-way cycle paths in each direction. These cycle routes are to be extended in a north-south direction (currently these routes continue in the road bordering the avenue, in the 30 km/h speed restriction zone);
- Viale Lombroso: connection between Piazzale Martini and Piazza Ovidio.

fig. 13
Main and secondary cycle routes in the neighbourhood.



Within the Competition area, along the northern boundary, there is a strip of approx. 600 sqm, with a width of approx. 5 m, in which a cycle/pedestrian path was planned, as part of the urbanisation of the Porta Vittoria P.I.I., in charge of private property, but was never built. The strip has been included in the Competition perimeter, as specified in paragraphs “3.1 Intervention areas” and “3.2 Buffer zones and distances from boundaries”.

The construction of this path is of fundamental importance for the connection of the two large areas undergoing transformation. In this perspective, in addition to the works foreseen by the Reinventing Cities project, such as the redevelopment of the Via Lombroso route and the extension of the North-South cycling network along Viale Molise, it is necessary to connect and give continuity to the cycle path along Via Valentino Mazzola, part of the planned cycle route that will connect the area with Forlanini Station. In order to increase the functionality of the cycle and pedestrian connections, it is therefore considered necessary to resolve and adapt two connection nodes between the Porta Vittoria and Ex Macello areas (fig. 14):

1. requalify the existing intersection between Via Valentino Mazzola and Viale Molise, providing a bidirectional cycle crossing accessible from both directions of Viale Molise;
2. requalify the existing intersection between Via Azzurri d’Italia and Viale Molise, providing cycle crossings that guarantee cyclists all turns; in particular, bicycle access to the future B.E.I.C. area to the east must be guaranteed, while access in both directions to the area must be guaranteed to the west.

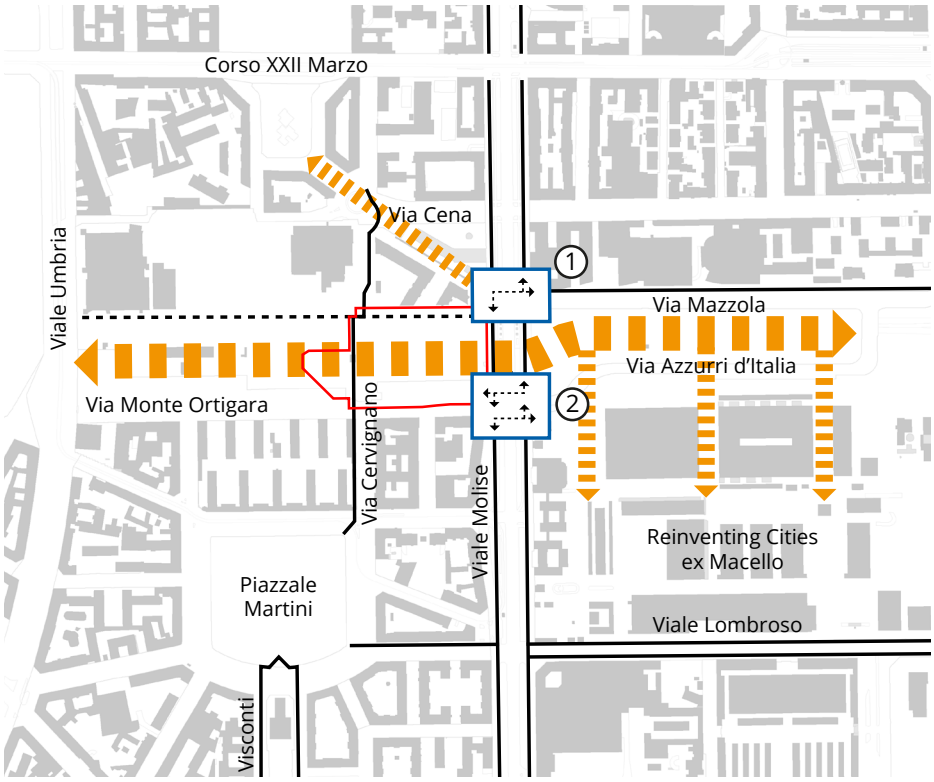


fig. 14
Connection nodes to be resolved and adapted.

PUMS Metropolitan City of Milan

The P.U.M.S. of the Metropolitan City of Milan reinforces the concept of cycling as the most widespread and "intuitive" form of sustainable mobility, and confirms the centrality of this theme by providing the Biciplan ("Cambio"). In continuity with the Milan P.U.M.S., it designs a system of routes connecting the city.

In particular, in the guidelines of "Cambio", an itinerary (no. 6) is foreseen that borders the area in question with two routes that connect the circle of Bastioni with Peschiera Borromeo/Segrate passing on one side along Corso di Porta Vittoria - Corso XXII Marzo - Viale Corsica - Viale Forlanini (route 6 XXI Marzo-Forlanini) and on the other along Via Anfossi - Piazzale Martini - Via Lombroso - Via Mecenate (route 7 Besana-Mecenate).

These two radials intersect the priority network of the P.U.M.S. making a dense network around the area, subject of this Competition.

Finally, it should be noted that within a radius of 500 m from the Competition area there are two "BikeMi" stations, i.e. the bike sharing service of the Municipality of Milan (fig. 15):

- in Via Apulejo, at the intersection with Viale Campania;
- in Via Laura Ciceri Visconti, near Piazzale Martini and the Calvairate library.

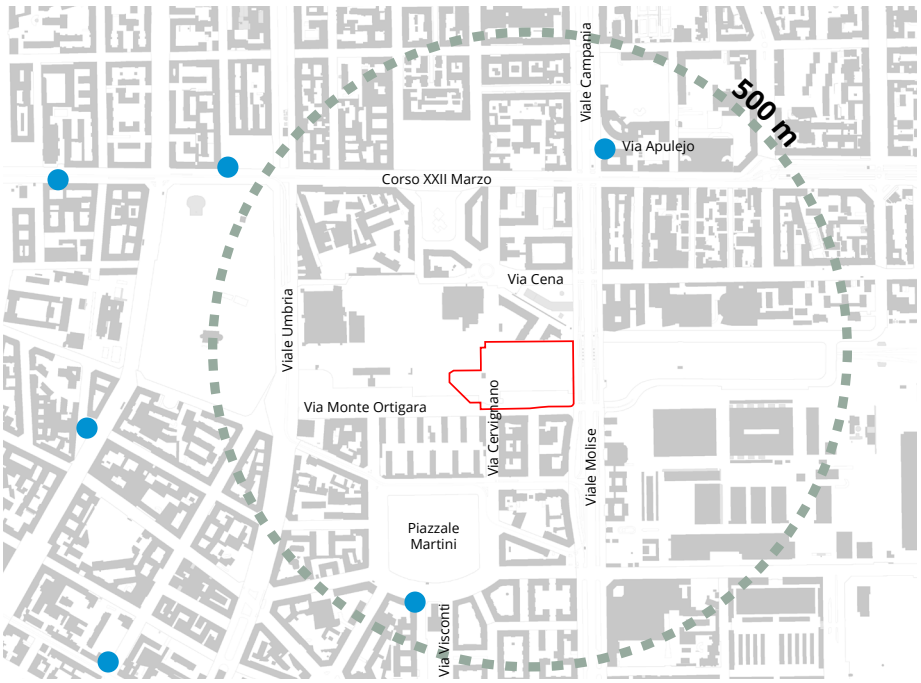


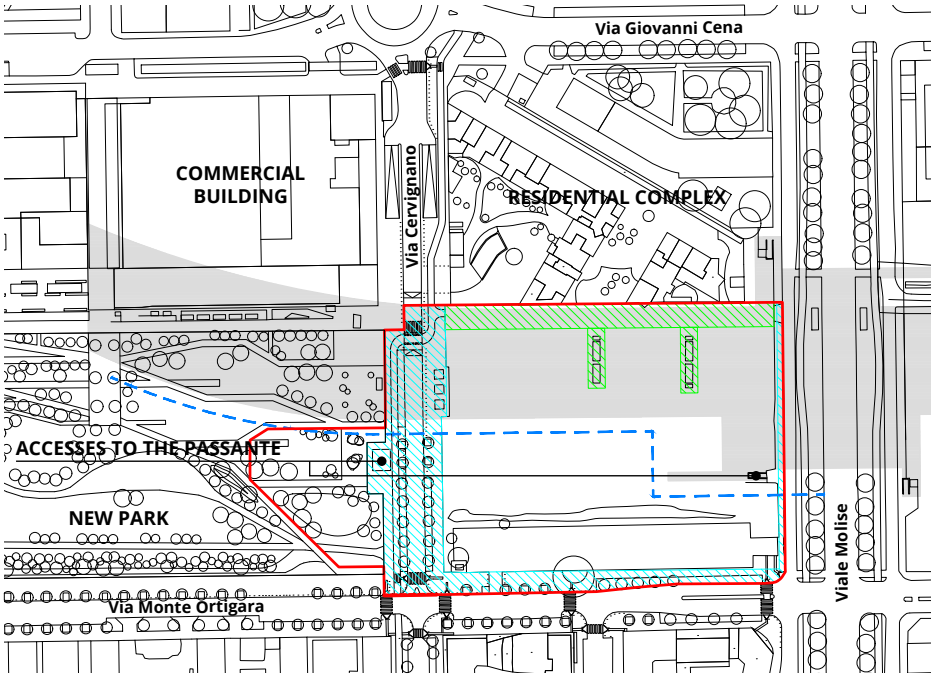
fig. 15
Map of BikeMi stations.

chapter 3 SUBJECT OF THE COMPETITION

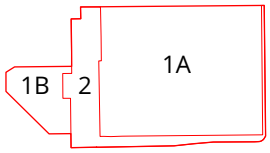
3.1 INTERVENTION AREAS

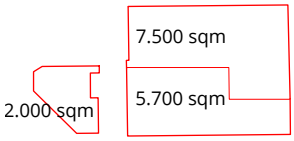
The Competition area (fig. 16), for which a technical and economic feasibility project is required, is defined in the annex "3.2 Board with the perimeter of the Competition area".

fig. 16
Perimeter of the Competition area.



Legend
- perimeter of the technical and economic feasibility project
- recently completed works
- unbuildable area
- boundary of the Passante Ferroviario
- area occupied by the Passante Ferroviario





This area is located at the former Porta Vittoria railway yard and is divided into two areas within the red perimeter:

- **Area 1** consists of two sub-areas separated by Via Cervignano:
  - **Sub-area 1A** (area of approx. 13,200 m^2) borders on the east with Viale Molise, on the south with Via Monte Ortigara, on the west with Via Cervignano on the north with a residential complex. As part of this area, a project is requested for the construction of the *Nuova B.E.I.C.* Given the presence of the Passante tunnel, it is allowed to design underground parts of the building only in the southernmost part of the area on a total surface of 5,700 m^2, following the indications reported in paragraph 3.3.
    Participants are also required to design the street furniture and the surface arrangement of the areas outside the *Nuova B.E.I.C.* (including furniture and lighting).
    Furthermore, participants are required to design the interior fittings and furnishings of the new library.
  - **Sub-area 1B** (area of approx. 2,000 m^2), corresponding to a part of the park currently under construction, located west of Via Cervignano. In line with what has already been achieved

in the park, the provision of an additional library building and a connection (possibly aerial, in compliance with existing constraints) between the park and sub-area 1A is not excluded.

- **Area 2** (area of approx. 3,800 m2), containing recently completed works, such as the section of Via Cervignano between the access to the residential complex and the intersection with Via Monte Ortigara and the pavements along Viale Molise and Via Monte Ortigara. Given the recent construction of Via Cervignano, participants are asked to evaluate a redevelopment of its surface - also considering its pedestrianisation - and its transformation into a quality public space, able to integrate the park with the new library. Any choice, in this sense, will have to consider the existing accesses (parking ramps of the commercial structure, maintenance accesses to the park and public spaces, accesses to the Passante Ferroviario, etc.). As stated in paragraph 3.7, the existing trees must be preserved, and the amount of greenery and soil permeability must be increased. The space in Via Cervignano should be configured not so much as a place of passage, but as a meeting and socialising place, safe and easily accessible, an integral part of the library. This space should remain unbuilt and the cycle and pedestrian permeability and the north-south connection between Via Giovanni Cena and Via Monte Ortigara should be guaranteed.

The participants shall evaluate the realisation of the project in different time phases and areas (Area 1 and Area 2), concerning the different functional uses of the Competition areas, like the different forms, timing, and modalities of relative financing. Area 1 is to be considered a priority about the constraints on financing.

3.2 BUFFER ZONES AND DISTANCES FROM BOUNDARIES

As stated in sub-paragraph 2.4.1, the main roads adjacent to the Competition area, according to Ord. no. 334 of 10/03/2021, are classified as follows:

- Via Cervignano (local road - F)
- Via Monte Ortigara (local road - F)
- Viale Molise (urban inter-district roads - E)

With regard to the buffer zones provided for constructions in residential areas, please refer to Art. 28, subsection 2, of Presidential Decree no. 495/1992: *"With regard to type E and F roads, in the cases referred to in subsection 1, no minimum distances from the road boundaries are established for the purposes of traffic safety"*.

Regarding the distances from boundaries, please refer to the following normative references as well as to the broader sector regulation:

- Ministerial Decree no. 1444/1968 (with regard to the minimum distance of 10 m between windowed walls and the opposite building walls);
- Building Regulation of the Municipality of Milan (Art. 86).

In particular, please refer to Art. 86, which states as follows:

"1. In every new building intervention [...], the distance of the building from the border of contiguous funds of other property cannot be inferior [...] to 5 m [...], measured by the edge of the facade or the projecting balconies. Below that distance, buildings are allowed provided that the consent of the neighbouring property is proved by a registered and transcribed act, to be produced along with the presentation of the certificate, without prejudice to the mandatory minimum distance of 10 m between windowed fronts. The minimum distance from the boundaries referred to in this subsection is set at half the mandatory minimum distance minima borrowed from Ministerial Decree no. 1444/1968, and will therefore always apply with this ratio, in accordance with any subsequent higher-level, derogatory or substitute legislative provision.

3. [...] In every new building intervention [...] the distance of at least 10 m between windowed walls and the opposite building walls is always mandatory [...]; in the presence of projecting balconies, this distance is measured from their outer edge. This distance is assumed perpendicular to the front.

4. Notwithstanding the minimum distance of 10 m in the cases referred to in the previous subsection 3, in all cases of a new building [...], interventions must also be designed in such a way as to ensure adequate sunlight conditions for existing buildings. To this end, if the new volumes are in front of an existing window facade, regardless of the intended use of the opposite building, the following graphic verification must be satisfied: a half-line drawn in the perpendicular plane to the facade of the existing building, in correspondence with the axis of the view placed in the lowest position and inclined by 60° on the horizontal plane of the floor of the room in which the view is located, starting from the intersection between said room and the external wall of the building, must be outside the physical encumbrance of the new volumes. [...]

5. Buildings facing public spaces must comply with the condition referred to in subsection 4, as long as this does not conflict with the proper insertion of the building in the built environment and the surrounding public spaces. [...]

7. The mandatory minimum distance referred to in this article [...] is borrowed from the Ministerial Decree no. 1444/1968 and therefore should be applied in accordance with any subsequent higher-level, derogatory or substitute legislative provision".

At the border with the residential complex, north of sub-area 1A, there is a 5 m wide strip, of about 600 m^2, of private property, upon

fig. 17
The two Passante Ferroviario grids within the Competition area.

which an easement for public use has been identified. The realization of a cycle path was envisaged in this segment, as also indicated in the P.U.M.S. This area should not be built on nor planted with trees, and the intended functional purpose should be maintained inserting the cycle path in the articulation of the public space.
Within this area, an access to the Passante Ferroviario grids (fig. 17) by vehicles equipped with cranes for maintenance operations may coexist: participants are invited to evaluate the possibility of keeping the space between the two grids free and devoid of buildings, transforming it into a public space accessible both by the users of the library, and by the inhabitants of the neighbourhood and more generally by the citizens.
Along the perimeter of the Passante Ferroviario ventilation grids a strip of 2 m must be considered not buildable nor plantable.
The ventilation grids should be accessible from above, in order to allow the lowering of any materials inside the Passante Ferroviario structures; a free area should be maintained to allow maintenance operations. The structure of the *Nuova B.E.I.C.* should also not reduce the ventilation volumes currently provided by the grids.

3.3 REQUIREMENTS FOR THE CONSTRUCTION OF NEW BUILDINGS INTERFERING WITH THE UNDERGROUND STRUCTURES OF THE PASSANTE FERROVIARIO

For the use of portions of soil and/or subsoil adjacent to or overlying the Passante Ferroviario structures and which are statically interfering with those of the Passante, it is necessary to take note of the following requirements.

In the subsequent design levels, the position of the underground railway structures should be confirmed by surveying at least the parts emerging above ground.

• General requirements for structural aspects

- New constructions must be independent from the existing railway structures, since there cannot be any element of structural continuity between them.
- New constructions, both in the transitory phases of excavations and after work completion, must not induce temporary or permanent overvoltage regimes in the existing structures or otherwise alter their static behaviour in such a way as to reduce entirely or partially their intrinsic degree of structural safety.
- The design of the new works to be carried out must minimize the displacements induced on the railway structures, with particular reference to subsidences due to the loads of the new buildings and to the horizontal displacements due to the variation of the thrust regime. Movements, even if minimal, can in fact induce exceeding of the tolerance limits of the bends and flexes of the tracks in function.
- In order to avoid subsidence phenomena, as a rule, any temporary or permanent groundwater pumping in the proximity of the railway structures is excluded. In this regard, the water table values assumed in the design phase for the artificial tunnel and station are the following:
  - March 1999 water table: 102.00 m a.s.l.
  - Reference water table[10]: 104,50 m a.s.l.
  - Design water table[11]: 111,00 m a.s.l.
- Recent readings of the piezometers available in the area (February 2022), compared to the date of drafting these notes, place the groundwater level at an altitude of 130.91 m a.s.l. (depth 11.69 m from ground level, reading of September 2021, piezometer M55 located in Viale Piceno about 500 m north of the station). For full disclosure, it is noted that the maximum value in the last 35 years occurred in December 2014 with a groundwater level of 104.93 m a. s. l. (depth 10.67 m) consistent with the reference groundwater level assumed in the project, while the absolute maximum value occurred in 1954 with a level of 107.50 m a.s.l.

• Interferences with open-air works

Open-air works are those works for the execution of which excavations have been carried out by directly excavating the ground,

[10] The reference water table is the water table level considered during construction phases, for the sizing of the bottom buffers and bulkheads, when they have the temporary function of supporting excavation.

[11] Design water table means the water table level assumed for sizing works in final service conditions.

adequately profiling the slope of the walls in order to ensure self-support, or by using provisional support works such as metal sheet piles, pile bulkheads or diaphragms, equipped or not with one or more rows of struts or tie rods.
In the specific case of the Passante Ferroviario (see annex "5.6 Stazione Porta Vittoria") both the Porta Vittoria station and the entrance tunnel coming from the Dateo station, precisely starting from the progressive kilometre 4+397,344 near Via Giovanni Cena, were built between diaphragm walls with tie rods. The tie rods were, however, conceived as provisional and therefore have now completed their function.

• Particular requirements concerning structural aspects

Excavation and earthworks

- From the topographical reference plan, generally coinciding with the current ground level, lateral excavations are normally allowed up to 5 m deep, at a minimum distance of 1.5 m from the outer edge of the bulkheads if present, or from the outer edge of the pier foundation.
- Any other more onerous situations in terms of excavation depth or distance from the structure will be taken into consideration on the basis of a detailed design of the excavation work; excavations adjacent to railway structures must be planned at such a distance and/or with precautions that guarantee against the occurrence of unacceptable horizontal loads or dissymmetrical thrusts; in any case, it will not be allowed to lay bare the bulkhead or the structure pier.
- During the execution of excavations, any tie rods intended to support the protective excavation diaphragms must not interfere with the existing structures, but may be placed at a suitable distance below it, without interfering with the bulkheads.
- Any tie-rods on the existing railway structures are in any case to be considered entirely temporary, and any release during the execution of excavation must be carried out in such a way as not to damage or unbalance the structures themselves.

New definitive works

Only new constructions can be built on the sides of the railway building; they will have direct slab or discontinuous foundations and will be allowed if placed at a distance from the outer face of the building not less than those indicated in the previous point; furthermore, the pressures transmitted to the ground will be compatible with those assumed as the basis for dimensioning the building structures, normally equal to the existing geostatic load, with reference to the ground level, increased by the 1st category

road load.

Specifically, the definitive structures of the artificial tunnel at the entrance to the Porta Vittoria station, consisting of reinforced concrete box culverts, have been designed for an overload in the roof f, in addition to its own weight, of 70 kN/m^2 including both the soil covering and the variable operating overloads.

Similarly, the roof slab of the Porta Vittoria station was designed for an overload of 70 kN/m^2, including both the soil covering and the variable operating overloads, while the slab portion between alignments 42-45 was sized for a category 1A road type overload, in accordance with the regulations of the time (D.M. of 04/05/1990 and relative instructions issued by the Superior Council of Public Works with Circular no. 34233 of 25/02/1991 "General criteria and technical prescriptions for the design, execution and testing of bridges"). It should be noted, however, that the slab portion between alignments 42-45 does not fall within the Competition areas.

Regarding the station retaining walls, the horizontal thrust due to the operating overloads has been evaluated in active thrust regime starting from a surface overload intensity of 20 kN/m^2.

- New constructions with higher load levels will be allowed if they are foreseen with deep foundations such as not to induce further vertical stresses and therefore further failures in the railway structures, both for the lateral friction effects in the close flanking areas, and for the possible interferences with the foundation bulb at the foot of the diaphragms.

• Further requirements regarding the execution of new works

- Works for new buildings or for maintenance on the surface or underground that may create interference with the Passante Ferroviario structures must refer in advance to the current D.P.R. 753/1980, taking into consideration the possibility of going in derogation from Art. 49 of D.P.R. 753/1980 provisions, pursuant to Art. 60 of the same D.P.R.;
- The exercise of the domination above or adjacent to the structures shall be limited in such a way that it does not have to create a hazard or to cause damage or prejudice of any kind sorts to the structures and to the regularity of operations, causing slowdowns or interruptions. In other words, appropriate measures and technical solutions must be taken and documented in order to adequately separate the reciprocal influences between the new building and the railway transport structure and in particular:
  - in the subsequent design phases, the project must include an accurate forecast analysis of the displacements induced on the railway structures; it must also include a monitoring plan that allows for the verification of the project assumptions

during the construction: this monitoring plan must indicate the parameters to be acquired, the description and positioning of the instrumentation, the time frame of the readings in relation to the construction phases of the works, the relative values of attention and alarm thresholds;
- it is forbidden to build storage facilities of flammable materials in the immediate proximity;
- in the event of fire, all RFI facilities shall be safeguarded;
- it shall be ensured that technological rooms, garages or other facilities are adequately segregated from the railway line structures, and that fires, fumes or water pipe leaks do not propagate to the railway line spaces;
- the propagation in the new constructions of vibrations or noises induced by the functioning of the railway line must be limited by the promoter: any situation of disturbance cannot in any way be attributed to RFI;
- the access, integrity and functionality of any secondary structures, including emerging ones, already prepared for normal or particular technical maintenance and/or service purposes of the line (emergency exit) must be guaranteed; this kind of structures, possibly equipped with grids, must always be reachable and usable independently, always guaranteeing the lowering of elements for the equipment maintenance inside the Passante Ferroviario; it must also be ensured that above them there is no passage, stopping or parking of vehicles, even temporarily laying of objects and materials which entails the risk of spilling liquids or other dangerous substances inside;
- access to escape routes and emergency accesses to the railway line must be guaranteed, even in the case of seismic events affecting the structures of new buildings;
- work around buildings must be carried out taking care to maintain the waterproofing and its protection intact.

The projects of new works interfering with the RFI buffer area must possess, for the final and executive phases on which the aforementioned company must express its opinion, the following information, details, drawings, references etc.:

- plan and longitudinal section of the new works highlighting tracks and identifying civil works (bridges, tunnels, etc.) constituting the railway line;
- geological, geotechnical and seismic characterization (soils, consistency, height of water table and its oscillations);
- the cartouches must bear: references to the railway line, with progressions of the interference, municipality of belonging;
- graphic overview board with names of lines, pk, buildings, neighbouring railway structures that may be present;

- overview board of the sub-services (water, sewage, gas, telephone, electricity lines) owned by RFI SpA, within a radius of 50 m from the interfered area;
- a detailed board of the surface water drainage network coming from the new work (existing water network, rainwater collection and drainage network, any interferences with existing channels, tunnels, manholes);
- all the plan and section boards must include: existing tracks, any future tracks, line toponymy, manholes, pipes, ditches, type and measures of guardrails, fences and waterproofing in the case of underground passageways, horizontal and vertical distances from the railway plan, distances from the live conductor, distance from the nearest civil work face constituting the railway line (bridges, tunnels, etc.);
- boards with the plan of the construction site and material storage areas;
- cadastral plan boards;
- boards with plans of excavation plan with distances from the nearest rail and civil works face forming the railway line (bridges, tunnels, etc.).
- in general, where applicable, evidence must be provided that the project complies with the RFI DTC SI MA IFS 001 E Civil Works Design Manual, Part II - Section 3 Road Structure, 3.10 Supporting structures, 3.12 Interference. The Manual can be requested directly from RFI.

3.4 ASPECTS OF VIBROACOUSTICS

From the feasibility and preliminary phases, the designer will have to consider the need to contain within tolerability limits, for the whole building and any annexed parts, the acoustic and vibrational disturbances that may derive from the existing activities and in particular from the operation of the Passante Ferroviario.
With regard to vibrational disturbance, the reference standard is UNI 9614:2017. According to the legislation, there is no specific limit for study or reading rooms. Therefore, it is necessary to take the limit of V_{sor} = 3.6 mm/s^2, in norm prescribed for residences (night) and kindergartens/retirement homes. For lecture or conference rooms, the limit is 5.4 mm/s^2. All other spaces are similar to workplaces, for which the limit is normally 14 mm/s^2.
With regard to acoustic disturbance, particular attention must be paid to study or reading rooms, to ensure that noise re-radiated as a result of vibrations is below the perception threshold. For this aspect, there is no applicable legislation defining limits. A good reference is the

"FTA Transit Noise and Vibration Assessment"[12]. However, a widely accepted limit is $L_{pASmax} \leq 35$ dB(A). Appendix A.3 to ISO/TS 14837-31 shall be used for the calculation, leaving aside the simplifications set out in point A.3.3. Given the particular sensitivity of the building and in order to acquire adequate confidence on the estimates, it is recommended to use finite element predictive models.
With regard to the disturbance due to noise outside the building, the D.P.C.M. of 05/12/1997 applies, with the eventual fulfilment of the "superior performance" criterion as in Appendix A of UNI 11367.
It should be noted that there are transits of trains (especially freight ones) in the Passante during the night suspension of passenger service.
In order to provide an input data to the calculation model of the impact of vibrations and re-radiated noise, in the subsequent design phases the designer will have to carry out a campaign of vibrational measurements throughout the site subject to the intervention, in order to define the current status. Appropriate mitigation measures must be envisaged, which could also include radical choices on the intervention configuration, such as the insulation of the building foundations. The designer will therefore have to assume the relative responsibilities in terms of compliance with the regulatory limit values when the work is finished. For this purpose, post operam measurements will be carried out in all floors/areas of the building.

3.5 AIRPORT CONSTRAINT

As indicated in Art. 41 of the P.G.T. Rules Plan, the areas adjacent to Linate Airport are subject to restrictions on certain types of activities or constructions, which may constitute a potential hazard to air navigation. These areas are identified in Board R08. With reference to the obstacle delimitation surface, the Competition area falls within the Conical Surface (SC), generally between the external horizontal surface (h. 247,85 m a.s.l.) and the internal horizontal surface (h. 147,85 m a.s.l.). The maximum building height in the areas between the two isolevel lines (20 m interval) must be determined by linear interpolation between the two indicated neighbouring heights.
Specifically, the Competition area lies between h. 160 m a.s.l. and h. 147.85 m a.s.l.

[12] The document is available at the link: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Noise_and_Vibration_Manual.pdf

3.6 HYDROGRAPHIC NETWORK

As indicated in Board R09, in proximity of the Competition area, specifically in correspondence of Via Cervignano and Via Monte Ortigara, there is the Cavo Borgognone, identified in the P.G.T. as a canalised watercourse belonging to the private water network. As indicated in Art. 50 of the P.G.T. Rules Plan, a buffer strip 4 m wide from the edge of each bank is foreseen for the network within the Consolidated Urban Fabric (T.U.C.). It will be necessary to carry out a detailed instrumental survey in the following design phases to define its exact position and size. As defined by Art. 7 of the Hydraulic Police Regulation[13] (annex no. 2 of the Rules Plan), no works can be carried out within the riverbeds. Within the buffer zones, interventions as specified in Art. 8 of the Hydraulic Police Regulation are possible, upon authorisation by the competent hydraulic authority.

3.7 EXISTING TREES

Competitors are asked to safeguard existing trees, keeping them in situ or relocating them within the relevant green areas. If it is not possible to plant new trees, competitors should consider the possibility of clearing the site and making design choices that allow for an increase of green areas, as well as of permeability and the regulation of microclimate and urban comfort. The following are the regulatory references on the existing trees, in particular on the existing Platanus tree along Via Monte Ortigara (fig. 18):

- Ministerial Decree of 29/02/2012 (“Emergency measures for the prevention, control and eradication of Platanus coloured canker”) as amended and the Decree of the Regional Council Structure - Decree of the Regional Council Organizational Unit of 16/10/2018, no. 1483, which sets constraints with respect to the execution of excavation works near Platanus trees that must be communicated to ERSAF, at least 30 days before starting the activities.
- Regulations for the Use and Protection of Public and Private Green Areas, adopted by the Municipal Council in the session of 11 December 2017 with Resolution no. 37 of Reg. executive from 31/12/2017 as amended, with particular regard to Art. 46 “Interventions in the subsoil near public and private trees” and which regulates the excavation distances that must remain 5 m from the trunk for Platanus trees with a circumference greater than 120 cm and 3 m for the others.

[13] The Hydraulic Police Regulation is available at the link: https://www.pgt.comune.milano.it/prall2-regolamento-materia-di-polizia-idraulica

fig. 18
The existing Platanus tree along Via Monte Ortigara.

fig. 19
The gas cabin in sub-area 1A.

3.8 SUB-SERVICES

As regards sub-services, there is a gas cabin located in sub-area 1A (fig. 19), at the intersection of Via Monte Ortigara and Via Cervignano, which can be moved and relocated, like all the underground infrastructures.
Competitors must in any case take into consideration that an area like that of the *Nuova B.E.I.C.* will have to house rooms/underground passageways dedicated to technical services, not only because of the presence of the library itself, but also to serve the neighbouring areas to be made available to operators of underground services.

chapter 4 DESIGN INDICATIONS

The architectural structure of the *Nuova B.E.I.C.* must guarantee absolute compliance with the functional programme and must comply with the requirements indicated below.

4.1 GENERAL PROFILE OF THE NUOVA B.E.I.C.

The *Nuova B.E.I.C.* aims to be a large library-laboratory able to combine interdisciplinary access to knowledge, consultation services, cultural production, lifelong learning, digital technologies and research activities, implementing a policy of convergence and integration between the use of free time and study activities, between humanistic culture and scientific culture, between current collections and special collections, between media and different languages, with an aim to represent the complexity and multifaceted development of contemporary knowledge, paying particular attention to the new fields of knowledge and their interdisciplinary development.
Nowadays, putting skills and their regeneration throughout life front and centre, aiming at directly involving communities in the life of cultural institutions, conceiving cultural production processes as a qualifying element of citizenship, incorporating the dissemination of technologies and digital skills into the action of a library means defining a service profile that is qualified not only by the presence of certain materials or services, but above all through the web of relationships woven with communities of potential users, each of which is the bearer of specific "cultures" equipped with their own codes, languages, needs to which the library must find a way to give space and legitimacy.
The *Nuova B.E.I.C.* also intends to create a synthesis between different types of libraries, linking basic services to lifelong learning and high dissemination up to touching on those specialist strands that are closest to the cultural traditions not only of Milanese and Lombard society, but to the great strands of European and world culture.
The breadth of the *Nuova B.E.I.C.* will also be expressed through its range of action. It will, in fact, develop its activity on several different and complementary levels:

- at the metropolitan level: as a new central library of the Milanese Library System (considered that the European Library will take over the role currently played by the Central Municipal Library of Palazzo Sormani), supporting the growth and evolution of the entire network of the Milan metropolitan area, providing coordination and support to the other libraries and promoting the integration of services and wider accessibility of documentary resources present in the city, to maximize the offer in favour of

students, scholars, researchers, professionals and simple readers;
- at regional level: taking on some regionally-mandated tasks, such as the collection and enhancement of Lombardy publishing output;
- at national level: actively collaborating in the development of the Italian Digital Library, the implementation of the National Plan for the Promotion of Reading, the National Agenda for Sustainable Development and some policies related to the Italian Digital Agenda;
- at international level: it will be embedded in a network of partnerships for innovation with the largest libraries in the world, proposing itself as a point of reference to create facilitated circuits between Milan and Europe, enhancing the role of the Lombard capital as a major international cultural capital.

4.2 LIBRARIANSHIP PROFILE

The main ideas on which the library project of the *Nuova B.E.I.C.* are embodied in certain choices that characterize it and that can be summarized as follows, for the benefit of those who will have to design environments consistent with this approach.

• Integration between physical and digital dimension

The digital component is no longer something ancillary and complementary to the offer of analog documentary resources, but a pillar of the activity of the library, and represents the connective tissue that must integrate and orient all the components offered by the *Nuova B.E.I.C.* for remote users, but also for those who will physically go to the library and use digital resources on site.

The website of the *Nuova B.E.I.C.* and the BEICDL digital library, created in 2008 and conceived from the beginning as coordinated with the future physical library, will become for many users the main interface to the services offered. This Digital Library will develop in synergy with other existing digitisation projects, primarily the BDL - Lombardy Digital Library developed by the Lombardy Region, and in line with the national objectives defined by the National Digitisation Plan drafted by the Ministry of Culture.

Furthermore, the pivotal role of the digital transition in the development programmes of Milan and the Nation that will predictably characterize the next decades, will involve a particular attention to the offer of media and information literacy programs, aimed at instructing the user to a critical and conscious use of both information and communication sources and tools.

The collaboration with the Milanese universities will be crucial, as they will be able to use the Library as a real interdisciplinary research

laboratory, thus contributing to make the *Nuova B.E.I.C.* an institute up to date with the state-of-the-art in terms of digital applied to libraries and digitization of cultural heritage.
A dedicated laboratory will allow people with cognitive and relational problems to participate in the creation of digital resources and services by integrating with the other service structures of the library. The laboratory aims to create the conditions for participants to develop content and graphic products that favour the widest accessibility to the digital resources of the *Nuova B.E.I.C.*, not only in terms of data and information organization, but also in terms of language and structuring of services. The project should also promote an understanding of the characteristics that information and educational resources should possess in order to be fully accessible to people with learning disabilities and autism disorders.

• Balanced synthesis between cultural use and production
The *Nuova B.E.I.C.* will not have the purpose of transmitting only consolidated knowledge, but is conceived as a place of cultural production, of expression of creativity, of serendipity, of development of critical capacities, where one does not go only to access the information recorded in the documents, but in which knowledge is formed around the users and what they do.
The "culture of doing" and "do-it-yourself", in a digital - but not only - environment, is a characteristic feature of our time and in particular of youth culture, which is expressed in activities in which theory and practice are not respectively a before and after, but are indistinct moments of a single process, made of manual skills, entrepreneurship, creativity. The best-known phenomenon of this trend is that of makers, which manifests itself through activities marked by a continuous experimentation in which materiality and dematerialization coexist harmoniously in physical places – the fablabs – in which shared digital manufacturing is carried out. The makers are exponents of a "collaborative counterculture" that opposes the conventional style of industrial production and combines the tradition of craftsmanship with confidence in technologies, hypothesizing production processes "from below". Behind the makers' philosophy there is therefore also a model of new economy, based on low-cost technologies freely accessible to all.
Sharing and experimentation, participation and production are all consistent with the *Nuova B.E.I.C.* project and its experiential impact, which aims to propose the library as a space for collaborative learning and a laboratory for sharing knowledge, in which enjoyment and cultural production represent two constantly communicating poles.

• Variety and richness of collections
The design of the collections, and in particular their extensive open-

shelf offer and the balance of paper and digital offer, aims to combine the ambition to represent contemporary knowledge in all its forms with the centrality of use, aimed on the one hand at enhancing the multiplicity of possible approaches to materials and on the other hand to enhance the different nature and consistency of the objects that make up the collections.
The goal is to create a dialogue between the collections and the laboratory and experiential activities; to weave a tight dialectic between the thematic and disciplinary organization of the collections; to seek strong intersections between current and special collections, which will play a significant role in the *Nuova B.E.I.C.*

• Active participation and centrality of users
The *Nuova B.E.I.C.* will be an open platform that will make available a series of tools, promoting the protagonism of citizens, supporting them in the acquisition of skills useful for active and conscious participation (participatory literacy) and involving the community in order to identify subjects who have certain skills and who are willing to share them with other users of the library.
The presence of external tutors who can provide support to users, the collaborative development of collections thanks to the involvement of experts, the testing of new products or technological supports by groups of users, the mutual learning circles formed by citizen groups connected to specific collections or specific topics: these and other activities will be launched to encourage the direct engagement of citizens, strengthening and extending the system of alliances between the libraries and the territory already existing in Milan.

* * *

The services offer will develop essentially around two forms of proposal that stem from as many interpretations of the library function, with varying levels of formality and oriented to meet different needs. In this ideal bipartition of the offer, we can distinguish between a "horizontal" dimension – deriving from the cultures of the 21st century (essentially identifiable with the services offered in the entrance area and in the B.E.I.C. Forum) – and one closer to the library tradition and conveyed essentially in the departmental sections.

• B.E.I.C. Forum; entrance area, reception and first information
It is the main stage of the library, where a multiplicity of services and activities related to reading, experimentation, production, learning and gaming can be found. The main characteristics of this area – which is aimed at everyone, but will pay particular attention to the youth – are:
- informality, because it will have to attract people who will not

necessarily attend the library for study purposes;
- versatility, because its spaces will have to host diversified activities and will have to be flexible and easily re-arrangeable according to needs;
- attractiveness, because it will make available to the public a series of opportunities for engagement and creative experimentation, which add areas ranging from music, digital, broadcasting, to manual activities, to the fields of action traditionally covered by libraries.

The deep integration between use, learning and production is achieved through the deployment of opportunities in contiguous environments such as:

- a review of editorial novelties with an introductory function to the reading and in-depth study catalogue of the library;
- an international newsstand of newspapers and periodicals (on paper and/or digital media) and some thematic exhibitions that will be renewed periodically;
- temporary exhibitions of documentary material and more;
- reception, guidance and first information services;
- lifelong learning-oriented activities and services;
- activities related to performing arts and their communication through the web, accompanied by the availability of support tools (e.g. musical instruments, equipment and workstations for audio and video editing, etc.);
- production activities – such as a professional radio studio – capable of making the relationship of the library with the world of cultural production visible;
- activities related to gaming and interactive media;
- activities related to digital manufacturing, robotics, artificial intelligence applications, podcasting;
- multi-purpose rooms usable for laboratory activities, courses, conferences, tutoring and information and media literacy activities;
- auditorium.

The presence of independent cultural production activities will give the *Nuova B.E.I.C.* a strong Indie nuance, allowing people to produce lyrics, music and other that could be distributed by the *Nuova B.E.I.C.*, becoming part of its heritage, but also represent another component of its identity as a recreational, production and creation space of interhuman, interpersonal, interdisciplinary, intergenerational, intermediary relationships between analog, objects and digital. The *Nuova B.E.I.C.* could also provide "editorial" support to these self-produced contents, as well as tools for printing and carrying out scouting activities for new authors, through a policy of partnership with the world of publishing.

The B.E.I.C. Forum will also contain some commercial functions, which will be partly organized according to the logic of the temporary shop to ensure dynamism and novelty to the offer.

• Departmental sections

The collections are divided into departments – Science and Technology, Humanities and Social Sciences, Arts and Literature – which will host books, periodicals, audiovisual materials, special collections organized as follows:

- an introductory section of each department dedicated to the foundations of the European culture, as a symbolic exergo of the inherently European matrix of the *Nuova B.E.I.C.*, with the most representative authors in all fields of culture;
- thematic interdisciplinary sections on particularly significant topics, conceived as border areas between departments, whose contaminations are the very reasons of their interest and relevance (e.g. digital cultures, citizens and society, European institutions, intercultural dialogue), also to give visibility to thematic nuclei for which a clear distinction between the different disciplinary areas of the departments is not possible, as is the case of some great cultures such as those of India, China, Islam, as well as other non-European cultures;
- the departments of Science and Technology, Humanities and Social Sciences, Art and Literature;
- a wide range of fiction, including all the languages of creativity (written word, image, sound), within the Art and Literature Department;
- the special collections of the library and the temporary exhibitions dedicated to them, which will exhibit their physicality as an integral part of their meaning and evocative power, in a constant dialogue with the current collections.

The Departments area will contain an agile reference collection with information services, specialist consultancy services and a series of online resources, and will be characterized by the presence of a variety of workstations to meet all needs (individual study stations, carrels, study or group activities rooms, reading and informal listening stations). Some spaces will be dedicated to the consultation of historical collections.

A floor storage to contain 250,000 documentary units will allow to keep close to the departments some collections that, although not consulted with particular frequency, can represent a valid integration to what will be placed on the open shelf.

• Imaginarium (children and teenagers' library)

The children and teenagers who will attend the *Nuova B.E.I.C.* will be born in the 21st century and will be educated in a completely

different way from that imagined until a few years ago, in a world in which screens will be pervasive and books will be objects that are less and less present in their daily lives. For this reason, it is necessary that books continue to be a steady element of the offer that the *Nuova B.E.I.C.* will set up for the very young, which will include gaming, robotics and activities aimed at a responsible, conscious and critical use of the new media.
The design of this section takes into account the need for a workshop-style offer to allow young people to approach the different expressive languages in a fun and engaging way, whose cultural offer will result in a unique space for children and teenagers with respect to the similar spaces already present in other municipal libraries. An area of this section should be conceived as an installation and scenographic itinerary, to be periodically rearranged to emotionally involve children and adults in the discovery of books and reading, so that the *Nuova B.E.I.C.* continues to be attractive over time even for those who do not live near its headquarters.
The section will be divided according to use and age groups, trying to avoid mixtures that risk discouraging attendance, in particular of adolescents and young people, who will mainly gravitate on the B.E.I.C. Forum.

• Digital department
Digital can no longer be considered as a mere discipline but is an "environment", a system of technologies, behaviours, practices that refers to a complex substratum of meanings, languages, expressive codes. For this reason, the Nuova B.E.I.C. puts "digital cultures and practices" at the centre of its activities, collaborating with the other institutions that work in this field. Today, digital tools already create unique cultural products, such as databases and portals, which do not go hand in hand with traditional publications, but rather have their own original characteristics.
The coordination and management of the digital activities of the Nuova B.E.I.C. will merge into an autonomous department, with dedicated spaces, partly located in the B.E.I.C. Forum (for activities that may be attractive to the public) and partly integrated into the areas reserved for offices, and which will have to coordinate the following activities:

- a cutting-edge centre for digitisation, able to make the Nuova B.E.I.C. the reference point for standards, good practices and procedures at national and international level, which can carry out digitisation activities also in favour of other bodies, giving impetus to digitisation, metadata based on the semantic web and making available to the public the huge public and private documentary heritage present in Milan, and providing assistance, tools, standards, organisational models and coordination for the

correct preservation of digital;
- a laboratory for innovation in the field of technologies applied to access to information, digitisation and data analysis, where applied research can be carried out in collaboration with the Milanese universities to test technologies and develop software applications that will contribute to the constant improvement of the services offered by the *Nuova B.E.I.C.*;
- the theatralisation of some components of the digitisation activity, making them visible to the public (on the model of what has been done in museums with open restorations), creating workshops in the areas adjacent to those accessible to visitors to the *Nuova B.E.I.C.*, where they can attend, directly or through digital walls, some digitisation activities;
- the creation of a laboratory aimed at the full integration of people with cognitive and relational problems in the creation of digital library resources and services;
- the provision of basic and advanced training (target-oriented) on the various technical, cultural and legal aspects of the digitisation of cultural objects;
- a qualified strategy of partnerships at national and international level aimed at increasing the sharing of data and content, the management of web archiving, podcasts, virtual exhibitions and site archiving, the management of coordinated access to digital humanities projects and the conservation of digital native personal archives.

• Storage

Storage is a fundamental element in the physiognomy of the library – we could say that it is one of its hardware components, complementary to the software component ideally represented by the B.E.I.C. Forum – because the *Nuova B.E.I.C.* will keep the Lombard Regional Archive of the publications received for legal storage; because it will give a long-term growth perspective to the collections; and finally because the *Nuova B.E.I.C.* will contain the collections of the Sormani Library and other library institutes. The minimum capacity foreseen for the central storage, whose management will be fully automated, will be 2.5 million volumes but may increase in the execution phase based on the technological solution that will be adopted.

In any case, the storage, whose size and characteristics will accommodate the minimum number of volumes indicated above and a robotization system, must guarantee a structural response to the stresses/disturbances induced by the presence of the railway tunnel while in operation, compatible with the operation of the robotization system.

• Commercial functions
The library will have spaces to be used, by concession, for catering activities and for commercial activities (including a bookshop), some of which will be a prosecution of the B.E.I.C. Forum, and more particularly of the newspaper library.
The presence of these commercial activities is complementary to the offer of library services, both because it qualifies the *Nuova B.E.I.C.* as deeply interwoven with other urban functions, and because it is entrusted in part with the experiential content that users will perceive. These activities, in addition to completing the offer of the library, will contribute to the sustainability of management.

4.3 FUNCTIONAL PROGRAMME

The architectural design will have to meet certain requirements, the respect of which is essential to guarantee the service functions.

• The overall accessibility of the library
A truly inclusive library must be based on the idea that all capabilities are on the same level. The need to create equal access conditions, not dependent on individual skills, concerns both the ways in which services and materials are organised to be usable by people with different skills, and the building, its overall usability and detail, the absence of differentiated paths that could be perceived as discriminating. This idea of accessibility can also be ensured by creating an area in the open spaces near the Imaginarium section where the games are suitable for all children, thus allowing to remove obstacles right at the entrance.

• Sustainability and management control
The building must metabolize the concepts of environmental sustainability and digital transition: on the energy consumption side, it must be designed according to the most advanced principles of sustainability and savings, tending as much as possible to zero impact; on the management level, the spaces must embrace a fully data-driven approach, that is, they must be prepared with sensors and devices to allow for the systematic and continuous collection of data that, properly processed and interpreted, will constitute a support system for management and decisions. But the users themselves will produce data, which will be collected as part of their multiple interactions with the spaces, services and tools made available.

• User autonomy
The *Nuova B.E.I.C.* will encourage the autonomy of visitors in the use of certain functions. For example, it will be necessary to provide for

self-service registration of loans and returns trough adequate self-loan stations, "smart" lockers and similar equipment. All these devices must comply with ISO 15693-3 and 18000-3 standards, operate at a frequency of 13.56 MHz and work with the application software in use through the SIP2 (Standard Interchange Protocol) communication protocol to ensure the operation and full interoperability of the systems already in use in the Milan Library System.
A part of the building – in particular at least one study room – must be accessible 24/7 through recognition systems that will allow authorized users to access the structure even in the absence of personnel. Workstations and study and co-working spaces must also be reserved completely autonomously, by means of remote systems.

• The flexibility of spaces and installations
The coexistence of multiple and interchangeable functions, in addition to requiring a strong flexibility in the set-ups (more accentuated in some areas, such as the B.E.I.C. Forum and the Imaginarium), involves a redefinition of the traditional library spaces, which lose rigidity and univocity in order to express themselves in multiple uses, determined from time to time by users. The set-up must include areas characterised by a lower degree of formality, as in the case of transit spaces, which can accommodate artistic installations and other small temporary thematic exhibitions.

• Digital signage
The building will have to provide an effective digital signage system that informs users about the activities planned by the library, to effectively direct specific groups of people to certain places and times with information and tailor-made entertainment, or to create interactivity.

QUANTITATIVE PROGRAMME
Summary of requirements to be met by the project

Total indicative area of the B.E.I.C.	**30,000 sqm***
of which Entrance area	1,600 sqm*
of which Imaginarium	1,800 sqm*
of which Commercial spaces	1,350 sqm*
of which Auditorium	1,300 sqm*
of which B.E.I.C. Forum	4,300 sqm*
of which Digital department	1,350 sqm*
of which Departments	7,700 sqm*
of which Automated central storage	6,000 sqm*
of which Internal services	4,600 sqm*
** The size of the surfaces is to be considered indicative and not binding for the designer.*	
Operator workstations	**205**
of which front office workstations	35
of which back office workstations	170

Places for the public	**2,000**
of which informal chairs	395
of which desk workstations	1,205
of which seats in auditoriums or other rooms	400
Computer stations for the public	**180**
of which OPAC and internet stations	20
of which desk PC workstations	100
of which self-loan stations	21
of which gaming stations	30
of which VR workstations	4
of which self-service reproduction stations	5
Bibliographic units	**3,000,000**
of which open shelf volumes and audiovisuals	158,500
of which open shelf periodicals	1,500
of which volumes in the floor storage	300,000
of which volumes in the central storage	2,500,000
of which audio-visual in storage	20,000
of which bibliobus storage	20,000
Exhibition areas	
fitted walls and bulletin boards (in linear metres)	approx. 150 l.m.

4.4 ORGANISATION OF SPACES AND ROUTES

The general layout of the functional units of the building is described, together with the requirements in terms of volumes, workstations, etc. for each area, highlighting the direct and indirect connections between the various units and the location of external accesses.

• General organisation criteria

Competitors must adopt universal design as a guiding criterion for the design of the work: the building must guarantee barrier-free access to any individual, without distinction or limitation of age, ability or physical condition, and each user will be able to choose the routes he/she wishes and access specific rooms or spaces independently without being forced to use “special” routes or dedicated gates. Tactile and/or sound aids and assistive technologies should be provided throughout the building to facilitate the autonomous use of spaces by people with visual, sensory or cognitive limitations.

The building must be designed to ensure maximum permeability between the areas and floors that compose it when all services are accessible; at the same time it must allow a selective use of the areas, as specified below, because on some days or times of the day only some services may be active.

Independent access from the outside must be guaranteed for commercial activities, to allow their activity even when the library is closed. The auditorium can have a double access, from outside and from the atrium of the building.

Staff and suppliers will access the building through a special entrance at street level, separate from the public accesses.

All exits and gates leading from the various areas of the library to

the outside (including emergency exits) must be protected by anti-shoplifting gates connected to the internal CCTV circuit and equipped with an audible warning device.

A - ENTRANCE AREA

A.1 - Building atrium: the Promenade

It is the entrance area of the library and must be conceived as a covered urban promenade with the function of distributing the flow of visitors towards a series of functional areas foreseen by the programme of the building which face it:

- reception and first information area of the library;
- commercial activities;
- auditorium.

It is appropriate to treat this space as an urban interior, lit by natural light.

The atrium is accessible from the main entrance, facing Via Cervignano/Parco di Porta Vittoria, and can be crossed on the west-east axis, with a public access also from Viale Molise and a possible direct access from the subway of the Porta Vittoria Station of the Passante Ferroviario.

The atrium allows free access to the building during opening hours and does not provide for access control. Orientation must be easy and routes immediately recognisable.

The atrium must have a room for security staff located between the main entrance and the anti-shoplifting gates, where the control systems of the building converge, and book return stations for the automatic return of loaned works. A book return station must also be provided outside, adjacent to the public entrances, for use when the building is closed. The space behind the book returns is unique and it is connected to the central and floor storage areas of the departmental area by means of automatic transport systems for the relocation of returned works; if the Imaginarium area is accessible from inside the library instead of directly from the promenade, an automatic transport line dedicated to the books of that section must be provided.

A space must be provided for lockers that the public will use to store bags, helmets etc. before entering the library.

A.2 - Reception and first information area of the library

It is adjacent to the promenade from which it is functionally separated by anti-shoplifting barriers, which constitute the only perceptible “threshold” to access the library. Anti-shoplifting barriers should be designed to be as light as possible to minimise visual impact and should be arranged to operate external peripherals (CCTV, turnstiles,

etc.); the width of the gates should be such as to easily allow the passage of wheelchairs and other similar devices.
The guarantee of substantial continuity between the promenade and the reception area must be combined with the need to separate them when the library is closed to the public but the building is open (e.g. for activities taking place in the auditorium), also by means of suitable solutions, preferably concealed.
Once past the anti-shoplifting gates, a person enters the reception area of the library, which includes:

- reception, orientation and first information desk, with an office behind it, and distributed workstations for the staff, for user assistance activities;
- a self-check area, where self-loan stations are concentrated for the registration of outgoing loans, and smart lockers dedicated to the independent withdrawal of available reserved works;
- a review of new publications as an introduction to the range of reading and study opportunities of the library;
- an international newsstand of daily newspapers and periodicals (on paper and/or digital support) and some thematic reviews that will be renewed periodically;
- an area equipped for exhibitions, in continuity with the other functions.

The area is conceived as an open space and the articulation of its spaces is obtained by using shelves and furnishing elements, in order to avoid sharp divisions between the various components of the offer and to guarantee the public a comfortable and informal place to stay in. In this area the materials will be displayed mainly flat and placed at a height suitable for visual browsing, which will be the main way of selection by the public.
The newsstand will provide readers with both paper and digital periodicals. For the consultation of the latter, special readers (tablets or similar devices) must be provided, preferably integrated into special charging and withdrawal systems with user identification, which can be installed in stand-alone and/or wall-mounted mode.
This area can be directly connected to the cafeteria/bistrot by means of an access protected by anti-shoplifting gates.
The reception area of the library leads via signposted routes to the children and families' area if access is not provided directly from the promenade.

QUANTITATIVE PROGRAMME

Units	Reference specifications	Sizing
ENTRANCE AREA		
A.1 - Promenade		
circulation space	no. of people expected during peak crowding period	200
stopover spaces	no. of people expected during peak crowding period	66
guard booth for security staff	no. of workstations	2
“book return” stations	no. of stations, one of which can be used from outside the building during the library closing hours	4
sorting room for “book return” stations	contains the systems that automatically connect the automatic return stations to the storages and the various areas of the library	1
cloakroom lockers for bags, backpacks, helmets, etc.	no. of lockers	500
A.2 - Reception and first information area		
anti-shoplifting gates	no. of gates	10
reception, orientation and first information counter	no. of staff workstations	2/3
back-office workspaces	no. of staff workstations	5
quick OPAC/Internet consultation	no. of standing PC stations	5
OPAC/Internet consultation	no. of seating PC stations	5
infopoint area	no. of totems, video walls, wall-mounted or free-standing notice boards in the centre of the hall	5
self-loan station	no. of stations	8
smart locker to withdraw booked material	no. of master modules no. of withdrawal points	3, extendable to 6 300, extendable to 600
reproduction service	no. of reproduction stations to the public	1
A.3 - News, current affairs, thematic proposals		
exposition of volumes	no. of volumes on shelves with 5-6 shelves, flat display linear metres of shelves	8,000 1,600 l.m.
unsystematic consultation	no. of informal chairs	25
unsystematic consultation	no. of desk workstations	25
individual service workstations for room staff	no. of staff workstations	1
A.4 - Magazines and newspapers		
exposition of magazines	no. of foreseen titles (magazines and newspapers) in displays with compartment behind for back issues	250
unsystematic consultation	no. of informal chairs	35
unsystematic consultation	no. of desk workstations	40
internet and online newspapers consultation on tablets or similar devices, including identification and charging systems	no. of single devices	40
individual service workstations for room staff	no. of staff workstations	1

A.5 - Exhibition area		
fitted walls and bulletin boards for bibliographic and art exhibitions	linear metres	20 l.m.
A.6 - Servizi accessori		
toilets (indicative quantification)	no. of users	10
service rooms (for storage of cleaning trolleys, equipment for exhibition area, etc.)	no. of rooms	2

B - IMAGINARIUM

B.1 - Children and families area

This section of the library, due to the needs and the way in which the public uses the space, must be easily accessible from the library entrance and must have its own green area, equipped and protected (therefore preferably inside the building). For this reason, access to this section can be provided either from the reception area of the library or from the promenade; in this case the entrance must be protected by anti-theft barriers with the characteristics already described and, as for the library, it must be possible to close, while the promenade is open.

The section requires specific design attention from the point of view of fittings and noise reduction: this is in fact a non-silent space, which requires measures and solutions aimed at minimising the risk of noise interference with the other areas of the library and among the sections that make it up.

The section is organised as follows:

- "Parents and babies" space (0-2/3 years): soft space, tactile books and picture boards, games (puppets, pillows, trolleys, things to push and drag), possibility of listening to stories together, breastfeeding;
- "Discover and play" space (3-5/6 years): space for exploration, discovery and play, set up to offer children places to hide with books or to play together with adults (e.g. little houses, tents, etc.). Around 3,000 documents placed in shaped containers and on low shelves; creativity and manipulation space;
- "Grow and learn" space (6-9 years), with around 10,000 documents, including audiovisuals and comics; includes comfortable reading spaces on the floor, on pouffes and seats around tables of a suitable height; bibliocoding space to approach the computational thinking;
- "Imagine and create" space (10-13 years), with around 10,000 documents, including audiovisuals, comics, opportunities for group work and aggregation; educational robotics space to approach the automation;

- "Parents area" with books, magazines, children's websites, books to read together and reviews of things to do in the city with children.

The following spaces should be designed:

- a space that will host installations aimed at proposing recreational, theatrical and creative activities, to be rearranged periodically by commissioning site-specific projects;
- a space for temporary exhibitions;
- a space for reading drama activities, closed and set up with steps and a scenic wall, also equipped with a digital screen for screenings to children or adults. At the front there is a reader's chair and a kamishibai theatre.

The equipped green area must be accessible only from the children and families' area and is reserved for its public. It is a space dedicated to the youngest children and their parents, which can be used for individual or group reading activities, for organised play and for workshop and drama activities. Its character, informal and joyful, should stimulate the imagination and fantasy. Designers should take care, when choosing fixed furniture, to select outdoor elements that guarantee solidity, safety, resistance to wear and tear and to weather, and ease of maintenance. Mobile furniture elements should be provided with a storage room adjacent to the section, to facilitate their movement. For the storage of mobile furniture, a room must be provided and located near the section to facilitate its handling.

QUANTITATIVE PROGRAMME

Units	**Reference specifications**	**Sizing**
IMAGINARIUM		
B.1 - Reception		
foyer/circulation space	no. of people expected during peak crowding period	50
reception, orientation and first information counter	no. of staff workstations	2
back-office workspaces	no. of staff workstations	5
quick OPAC/Internet consultation	no. of standing PC stations	3
OPAC/Internet consultation	no. of seating PC stations	3
infopoint area	no. of totems, video walls, wall-mounted or free-standing notice boards in the centre of the hall	5
child-friendly, self-loan station	no. of stations	3
B.2 - "Parents e babies" space (0-2/3 years)		
storage for prams and pushchairs	no. of prams	20
play and animation spaces	no. of children	20
pit-stop room	no. of rooms equipped with water, bottle warmer, etc. for nappy changing and breastfeeding	1
exposition of volumes (in shaped containers)	no. of volumes no. of containers	1,000 20

B.3 - "Discover and play" space (3-5/6 years)		
play, reading and animation spaces	no. of children	30
consultation spaces for adults and children	no. of children	15
exposition of volumes (in shaped containers and on low-lying shelves)	no. of volumes no. of containers	3,000 60
B.4 - "Grow and learn" space (6-9 years)		
spaces for reading, unsystematic consultation, play and relax activities	no. of informal chairs	30
reading, systematic consultation, study, laboratory activities	no. of desk workstations	20
exhibition of volumes and thematic areas	no. of volumes on shelves with 4-5 shelves, including comics and audiovisuals linear metres	10,000 400 l.m.
individual service workstations for room staff	no. of staff workstations	1
coding laboratory	no. of desk PC stations no. of cabinets for storing equipment	10 2
B.5 - "Imagine and create" space (10-13 years)		
spaces for reading, unsystematic consultation, play and relax activities	no. of informal chairs	30
reading, systematic consultation, study, laboratory activities	no. of desk workstations	40
exhibition of volumes and thematic areas	no. of volumes on shelves with 4-5 shelves, including comics and audiovisuals, mixed display linear metres	10,000 400 l.m.
individual service workstations for room staff	no. of staff workstations	1
educational robotics laboratory	no. of desk PC stations no. of cabinets for storing equipment	10 2
B.6 - "Parents area"		
exposition of volumes	no. of volumes on shelves with 5 shelves, mixed display linear metres	1,000 44 l.m.
reading and consultation	no. of informal chairs	15
B.7 - Accessory services		
thematic installation	no. of spaces for thematic installation to be rearranged periodically, to be used as a stage setting for activities with children no. of children	1 25
temporary exhibitions	linear metres of fitted wall	20 l.m.
reading and drama space (storytelling corner)	no. of spaces for reading and drama activities no. of children	1 25
toilets and service rooms (indicative quantification)	no. of users	15

C - COMMERCIAL SPACES

C.1 - Commercial activities

A bookshop, a cafeteria/bistrot with a cold food service and/or kitchen and some temporary stores are included.
It is advisable for the spaces dedicated to these activities to be next to each other, in order to allow for different subdivisions over time, as necessary. The premises must be prepared with all the plant connections and in accordance with the regulatory requirements for these activities, but the study of the internal layout is not required, as this will be left to the future concession holders. The cafeteria must also be directly accessible from the library, through a gate protected by an anti-shoplifting system. It must be possible to close the gate when the cafeteria is in operation and the library is closed, in order to prevent customers from accessing.

QUANTITATIVE PROGRAMME

Units	Reference specifications	Sizing
COMMERCIAL SPACES		
C.1 - Commercial activities		
cafetteria/bistrot	in continuity with the magazines and newspapers area of the library no. of desk workstations indicative average surface	 120 270 sqm
bookshop	no. of titles (approximate) indicative average surface	30-35,000 200 sqm
pop-up stores	no. of temporary shops indicative average surface	3-4 100 sqm

D - AUDITORIUM

D.1 - Auditorium

Cultural events organised or hosted by the library are held in this area.
The auditorium has a capacity of 300 seats and must be equipped to host conferences, presentations, readings, screenings, concerts and theatre performances. For this purpose, it must be designed to obtain permanent authorisation for public performances.
The hall must guarantee the highest standards of acoustic quality to ensure adequate enjoyment for both activities using amplification systems for voice and musical instruments and for those using non-amplified instruments.
The auditorium must have a stage and backstage area, dressing rooms for artists, a storage room for equipment located near the hall, a control room and a box for simultaneous translation. Outside the auditorium there is a foyer with a reception desk and a cloakroom. The foyer should be connected to the cafeteria/bistrot,

which will guarantee a food&beverage service during and after the performances.
The autonomous entrance will allow the use of the auditorium even when the library is closed and possibly for initiatives completely unrelated to the library, granting its use to third parties against payment of a fee.
The auditorium will be used jointly with the multi-purpose rooms of the B.E.I.C. Forum for conference activities; it is therefore necessary to provide for the rooms to be located in an area of the building as close as possible to the auditorium, in order to facilitate the management of public flows for this type of activity.

QUANTITATIVE PROGRAMME

Units	**Reference specifications**	**Sizing**
AUDITORIUM		
D.1 - Auditorium		
foyer auditorium	no. of people expected during peak crowding period	300
auditorium	no. of seats	300
reception counter/tickets desk	no. of staff workstations	3
cloakroom	no. of hangers no. of spaces for bags	300 100
control room		1
dressing rooms	no. of 2-person dressing rooms no. of 4-person dressing rooms no. of changing rooms (common area)	2 1 1
simultaneous translation booths		3
storage and service rooms, adjacent to the stage		2
toilets and service rooms (indicative quantification)	no. of users	20

E – B.E.I.C. FORUM

The B.E.I.C. Forum is the main stage of the library, which embodies its multiple nature and its character as a laboratory of discovery, learning and sharing. Due to its character, which is informal and open to a wide and diverse audience, it is closely related to the reception and first information area of the library, to which it can be directly connected.
The “Music, entertainment, gaming and new media” section offers the opportunity to experiment with the creative languages of music and audiovisuals, both to acquire and improve individual critical skills and to acquire skills useful for creative use. The section has a small storage room equipped to hold 10,000 audiovisual documents of various formats (CDs, DVDs, LPs).

Gaming stations allow individuals and small groups to use the main consoles and a selection of games from the present and the past (retrogaming).
In the laboratory area, a series of multi-purpose rooms, which can be reconfigured as needed, will host practical and creative activities.
All the activities and sections of the B.E.I.C. Forum are characterised by the search for a strong integration between the languages of the 21st century and the presence of books, magazines and paper media, which represent both an element of cultural continuity and the tools for deepening the experiential dimension.

QUANTITATIVE PROGRAMME

Units	**Reference specifications**	**Sizing**
B.E.I.C. FORUM		
E.1 - "Music, entertainment, gaming and new media" section		
foyer/circulation space	no. of people expected during peak crowding period	150
librarians' counter	no. of staff workstations	7
back-office working spaces	no. of staff workstations	10
quick OPAC/Internet consultation	no. of standing PC stations	5
OPAC/Internet consultation	no. of seating PC stations	6
infopoint area	no. of totems, video walls, wall-mounted or free-standing notice boards in the centre of the hall	5
cloakroom lockers for bags, backpacks, helmets, etc.	no. of lockers	50
exposition of documents	no. of CDs/DVDs/LPs, flat display, in displays suitable for this type of media linear metres	1,000 142 l.m.
audiovisual storage	no. of CDs/DVDs/LPs	20,000
consultation stations	no. of desk PC stations	8
multimedia stations	no. of informal chairs for listening as "sonic chair"	10
exposition of volumes	no. of volumes on video/cinema/new media/gaming, on shelves with 5-6 shelves, mixed display linear metres	5,000 200 l.m.
exposition of volumes	no. of volumes on video/cinema/new media/gaming, on shelves with 5-6 shelves, mixed display linear metres	5,000 200 l.m.
exposition of magazines and newspapaer	no. of current titles on video/cinema/new media/ gaming, with back boxes	40
unsystematic consultation	no. of informal chairs at a 4-seater round table	40
unsystematic consultation	no. of informal chairs of various kinds	80
Hi-End listening room	no. of soundproof rooms with Hi-End equipment no. of seats	1 10-12
video room	no. of soundproofed viewing rooms no. of seats	2 10-12
recording room	no. of soundproofed rooms with a window to one of the music rehearsal rooms	1

box podcast / self recording	no. of soundproof boxes for recording podcasts and tutorials	4
gaming stations	no. of 2-person gaming stations	10
toilets and service rooms (indicative quantification)	no. of users	20
E.2 - Laboratories / multi-purpose rooms		
laboratories / makerspace / fablab	no. of laboratories equipped for hobbies, modelling, drawing, video production, 3D printing, robotics, didactics, VR, Arduino, etc. (flexible spaces) no. of people in each space	4 6-12
multi-purpose rooms	flexible, modular multi-purpose rooms of various sizes no. of seats for each room no. of seats (total)	 12-25 125
storage rooms	no. of storage rooms of various sizes	3
radio-tv station	no. of rooms for on-line tv/radio station, with window facing areas open to the public, with service spaces	1
carrels / co-working box	carrels and stations for digital experimentation / coworking stations no. of single boxes no. of multiple boxes (5 places)	 2 2
toilets and service rooms (indicative quantification)	no. of users	15
E.3 - Temporary exhibitions		
temporary exhibitions	linear metres of fitted walls	30 l.m.
VR boxes and immersive installations		3
storage rooms		1

F – DIGITAL DEPARTMENT

Coordination and management of the digital activities of the *Nuova B.E.I.C.* will be carried out in an autonomous department that will have dedicated spaces, partly located near the B.E.I.C. Forum (for activities that may be attractive to the public) and partly integrated into the office areas.
In particular, some digitisation activities of cultural heritage, like open restorations, will be carried out in laboratories located in areas near those accessible to B.E.I.C. Forum visitors, who will be able to assist directly or through transparent or digital walls.

F.1 – Cultural heritage digitisation centre

The digital department includes:

- an avant-garde centre for digitisation, capable of making the *Nuova B.E.I.C.* the reference place for standards, good practices and procedures at a national and international level, which can also carry out digitisation activities for other bodies, boosting the digitisation, the metadating according to the semantic web and the provision to the public of the huge public and private documentary heritage present in Milan, and giving assistance,

tools, standards, organisational models and coordination for correct digital preservation;
- a laboratory aimed at the full integration of people with cognitive and relational disabilities in the implementation of digital resources and services of the library;
- services for the management of web archiving, podcasts, virtual exhibitions and site archiving, for the management of coordinated access to digital humanities projects and for the preservation of digital native personal archives.

F.2 – Innovation Lab

Some spaces at the disposal of the Milanese Universities will allow researchers, data scientists and developers to use the *Nuova B.E.I.C.* as an interdisciplinary research space and to contribute to making the library an up-to-date institution in terms of digital technology applied to research services and access to online content, developing and testing machine learning and artificial intelligence applications to improve the services offered to the public.

QUANTITATIVE PROGRAMME

Units	**Reference specifications**	**Sizing**
DIGITAL DEPARTMENT		
F.1 - Cultural heritage digitisation centre		
acceptance, control and deposit of incoming volumes and objects	no. of rooms with safes for valuables, shelves, sorting tables, tables and equipment for small consolidation and restoration work	1
digitalisation of books, manuscripts and two-dimensional graphics in general	no. of rooms (20 sqm/room) with digitisation equipment and diffused and controlled light (not direct light); one of the rooms must be located so that the interior is clearly visible from the B.E.I.C. FORUM, by means of a glass wall; scanner + workstation no. of workstations	3 6 (2 workstations/ room)
audio, video and object digitisation (also in 3D)	room with digitisation equipment no. of workstations	2
quality control (colour, foliation, naming, technical and structural metadata) and validation activities, metadata control and format conversion	no. of workstations equipped with high quality monitors	4
long-term archiving; medium-term archiving; monitoring of all management functionalities (access, monitors, librarianship modules, security, setting, etc.)	no. of air-conditioned room with redundant 4-5 PB disk storage, connection to mirror site, uninterruptible power supply. Server storage (portal, communications, monitoring, security, etc.), network hub (WEB, WAN, LAN)	1
management and coordination for lines of activity	no. of workstations	1

rooms for special projects (B.E.I.C. and digital portal management, virtual exhibitions, in-depth workshops, educational and tourist blogs, social activities)	workstations in two or more flexible rooms with variable layout, with tables, mobile chairs, technical equipment no. of workstations	 10
creative laboratory for people with autism and down syndrome	no. of rooms with workstations, equipment, 3D printers, advanced graphics, etc. no. of workstations	1 10
spaces for national and international collaboration projects	class/meeting room to be built according to particular requirements to be studied with specialists no. of seats	 15
store room for machinery and equipment spare parts	no. of store rooms	1
Data Processing Centre (DPC)	no. of offices with workstations, equipment, cabinets, shelves, etc.	1
toilets and service rooms (indicative quantification)	no. of users	10
E.2 - Innovation Lab		
AI & Machine Learning Lab	room for research and development activities, wired no. of workstations	 4
VR Lab	room for research and development activities, wired no. of workstations	 4
Robo Lab	room for research and development activities, wired no. of workstations	 4

G - DEPARTMENTS

This area of the library houses the open-shelf collections, reference services, reading stations and reading rooms. It has a total capacity of 1,011 seats and accommodates 108,500 volumes and 1,000 open-shelf periodicals, as well as a floor storage organised with compact shelves with an additional capacity of 300,000 volumes. The storage is intended to keep close to the departments some collections, which, although not particularly consulted, can be a valid addition to the open-shelf collections.

The three departments - Science and Technology, Humanities and Social Sciences, and Arts and Literature - are located in continuity, preferably on the same level, and share a reception area in which the public assistance desks and the offices supporting the librarians' front office activities are concentrated.

The library desk is located close to the main access point to the departmental area and adjacent to the floor storage and to one of the delivery points for works stored in the main automated storage, for which a "buffer" space with enough space to hold up to 10 loading units must be provided.

Each department will host books, periodicals, audiovisual materials and special collections organised as follows:

- an introductory section dedicated to the main authors of European

culture in the reference disciplines concerned;
- thematic sections of an interdisciplinary nature on themes of particular relevance, conceived as border territories, subject to contaminations that constitute the reasons for their interest and topicality (e.g. digital cultures, citizens and society, European institutions, intercultural dialogue), also to give visibility to thematic nuclei for which it is not possible to make a clear distinction between the different disciplinary areas of the departments, as in the case of some major cultures such as those of India, China, Islam, as well as other non-European cultures;
- current open-shelf collections, in which media and publishing types coexist in order to give a wide and articulated overview of the disciplines concerned;
- spaces equipped for temporary exhibitions dedicated to special collections of the library, which will display their physicality as an integral part of their meaning and evocative power, in a constant dialogue with the current collections.

The Departments area will provide access to a flexible reference collection, local and community information services, specialist consultancy services and a range of online resources, and will be characterised by the presence of a variety of workstations to meet all needs (individual study stations, carrels, study or group activity rooms, informal reading and listening stations). It is required that these workstations are distributed in the space (or grouped in small "islands" to avoid the "classroom" effect).

A separate consultation room (no. 20 stations) will be dedicated to the consultation of historical collections and rare materials. Here, the windows must be screened with UV filtering films and the lighting fixtures must be chosen in relation to the type of radiation they emit, in order to reduce light damage to paper materials.

All study stations must be bookable remotely. In carrels and group study rooms, access is enabled by means of a code sent via the web. H24 7x7 study rooms are an integral part of the departmental section, with access granted only to authorised users by means of automatic recognition systems and under constant video surveillance. The designer may envisage placing the planned study stations in a single H24 room or subdividing them into several rooms, maintaining the indicated capacity.

In this case, the rooms must be able to be used separately and independently from each other. Although the rooms are functionally part of the departmental section, they may be located as required in the building, in a position that guarantees autonomous, easy and secure access even when the library is closed.

The equipment of the departmental area is completed by a panoramic study room, located at the top of the building, with a practicable terrace equipped for studying and reading in the open air.

QUANTITATIVE PROGRAMME

Units	Reference specifications	Sizing
DEPARTMENTS		
G.1 - Reception, general consultation and local documentation		
librarians' counter, with delivery point for works of the automated storage and a "buffer" space	no. of workstations	4
back-office workspaces	no. of workstations	6
unified floor storage	storage room with compactable shelves, for the three departments and special funds. no. of documentary units	 300,000
quick OPAC/Internet consultation	no. of standing PC stations	7, expandable to 15
reading and studying	no. of seating stations	30
copy/print point	no. of self-service reproduction stations	1
general consultation and local documentation exhibition	no. of volumes on shelves with 5-6 shelves, spine display linear metres	5,000 200 l.m.
cloakroom lockers for bags, rucksacks, helmets, etc.	no. of lockers	300
G.2 - "Science and Technology" department		
librarians' counter	no. of staff workstations	3
back-office workspaces	no. of staff workstations	5
self-loan station	no. of stations	2
glass box for advice and reference	soundproofed glass box near the counter for reference service	1
volumes for specialist advice, to be placed in the glass box	no. of volumes on shelves with 6 shelves, spine display linear metres	500 20 l.m.
basis of European culture	no. of volumes on shelves with 6 shelves, mixed display linear metres	1,500 60 l.m.
display of volumes	no. of volumes on shelves with 6 shelves, spine display linear metres	17,000 485 l.m.
Thematic area A interdisciplinary documentation	no. of volumes on shelves with 5-6 shelves, mixed display linear metres	1,500 60 l.m.
Thematic area B interdisciplinary documentation	no. of volumes on shelves with 5-6 shelves, mixed display linear metres	1,500 60 l.m.
Thematic area C interdisciplinary documentation	no. of volumes on shelves with 5-6 shelves, mixed display linear metres	1,500 60 l.m.
display of periodicals and newspapers	current issues, with flap display and compartment behind for back issues	250
OPAC consultation	no. of seating PC stations	2
consultation of digital resources	no. of seating PC stations	6, expandable to 10
consultation of microforms	no. of stations equipped for consultation of microforms	3
copy/print point	no. of self-service reproduction stations	1
reading	no. of informal chairs	20
reading and studying	no. of desk workstations	120
study carrel	no. of carrels	16
rooms for groups	users in 6-10 people rooms equipped with a group table no. of table seats	 50

temporary exhibitions	exhibition space for bibliographic exhibitions / objects / special collections / art installations linear metres of fitted walls and bulletin boards	 25 l.m.
toilets and service rooms (indicative quantification)	n. of users	20
G.3 - "Humanities and Social Sciences" department		
librarians' counter	no. of staff workstations	3
back-office workspaces	no. of staff workstations	5
self-loan station	no. of stations	2
glass box for advice and reference	soundproofed glass box near the counter for reference service	1
volumes for specialist advice, to be placed in the glass box	no. of volumes on shelves with 6 shelves, spine display linear metres	2,000 80 l.m.
basis of European culture	no. of volumes on shelves with 6 shelves, mixed display linear metres	2,500 100 l.m.
display of volumes	no. of volumes on shelves with 6 shelves, spine display linear metres	27,000 770 l.m.
Thematic area A interdisciplinary documentation	no. of volumes on shelves with 5-6 shelves, mixed display linear metres	1,500 60 l.m.
Thematic area B interdisciplinary documentation	no. of volumes on shelves with 5-6 shelves, mixed display linear metres	1,500 60 l.m.
Thematic area C interdisciplinary documentation	no. of volumes on shelves with 5-6 shelves, mixed display linear metres	1,500 60 l.m.
display of periodicals and newspapers	current issues, with flap display and compartment behind for back issues	480
OPAC consultation	no. of seating PC stations	2
consultation of digital resources	no. of seating PC stations	6, expandable to 10
consultation of microforms	no. of stations equipped for consultation of microforms	3
copy/print point	no. of self-service reproduction stations	1
reading	no. of informal chairs	15
reading and studying	no. of desk workstations	120
study carrel	no. of carrels	16
rooms for groups	users in 6-10 people rooms equipped with a group table no. of seats at the table	 40
temporary exhibitions	exhibition space for bibliographic exhibitions / objects / special collections / art installations linear metres of fitted walls and bulletin boards	 25 l.m.
toilets and service rooms (indicative quantification)	no. of users	20
G.4 - "Arts and Literature" department		
librarians' counter	no. of staff workstations	2
back-office workspaces	no. of staff workstations	2
self-loan station	no. of stations	2
glass box for advice and reference	soundproofed glass box near the counter for reference service	1
volumes for specialist advice, to be placed in the glass box	no. of volumes on shelves with 6 shelves, spine display linear metres	3,000 120 l.m.
basis of European culture	no. of volumes on shelves with 6 shelves, mixed display linear metres	2,500 100 l.m.
display of volumes	no. of volumes on shelves with 6 shelves, spine display linear metres	41,000 1,170 l.m.

Thematic area A interdisciplinary documentation	no. of volumes on shelves with 5-6 shelves, mixed display linear metres	1,500 60 l.m.
Thematic area B interdisciplinary documentation	no. of volumes on shelves with 5-6 shelves, mixed display linear metres	1,500 60 l.m.
Thematic area C interdisciplinary documentation	no. of volumes on shelves with 5-6 shelves, mixed display linear metres	1,500 60 l.m.
display of periodicals and newspapers	current issues, with flap display and compartment behind for back issues	480
OPAC consultation	no. of seating PC stations	2
consultation of digital resources	no. of seating PC stations	6, expandable to 10
consultation of microforms	no. of stations equipped for consultation of microforms	4
copy/print point	no. of self-service reproduction stations	1
reading	no. of informal chairs	20
reading and studying	no. of desk workstations	150
study carrel	no. of carrels	16
rooms for groups	users in 6-10 people rooms equipped with a group table no. of seats at the table	 40
temporary exhibitions	exhibition space for bibliographic exhibitions / objects / special collections / art installations linear metres of fitted walls and bulletin boards	 25 l.m.
toilets and service rooms (indicative quantification)	no. of users	20
G.5 - Special collections		
consultation room for special and rare collections	no. of seats in a reserved consultation room, with access by appointment and personalised advice	35
librarians' counter	no. of stations for service and distribution staff	1
G.6 - Study room with own materials		
panoramic room	study room for those who use only their own materials no. of seats	 200
librarians' counter	no. of staff workstations	1
G.7 - H24 study room		
independent study rooms	seats at the table in study rooms that can be opened independently from the rest of the library no. of seats no. of rooms	 100 2
toilets and service rooms (indicative quantification)	no. of users	20

H – AUTOMATED CENTRAL STORAGE

The central storage serves the conservation purpose and must have a minimum capacity of 2,500,000 volumes. The storage must be designed for fully robotic operation: it is housed in a space that develops in height without floor slabs in order to optimise the technological investment. The gross floor area of the storage and its height are dimensioned to guarantee at least the minimum capacity indicated. Designers must provide that the architectural module of the building intended to house the storage is suitable for housing the infrastructure (stocking, handling and conveyancing structures,

security systems, technical rooms, etc.), which will be the subject of separate and subsequent design and supply.
For this purpose, the following indications are provided:

- dimensions of bibliographic material storage boxes: 60x40x30 cm
- estimated capacity (bibliographic units) per box: 30 units
- dimensions of loading unit: 60x40x35 cm
- number of automatic lines: min. 4, max. 8, which may be implemented subsequently
- total picking speed: 200 boxes/hour picked.

The conveyor system must be designed for the delivery of the requested materials near the librarians' desks in the following areas:

Reception and first information area	1 pick-up point
B.E.I.C. Forum	1 pick-up point
Departments	1 pick-up point
Conservation office and restoration laboratory	1 pick-up point
Offices for the reception and processing of documentary material	1 pick-up point

A "buffer" space must be provided near each pick-up point to allow staff to hold the following loading units on site.

Reception and first information area	5 loading units
B.E.I.C. Forum	5 loading units
Departments	10 loading units
Conservation office and restoration laboratory	10 loading units
Offices for the reception and processing of documentary material	10 loading units

The storage is also directly connected, by means of automatic conveying systems, to the areas where the book return devices are located, so that the returned works are automatically conveyed to the storage.
The storage must be protected from natural light and adequately sealed to allow the creation of a modified atmosphere (oxygen depleted) that provides adequate fire protection and slight overpressure to reduce dust penetration; the temperature and humidity in the space must be constant (20-22°C and 45-55% relative humidity, respectively) to ensure optimal preservation conditions.

QUANTITATIVE PROGRAMME

Units	**Reference specifications**	**Sizing**
AUTOMATED CENTRAL STORAGE		
H.1 - Automated central storage		
minimum capacity	no. of documentary units	2,500,000

Designers are invited to take into account the initial massive loading, which will take place with bulky vehicles, such as articulated lorries. For the first months of functioning of the library, adequate space for logistics (loading/unloading operations) will have to be provided, which will be used to park the vehicles near the building. Then the material will be placed in a temporary indoor area waiting for the robot loading bays to check in. Once the material has been transferred inside the building, the areas can be used for other functions (green area, parking area, etc.). This will take place between the testing phase of the work and its handover to the managing subject.

I - INTERNAL SERVICES

Internal services include the technical rooms, the internal working spaces, and the service parking areas.
The service parking areas must be accessible from Viale Molise or Via Monte Ortigara and must accommodate no. 2 bibliobuses (length: 8.5 m; width: 2.5 m) no. 3 service vehicles, no. 3 vans, no. 8 cars, and no. 5 motorbikes. In addition, there must be the possibility of parking and loading/unloading goods for suppliers (also of commercial spaces) and maintenance workers, who will transport materials using specific routes which will be protected and separated from those areas open to the public.
The following offices and rooms dedicated to the management and processing of bibliographic materials, for a total of no. 40 equipped workstations, must be close to and possibly on the same level as the parking areas to facilitate loading and unloading operations:

- bibliobus storage;
- storage of consumables. Room equipped with industrial racks and cabinets;
- furniture and tool storage. Room equipped with work desk and tools for small repairs, cabinets;
- storage for incoming and outgoing volumes. Room equipped with racks and cabinets;
- incoming administrative controls, physical processing of documentary materials. Open space with shared desk;
- cataloguing office. Open space with shared desk and racks;
- conservation office. Open space with shared desk and racks;
- purchasing office. Open space with shared desk;
- bookbinding laboratory for minor maintenance work. Equipped room.

The other offices and support rooms for the staff, who carries out administrative activities, should be located in the building without any particular constraints, as long as they are grouped in a single area.

Technical rooms include systems and machinery. At least the electrical cabin and the solid waste storage room must be placed at street level.

QUANTITATIVE PROGRAMME

Units	Reference specifications	Sizing
INTERNAL SERVICES		
I.1 - Logistics and document management		
logistics	bibliobus collection storage, organised with 6-post racks or compactable racks. no. of document units	 20,000
logistics	storage of consumables. Room equipped with industrial racks and cabinets	1
logistics	storage of furniture and equipment. Room equipped with work table and tools for small repairs, cabinets, etc.	1
document management	storage of incoming and outgoing volumes. Room equipped with racks and cabinets, accessible from the service vehicle parking area: boxes arriving from suppliers and boxes leaving for the library are stored here; interlibrary loan boxes are also sorted and prepared. no. of boxes/cases in transit no. of document units on racks	 200 5,000
document management	bibliobus office no. 1 closed office + open space with shared desk no. of employees	 5
document management	incoming administrative controls, physical processing no. 1 open space with shared desk no. of employees	 8
document management	cataloguing office no. 1 open space with shared desk no. of employees	 8
document management	purchasing office no. 1 open space with shared desk no. of employees	 7
document management	conservation office no. 1 open space with shared desk no. of employees	 4
document management	bookbinding laboratory for minor maintenance and restoration work. Equipped room. no. of employees	 2
administration	administrative management office. no. 1 open space with shared desk no. of employees	 8
IT	technology equipment management, data management no. 1 open space with shared desk no. employees	 5
marketing and communication	marketing, communication, fundraising, external relations no. 1 open space with shared desk no. of employees	 14
direction, secretariat, apical functions	no. of individual offices	10

innovation and development	management of special projects, planning of cultural activities, library cooperation no. 1 open space with shared desk no. of employees	 10
meeting rooms	meeting rooms for 5, 10 and 20 people no. of seats	 40
relax and support rooms	room with kitchen and relax areas no. of seats	 30
storage and support rooms	no. of storage, archive and support rooms	4
toilets and service rooms (indicative quantification)	no. of users	10
I.2 - Technical spaces and rooms for systems		
spaces for systems and machinery	to be sized according to the project	
I.3 - Parking areas		
service parking spaces for employees, disabled people, motorbikes and bicycles	no. of car parking places no. of motorbike parking places no. of places for bicycles	8 5 60
logistics support parking spaces	no. of service vehicles no. of bibliobus (length: 8.5 m; width: 2.5 m) no. of supplier vehicles (e.g. “Ducato” type vans)	3 2 3
waste rooms and recycling rooms	to be sized according to current regulations	

Below a description (fig. 20) is provided for a better understanding of the relation between the various functions. This chart does not necessarily have to coincide with the competitors’ project proposal.

fig. 20
Diagram with the relations among functions.

independent access from outside
connections among functional units
anti-shoplifting barriers

ENTRANCE HALL
atrium promenade
guard booth security staff
book return stations
cloakroom
pop-up stores
bookshop
foyer
cloakroom
toilets
caffetteria bistrot
AUDITORIUM
dressing rooms
storage
auditorium
translation booths
control room
IMAGINARIUM
green area
toilets
reception
parents space
"imagine and create" space
educational robotics laboratory
"grow and learn" space
coding laboratory
"discover and play" space
"parents and babies" space
reading and drama space
exhibition space
space for installations
reception counter
self-check area
reception and first information
service rooms
toilets
magazines and newspapers
news, current affairs and thematic proposal
exhibition space
BEIC FORUM
reception
toilets
music, entertainment gaming and new media
storage
gaming arena
video room
Hi-End listening room
box podcast / self recording
recording room
box VR
laboratories
storage
fablab
coworking
radio-tv station
multipurpose rooms
exhition space
storage
INTERNAL SERVICES
offices
individual offices
administrative management office
technology equipment management office
marketing, communication, fundraising and external relations office
special projects management office, etc.
toilets
storage
meeting rooms
relax spaces
systems rooms
waste rooms
DEPARTMENTS
storage
reception
consultation room
science and technology dept.
humanities and social sciences dept.
arts and literature dept.
toilets
toilets
toilets
H24 study rooms
toilets
terrace
panoramic room
digitalisation of book, manuscripts and 2D graphics
DIGITAL DEPARTMENT
centro digitalizzazione
acceptance control deposit
archive
special projects rooms
data processing centre
audio and video digitalisation
toilets
store room
collaborative projects spaces
creative laboratory
innovation lab
VR Lab
Robo Lab
AI & Machine Learning Lab
parking areas
logistics and document management
bookbinding laboratory
bibliobus collection storage
consumables storage
forniture and equipment storage
incoming and outcoming volumes storage
incoming administrative controls
cataloguing office
purchasing office
conservation office
AUTOMATED CENTRAL STORAGE

4.5 IDENTITY AND RELATIONS WITH THE CONTEXT

The building may have more than one above-ground floor (in compliance with the airport constraint, as in paragraph 3.5), while any underground floors shall be developed considering the presence of Passante Ferroviario tunnels, in accordance with the provisions of paragraph 3.3.
It is permissible to divide the project into several volumes/pavilions, ensuring that there are indoor connections between them. At any rate, the management impact of the proposed solution must be considered.
From an architectural point of view, the building should have strong recognizability and identity, making it a landmark not only for the neighbourhood but more generally for the whole city.
The *Nuova B.E.I.C.* shall be clearly visible from the adjacent streets, from those arriving on foot, by bicycle, car or public transport. The building shall be permeable. The various parts of the building, as well as the routes, should be easily identifiable, so as to facilitate access, movement and orientation of the users. Particular attention should be paid to the external routes connecting with the accesses of the Passante Ferroviario (figs. 21 and 22), with the surrounding residential area and the surrounding areas undergoing transformation (the new district planned in the Ex Macello area and the new park, under construction between Viale Umbria and Via Cervignano). It will also be necessary to evaluate the possibility of integrating the access to the Passante Ferroviario on the west side of Viale Molise into the *Nuova B.E.I.C.* project, within Area 1: this access can be maintained in its current conformation or rethought, creating a direct connection with the library. In the latter case, the intervention will have to be approved by RFI.
The new library should look like an open, comfortable, and culturally alive place, whose purpose is to promote the meeting of people, the exchange of ideas, learning, and creativity.
Particular attention should be paid to the continuity and integration

fig. 21
Access to the Passante along Via Cervignano.

fig. 22
Access to the Passante along Viale Molise, in Area 1.

of the internal spaces and external spaces of the building. The "inside/outside" relationship can be translated into a series of architectural choices, like emphasizing the transparency or permeability of some parts to allow a partial view of the internal spaces and activities, creating "hybrid spaces" whose functions can be carried out partly inside and partly outside.
It will be possible to envisage a pedestrian crossing of the building complex by occasional passers-by, who will find themselves immersed in the new building activities while remaining external spectators. It will be necessary to combine aspects of "closure and discretion", necessary to guarantee the functionality of the building, with principles of "permeability and crossing", essential for the context in which the new library fits.
The "green", as a fundamental principle of design, should be considered as an element of integration and continuity of the building with the urban context and can penetrate inside the built space or be "incorporated" using green roofs.

4.6 BUILDING LIFE CYCLE AND CONSTRUCTION CHOICES

Considering the need to design by adopting highly energy-efficient solutions with a view to minimizing 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;
- minimizing the distance of supply of construction products in order to stimulate the circular economy.

The project proposal must consider the Minimum Environmental Criteria (C.A.M.), approved by the 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 C.A.M., the proposal may use national and international energy and environmental sustainability protocols for buildings (rating systems).
Works relating to construction, structure and systems (electrical, mechanical, fire-fighting and special installations) must also comply with:

- prescriptions that will be given by the Fire Prevention project, which must be developed prior to the start of the final design activities and must be approved before the start of the executive design activities in order to incorporate any additional requirements that

may be given by the Fire Service Command;
- Lombardy Region requirements of D.D.U.O. n. 18546 of 18/12/2019 and of the sustainability protocol that will be adopted;
- Lombardy Region prescriptions of R.R. n. 7 of 23/11/2017 regarding hydraulic invariance.

In general, the following design aspects should be considered in the intervention design to ensure adequate levels of indoor environmental quality, such as:
- natural lighting and optimization of solar inputs;
- 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 minimize the environmental impact, particularly during the construction phase, it is requested to favor off-site works, e.g. prefabrication.
The use of BIM, able to facilitates the industrialization 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 systems are key factors in ensuring the efficiency of the project.

4.7 MATERIALS AND FINISHES

Materials should be high quality, durable and functional. For example, when determining the glazed surfaces, both the functional and aesthetic value, the technological implications on the control of the internal climate (plant and energy costs), and the management and maintenance costs should be carefully evaluated. The designer should specify the materials he intends to use for the various parts of the building, focusing on construction technologies in relation to construction time, durability, environmental sustainability and maintenance. In this regard, cleaning and maintenance requirements, both internal and external should be carefully considered in such a way to keep the building "as good as new" for a long time, discouraging acts of vandalism.
The new library, through a careful choice of materials, finishes, colours and other characteristics of the surfaces (reflection/absorption of light and sound, durability, resistance to wear, etc.), will have to be designed in such a way as to reinforce the perception of the safety of the building and of the surrounding spaces, also in function of the opening and closing hours of the service.

The designer will have to identify the most suitable materials for the various spaces, assessing both the aesthetic and functional value, considering the characteristics of the materials themselves and their optimal use within the building to guarantee a high level of comfort for both users and workers.

4.8 FITTINGS AND FURNISHINGS

As well as the architectural project, the competitor is required to define the project for the fittings for the new library. Within the Economic Framework for the realization of the work, a sum has been allocated for the design of both standard and custom furnishings. It will be up to the designer to decide whether to opt for standard furnishings or design "ad hoc" elements for certain library spaces, taking into account what is specified below. Specifically, the share of custom-made furnishings must not exceed 20% of the total intended for fittings. The furnishings should constitute an added value of the project and contribute to a more organic definition of the space and the different functions envisaged. The lighting proposal will also be part of the furniture, aimed at ensuring not only the correct amount of light, but also to improve the internal atmosphere of the library by identifying the correct degree of lighting of the various areas.

4.8.1 GENERAL CHARACTERISTICS AND REQUIREMENTS

The layout of the interior spaces must be designed with the aim of creating modern, welcoming, airy environments, functional to the different uses of the areas that make up the library. Competitors will have to draw up a design proposal taking into account the following design principles.

• Flexibility and modularity
Many areas of the library are characterized by an extremely flexible and multiple use of environments. In particular, this feature concerns the entrance area, the B.E.I.C. Forum and the Imaginarium. These spaces must be easily and quickly transformable and reconfigurable to adapt to the many initiatives hosted or the changing needs of users over time, because the library must evolve with the needs of the city. All the solutions proposed must therefore be consistent with this need. Therefore, robust but lightweight furnishing solutions are required, easy to move and store in storage areas, which allow spaces to be completely redesigned if necessary: for example, mobile structures on wheels, stackable chairs, reading surfaces that can be combined to adapt to different reading and study methods

(individual or group reading or studying). These characteristics are also required for custom-made elements, designed by competitors.
Both standard and custom-designed furnishings must comply with a principle of modularity to allow for their assembly and disassembly, in order to relocate them in environments of different sizes and/or shapes.

• Aesthetic quality and hospitality

To truly become a central place in the life of citizens, the *Nuova B.E.I.C.* will have to offer attractive and comfortable spaces: places where it is pleasant to go and entertain, able to stimulate creativity and interest in the different languages of culture and human expression, prepare for the exchange of experiences and learning, be places of inspiration for everyone.
From this point of view, furnishings play a fundamental role. It is important that they contribute to creating informal, hospitable environments, capable of generating surprise and that they are suitable for the various targets for which they are intended (this aspect is even more important for the younger audience). Where compatible with the intended functions, it is important that the proposed solutions encourage interactivity and interpersonal exchange.
To achieve this goal, competitors can propose the use of design elements or, on the contrary, use unusual and unconventional shapes, created both by using series products and, where applicable, custom-designed and site-specific solutions.
Accessories must also be particularly detailed and of high quality: they must all be characterized by an adequate design, in harmony with the environments and the proposed furnishings, and be produced with resistant materials of excellent aesthetic quality.

• Furniture compatibility with technological components

Although the winner will not be commissioned to define the project of the IT and digital equipment, it is required that the proposed furnishing solutions are selected taking into account the need to accommodate or match the equipment indicated in the functional description of the various areas of the library. For example, all study stations must be equipped to allow users to connect their devices to the power grid; all PC consultation stations (standing or desk) must be wired and suitable for housing PCs, monitors, keyboards and mice; gaming stations must take into account the need to house and connect the console, controllers and a large format monitor to the network; all multi-purpose rooms must be set up for projection and audio dissemination, etc. The design of the auditorium must, however, detail all the technological equipment provided.

• Accessibility

As has already been pointed out, all the internal areas of the library must be easily accessible to everyone, regardless of their abilities. More specifically, the following are some of the requirements that competitors must comply with:

- access to the library must be easily identifiable from the outside and must be clearly visible from the street and in the distance. The entrance and exit must be equipped with automatic doors, such as to be easily openable even by disabled users or users with temporarily limited movements (people with a stroller, with their hands occupied, etc.);
- the doors or access gates of each room must be easily manoeuvrable, with a net width such as to allow easy transit even by a person in a wheelchair (not less than 80 cm); the compartment of the door and the front and rear spaces must be coplanar and sized to allow easy manoeuvring with the wheelchair;
- the doors, windows and French windows must be easily usable even by people with reduced or impaired motor or sensory capabilities, as well as opening mechanisms. It would be desirable for the parapets and windows to also allow seated persons to see, while guaranteeing the safety requirements and protection from falling outwards;
- the terminals of the systems (switches, sockets, etc.) must be prepared for easy use even by people with reduced motor and sensory capacity;
- every floor of the building must include toilets accessible also to disabled people equipped in such a way as to allow the necessary manoeuvres for the use of sanitary equipment also for people in wheelchairs;
- the steps of the stairs must have a non-slip, rectangular tread. The handrails will be easy to grasp and made of durable, non-sharp material. The length of the ramps will be interrupted by appropriate landings;
- the layout of the fixed furniture in the different environments must be such as to allow for the passage of people on a wheelchair and their easy use of the equipment contained therein;
- it is necessary to ensure that study and consultation tables can be easily combined with wheelchairs;
- partitions on the front of the counter should be avoided, so as to allow for easier reception of disabled people and children;
- the internal signs must be easy to read and understand, using icons and typefaces that can be more easily understood even by people with dyslexia;
- sensory pathways for the visually impaired and blind and adequate horizontal and vertical signage must be provided. Competitors will have to consider the possibility of preparing tactile maps to

allow for orientation in the building even to people with visual or sensory impairments. These paths, in addition to being useful for people with visual disabilities, must be designed to have an educational value for all users;
- the relevant open spaces must also be equipped by creating areas where the games are suitable for all children.

• Colour

Particular attention must be paid to the choice of colours of the various furnishing elements and to their harmonisation in the context in which they are inserted. To this end, the competitors in the competition phase will have to propose solutions that will be refined and made definitive in the subsequent design phases.
In general, the areas intended for children must be more colourful and livelier; the teenagers' area must also be marked chromatically as different, 'other' compared to the area intended for children.

4.8.2 SPECIFIC CHARACTERISTICS OF CERTAIN AREAS OF THE NUOVA B.E.I.C.

Some specific indications are provided for the preparation of the following areas of the library.

• Imaginarium

The space to be designed must be particularly surprising and able to attract the little ones. The areas inside this section are set up with different furnishing solutions according to the intended destination. More specifically:
- in the "Parents and babies" space (0-2/3 years) and in the "Discover and play" space (3-5/6 years) the shapes and colours of all the elements must be attractive, favouring surprise and playfulness. Soft furnishings, breastfeeding chairs, platforms, shelves and/or low displays are required in this area, that are easily accessible, suitable for exhibiting books often characterized by non-standard formats and sizes. Seats and tables should favour playfulness: they can be inspired by elements of nature, or recall shapes and objects of the child's imagination, or allow children to hide (houses, curtains, soft seats obtained inside the shelves, etc.). The presence of adult companions must be provided, to be accommodated on informal chairs;
- in the "Grow and learn" space (6-9 years), both the needs of informal reading must be balanced, with comfortable reading areas on the ground, on ottomans or beanbags, and the possibility of reading and doing homework on tables and chairs of adequate size and height. Documents for ages 6-7 and 8-10 require separate placements;

- in the “Imagine and create” space (10-13 years) it is necessary to create a stylistically distinct environment with respect to the areas intended for children. Sociality and the possibility of studying as a group should be encouraged.

All furnishings must be easy to maintain and made of washable material.

• B.E.I.C. Forum

The B.E.I.C. Forum, the laboratory and experiential space of the library, will have to be configured above all as a place of aggregation, creativity and direct experimentation. In this section there must be the possibility to consult books, comics, music, videos, internet and multimedia, create discussion and reading groups, also perform various creative and laboratory activities, related to the world of storytelling, writing, graphics, cinema, music, digital technologies and gaming.

This area will have to be informal and friendly, as removed as possible from a school environment in the collective youth imagination.

• Multi-purpose rooms

The multi-purpose rooms of the B.E.I.C. Forum will be used by a general public, with a predictable prevalence of youth groups. Therefore, they will have to be prepared and equipped to organize both more traditional activities (workshops, courses, conferences, book presentations, small events) and innovative functions, focused on creativity and multimedia, providing for the possibility of working both individually and collaboratively, in groups of various sizes, through table chairs that can be combined depending on the needs. The possibility to recombine these spaces is a fundamental requirement.

• Outdoor equipped spaces

The pertinent spaces of the B.E.I.C. must be conceived as an ideal continuation of the library outside: a “library in the green”, where you can stay, read, study, meet or attend small events and activities. It is desirable that the cafeteria – bistrot has a dehor to be set up in the months when the weather conditions allow it.

In the relevant outdoor spaces, near the Imaginarium section, the games must be suitable for all children.

Fixed outdoor furnishing solutions must combine aesthetic pleasantness and characteristics of robustness, resistance and ease of maintenance.

4.8.3 FURNISHINGS

Competitors will have to propose furnishing solutions to make the B.E.I.C. an informal and attractive space. In preparing the proposed internal layout of the library, standard furnishings may be used, favouring design products designed to be placed in public spaces (ergonomic, robust and durable), and custom-designed furnishings, to a maximum of 20% of the total value of the supply.

• General requirements

The basic requirements for furnishing components must be as follows:

- ergonomics and functionality for the intended use;
- duration;
- resistance to wear and tear;
- aesthetic quality;
- quality of materials and finishes (with particular attention to construction details and thicknesses);
- easy cleaning and maintenance;
- modularity;
- ease of handling, assembly and disassembly;
- ease of storage;
- integration and interchangeability of components and accessories

Moreover, compliance with the following provisions is required:

- minimum environmental criteria for interior furnishings referred to in Annex 1 of the Ministerial Decree of 11/01/2017;
- national and European standards, UNI, ISO and EC, relating to stability, structural strength, bending of the planes, maximum total load tests, fatigue strength of the structure, impact tests and general safety requirements;
- legislation on accident prevention and on the protection of health and safety at work;
- regulations on fire prevention. In particular, with regard to the latter, the competitors will have to bear in mind from the competition phase that all the proposed armchairs and upholstered furniture must be compulsorily in class 1 IM of reaction to fire with approval of the Italian Ministry of the Interior pursuant to the Ministerial Decree of 26/06/1984 or, if made to measure or coming from the foreign market, of equivalent certifications certifying the fireproof characteristics of coatings and padding, such as to be accepted by the competent Fire Service Command. Unpadded seats made of combustible materials and other furnishing elements (standard or custom-made) may be in reaction to fire class 1 or lower, based on the instructions that will be given to the designers by the Fire Service;
- wood chipboard panels with wood veneer must be fire-retardant

painted, with transparent paint;
- furnishings and wooden elements must be fireproof painted, as per Ministerial Decree of 06/03/1992;
- wood and wood-based materials must be obtained from wood from legal sources. All parts of solid wood, plywood, chipboard and melamine panels that will be used for the construction of custom-made furnishings, must come from woods and forests where sustainable certified management is implemented or must be produced with the use of 100% recycled wood or with a combination of both;
- the recycled wood, when used for the production of the wood-based panels constituting the finished product, must not contain pollutants in quantities greater than that specified in the Ministerial Decree of 11/01/2017.

• How to display the collections

The book, periodical and audiovisual collections located in the sections directly accessible to the public are placed on the shelves as follows:

- books
  - flat: in this case it is calculated that 5 pieces per linear meter can be displayed;
  - mixed (flat and spine on the same shelf): in this case it is calculated that on average 25 pieces per linear metre can be placed on shelves with 6 shelves (4 shelves spine and 2 flat) and 23 pieces per linear metre on shelves with 5 shelves (3 shelves spine and 2 flat);
  - spine: in this case it is calculated that 35 pieces can be placed per linear metre.
- audiovisual
  - flat: in this case it is calculated that 7 pieces per linear meter (CD – DVD) or 3 pieces (LP) can be displayed;
  - mixed (flat and spine on the same shelf): in this case it is calculated that on average 52 pieces per linear metre can be placed on shelves with 6 shelves (4 shelves spine and 2 flat) and 48 pieces per linear metre on shelves with 5 shelves (3 shelves spine and 2 flat);
  - spine: in this case it is calculated that 75 pieces can be placed per linear meter (audio CDs and/or DVDs).
- periodicals
  - magazines and newspapers are displayed on shelves with tilted flap and back compartment for past issues.

4.8.4 FUNCTIONAL CHARACTERISTICS OF SOME TYPES OF FURNISHINGS

With regard to the arrangement of the collections in the open shelf areas, the use of library shelves is prescribed, with the characteristics described below.
On the contrary, the exhibition solutions identified for books and objects belonging to the special collections must allow an attractive presentation, especially where they are intended for the creation of exhibitions.

• Shelves accessible to the public
In the reception area, news and first information, the single-sided wall shelves must have no more than 6 shelves with a top shelf height of approx. 180-185 cm and height of the lower shelf not less than 15-20 cm from the ground. The double-sided self-supporting shelves should be on wheels, with no more than 5 shelves, with a maximum top shelf height of approx. 150-155 cm from the ground, and height of the lower shelf not less than 15-20 cm.
In the departments, the single-sided and double-sided self-supporting shelves must have no more than 6 shelves with a top shelf height of approx. 180-185 cm and height of the lower shelf not less than 15-20 cm from the ground.
In the Imaginarium, the double-sided shelves must be on wheels, with no more than 4 shelves (height of the top shelf approx. 120 cm above the ground).
In the Children's Area, boxes and baskets should be preferred.
In general, the shelves must be characterized by maximum flexibility and modularity: the shelves proposed must be autonomous and easily movable. They must be adaptable and modifiable (flexibility of the position of the shelves, interchangeability of the supports to accommodate different types of documents in the same type of shelf, adjustable feet to cope with irregularities of the floor, etc.), must be assembled with side connection systems to set up continuous rows or fenced "rooms" and should be accompanied by signage and lighting systems.
All shelves must be mobile, easily movable without the need to use any tool, but simply interlocking. The shelves must be equipped with a rear lip, and all must be tiltable by simply turning and flipping the shelf, using the appropriate supports.
The net depth of the box must be 25 cm. To allow for the positioning of larger volumes, a part of the shelves may be without the back lip so as to allow out-of-size books to protrude at the back.
The shoulders of the shelves and any visible backrests must be equipped to be able to attach standard accessories (displays, signs, shelves, etc.).

The proposed shelves must be equipped with the following complementary elements and accessories as standard:

- inclined shelves for display with the lower side folded to support the document;
- special compartmentalized containers and shelves for the storage and display of special documents (comics, maps, documents on optical or magnetic media, etc.);
- consultation tops of various sizes: cantilever extractables, fixed with support on the ground, for standing (approx. 100-110 cm from the ground) or sitting consultation, incorporated in the space of the shelves or placed laterally on the shoulders of the shelving;
- display or shielding panels;
- book supports: sliding in grooves under the shelf above; corner hooked onto the edge of the shelf; lateral hooked onto the uprights;
- signage elements: side panels (to be placed on the shoulders of the shelves); flag panels (to be installed on the top of the shelves); plates (interlocking or magnetic to be applied on the front edges of the shelves); self-supporting blocks to be inserted between the books (in wood or plastic, with plates and inscriptions).

All elements must have rounded edges, no sharp edges or sharp profiles, no protruding bolt or screw heads or attachments, dangerous to users and books.

The finishing treatment must guarantee durability and resistance to wear and time (including the chromatic inalterability of the surfaces). Materials (in particular glues and paints) must not emit gases or harmful substances or emit toxic gases by combustion and must withstand chemical (cleaning, etc.), thermal (expansion and withdrawal) and hygrometric (humidity) agents.

From the point of view of loads, each shelf must support at least 100 kg per linear metre, with an elastic deformation not exceeding 3 mm at the central point.

Metal surfaces must be adequately treated against rust (phosphation) and enamelled with paints based on thermosetting epoxy powders, scratch-resistant and with colour unalterable by light.

• Counters

The counters must consist of modular, linear and curvilinear elements, with a continuous plane and front panelling. The counter modules can have a variable height depending on the type of activity to be carried out and must be adequately equipped both for systems and for furnishing equipment (drawers, trolleys, supports for IT equipment, shelves for books and documents, etc.), in order to respond effectively to the needs of the librarians who work there and those of the users who access them.

The modules can incorporate a wide range of elements and

accessories, including: containers with drawers or doors (to be incorporated into the cabinet, or to be left on wheels and to be inserted under the counter); modules of various kinds and of different sizes; displays, counter tops and shelves; hardware equipment (CPU units under the counter, scanners above the counter, printers, RFID staff stations etc.); artificial lighting.
Panels on the counter should be avoided, so as to allow for easier reception of disabled people and children. A part of the counter can be higher on the side of the public and lower on the side of employees, so as to provide support to standing users and better circumscribe a part of the staff's work surface (where small printers or other equipment can be hidden from view). The counters should also be easily accessible by a wheelchair, and in the reference stations users should be allowed to sit adjacent to the librarian.
The staff stations distributed in the various areas of the library do not need real counters, but a station equipped and made clearly visible also thanks to the use of special signs, which allows librarians to be in the areas where the public carries out the various activities, without forcing users to go to the counter in case of need.

4.8.5 LIGHTING

Lighting (natural and artificial) is one of the aspects that most influences the perception of quality of the environments both from the functional point of view and of visual comfort, and from the aesthetic point of view and of environmental comfort.
The daylighting project must allow for the achievement of lighting values appropriate to the visual performance required to carry out the specific activities of the spaces in which the library is articulated. In particular, spaces intended for reading and consultation must benefit mainly from natural lighting, as well as most of the spaces in the Reception Area, the Children's Area and the offices, while in closed warehouses only artificial lighting is required.

4.8.6 ACOUSTIC QUALITY

For the purposes of acoustic well-being, competitors must provide appropriate measures for the reduction of noise of an aerial nature (from the outside and produced inside the building) or caused by impact (trampling, falling objects, etc.), in order to achieve a maximum sound level in each environment, appropriate to the activities carried out there.
The library rooms, with functions such as to determine distinctly different acoustic climates, must be adequately separated: for

example, confined spaces intended for noisy activities (atrium, loan area, auditorium, conference rooms, equipped rooms, rooms for vision and listening groups, commercial and refreshment activities) must be separated from adjacent rooms with soundproof partition walls or by interposing "buffer" areas between them.
All floors above living spaces must be protected against the transmission of footfall noise, adopting constructive measures to avoid the transmission of all impact noise.

4.8.7 SIGNAGE

The winners of the competition will have to process the visual identity of the *Nuova B.E.I.C.* (internal directional signs, maps, routes, signs on the shelf, lettering, digital signage, etc.) as an integral part of the set-up. The project will have to take into account the need for autonomous orientation also by people with visual and sensory limitations and will be able to use projection technologies to ensure maximum flexibility and adaptability of messages to the needs of the library.

4.9 SYSTEMS

The building must be designed to achieve high standards of environmental and energy sustainability, thanks to the adoption of constructive and technological solutions capable of minimising its environmental impact in terms of the resources required and in relation to the site affected by the intervention.
On the energy consumption side, the building will have to be designed as a Nearly Zero Energy Building (N.Z.E.B.), for this reason, the design solutions will be aimed both at reducing and optimising the demand for resources, in particular renewable ones, and at ensuring the best levels of environmental comfort for future occupants.
On the management level, the spaces must embrace a completely data-driven management philosophy, i.e. , they must be prepared with sensors and devices to allow for a systematic and continuous collection of data, which properly processed and interpreted will constitute a support system for management and decisions. But the users themselves will be data producers, which will be collected as part of their multiple interactions with the spaces, services and available tools.
The systems supplied with the building, respecting the regulatory constraints related to functional and operational safety, can constitute an added value for the construction of the new complex.
All systems (electrical, mechanical, fire-fighting, special) must comply

with the requirements that will be given by the Fire Prevention project, which must be developed in preparation for the start of the design activities and must be approved before the start of the executive design activity.
The main design criteria that the designers are called upon to follow will be:

Electrical systems

Power supply and connection to grid systems
For being connected to public networks, the building must be equipped with only one energy supply for each type of system. The supplies must be made according to the indications provided by the public network operators.
The supply must take place through delivery in Medium Voltage in a dedicated user cabin that must be placed inside the lot, following the instructions of the Unareti manager such as positioning and geographical location (access on the public street side). Any locations of the user cabin inside the building must be adequately shielded to mitigate the risk of exposure to electromagnetic fields.

Motive power distribution and lighting systems
The environments subject to design must be classified, in accordance with current legislation, to define the protection measures against direct and indirect contacts, which are provided for by current technical legislation and in particular by the CEI 64-8;2021 standard. Connections to the operator's networks must be made in accordance with the Unareti requirements and the CEI 0-16 standard. An earthing system must be provided according to the CEI 64-12;2019 standard and the requirements of the report on the risk of lightning strike of the structure must be adopted, which must be developed at the same time as the earthing system design.
Electrical systems must be designed with area architecture, where "area" means environments and spaces with the same intended use, that is functional. The individual areas must be equipped with separate protections on different circuits and subdivided, for example, into light circuits and terminal power outlets. The plan surface of the areas must be adapted to the project. The distribution of energy must be designed to guarantee the maintainability of the system, after its construction, allowing safe access to all the components of the system itself. In order to guarantee the resilience of the system. the terminal circuits must meet the criteria for the division of utilities functional both to the activity and to minimising disruptions in the event of failure or malfunction.
The lighting systems, to be adopted for the lighting of environments, must be identified using criteria and solutions to reduce energy

consumption by allowing for use of natural lighting, within the constraints of the architectural project. The lighting requirements, in ordinary as well as in safety operation, must comply with current technical regulations. The design of safety lighting must, in particular, consider the presence of emergency lighting in all the areas of the building that contain devices on which it is necessary, or possible, to perform operations for the restoration of normal operating conditions.
The lighting system must guarantee the lighting levels provided by the UNI EN 12464-1 standard, for indoor environments, and by the UNI EN 12464-2 standard, for outdoor environments, both in ordinary and emergency conditions with the adoption of stage lighting to highlight the external façades of the building and furnishings for the relevant outdoor areas.
All light fixtures must comply with the Ministerial Decree on C.A.M. and the sustainability protocol that will be adopted.
An emergency lighting system must also be provided in accordance with UNI 1838 and the requirements of the fire prevention project.
UPS/CPSS must be provided for the absolute continuity of the safety systems of the building suitably sized and positioned in a dedicated technical room that must have the appropriate extractions and ventilation according to the actual load to which they will be dedicated.
In addition to that, given the growing sensitivity of citizens towards electric mobility, competitors will have to evaluate the possibility of placing charging stations for electric bicycles.

FER systems
The structure must be equipped, as indicated by current legislation, with energy production plants powered by renewable sources with the minimum size that will be defined by the energy design and compliant with the D.D.U.O. (Organisation Unit Director Decree) no. 18546 of 18/12/2019 of the Lombardy Region and/or by the sustainability protocol that will be adopted. Given their typical location on the roof, these systems must guarantee the possibility of carrying out maintenance interventions and operational checks. In particular, the installation sites of the systems must have the characteristics required for the workplaces and must be safely accessible by the operators.
The systems must comply with the CEI 82-25 standard and the requirements of the fire prevention project.

Special systems

Structured wiring system serving special systems
The purpose of the structured cabling system serving the special

systems is to collect all the signals and information deriving from the components of the special systems in the field and to make them available to the local supervision and control system, at the operator station that will be identified within the building and which will have the function of control centre, and to the remote one, at the supervisory and control points of the Administration.
The architecture of the structured wiring system must consist of a main rack, located in the technical room, the so-called "star centre" of reference, inside a dedicated room. The rack must be inserted inside the Administration's ring data structure (the so-called "campus network"): the connection to this ring, of the in-out type, must be made of high performance OS2 single-mode optical fibre.
The network will be physically separated from the ICT network through the adoption of dedicated racks to ensure a high degree of security and reliability and to prevent intrusions from the outside as it is exclusively local and interfaced with the "campus" network of the Administration through a dedicated VPN.
The main rack will then give rise to a ring inside the building, always made of high performance OS2 single-mode optical fibre, which connects the secondary racks, called satellites, located on the various floors.
Active devices (star centre switch, floor switch and access point) must be provided to allow the immediate provision of connectivity services.

Structured ICT wiring system
The complex must be equipped with a capillary ICT infrastructure to allow for the provision of the necessary connectivity services.
The infrastructure provided inside will have to be structured to distribute the necessary carriers to fixed (fibre and copper), mobile and Wi-Fi ICT services.
The architecture of the system is similar to that of the structured wiring system serving special systems.
This system has the purpose of making available multifunctional spaces and office rooms, a suitable number of data sockets for the network connection of the equipment; in addition, there are service data sockets within the technical rooms.
Both inside the building and in the external area of the courtyard, there must be a capillary Wi-Fi coverage thanks to the installation of various access points arranged in triangulation.
Active devices (star centre switch, floor switch and access point) must be provided to allow for the immediate provision of connectivity services.

BMS system
The building must be equipped with a BMS system with which it will be possible to monitor, control and regulate the systems even remotely, thus ensuring maximum control of the comfort conditions

inside the building and, at the same time, define and monitor the implementation of energy management strategies and reduction of operating costs thanks to the availability of updated information in real time. The Building Management System (BMS) will allow for innovative ways of automation, management and remote control of plants. It consists of a hardware part, based on field sensors that command and control the correct operation of the systems, and a software part based on a supervision platform that monitors and optimises energy consumption in real time, allowing the adjustment of the parameters also through the application of artificial intelligence algorithms.
The systems must be based on standard protocols and must guarantee real-time supervision and control, by way of example but not limited to, of the following systems:

- thermo-mechanical systems and air conditioning control system;
- electrical fault control system (protection intervention);
- elevator control system;
- integration of thermal energy accounting systems;
- integration of electricity consumption monitoring systems;
- integration of lighting equipment management;
- integration and supervision of special systems;
- integration and supervision of fire-fighting systems;
- HVAC system adjustment.

Fire detection system

The architecture of the fire detection system must consist of one or more power plants that will be positioned within the main technical room that will be identified. The coverage of the system must comply with UNI 9795-2021 and, in general, with the requirements of the fire prevention project.
The control unit must be connected via UTP cable to the structured wiring system serving the special systems and to the supervision system, to which alarms, fault or malfunction signals will be communicated. An alarm repetition and management panel must be provided in the control centre that will be identified for emergency management.
The control unit will also have an IP-Ethernet interface that will interface with the special system's network and that will allow, through the installed supervision PC, for the supervision of all the components of the system on a dedicated graphical map.
The plant will be connected to the automatic fire extinguishing systems for their activation in the event of an alarm and must guarantee all the functions provided for by the regulations on the systems, including the control of the mechanical systems for their stopping in the event of a fire, for the lifts, for the REI fire doors through magnets, etc.

Emergency sound evacuation system

The sound evacuation system must allow for the transmission of understandable information regarding the measures to be taken in the event of a fire, in order to ensure the safety of people within the protected area.

The system will consist of a sound evacuation unit that will serve the different floors of the building through dedicated speakers. The system must be designed in accordance with EN 54 and UNI 7240-19.

The control unit must be connected, via UTP cable, to the structured wiring system serving the special systems and to the supervision system, to which alarms, fault or malfunction signals will be communicated.

The microphone bases must be provided for the PA and emergency announcements and the VVF service in the control centre, which will be identified within the building for emergency management.

CCTV Video Surveillance System

The entire complex must be monitored both internally and externally and must comply with CEI 62676.

The cameras must be based on IP technology, must be equipped with IK10 anti-vandalism grade and must be equipped with Wide Dynamic Range (WDR) technology to improve the view of the scene in the case of images with high contrast due to the presence of windows or entrances.

All cameras will be equipped with Night & Day technology and dome/ minidome type with a minimum 4k resolution.

The system will be connected to the special systems network through dedicated poe switches that will be connected to the Ethernet interface of all components. The NVR system will have a double network port to be managed and interrogated both from the local control location (control centre for emergency management) and remotely.

The recording system must be sized to manage the flow of live video and continuous recordings at maximum resolution and must be integrated into the general control and management system of the Administration through the campus network. The protocols of all system components must comply with the hardware and software installation guidelines prescribed by the Administration in the latest version.

Anti-intrusion system

The intrusion prevention system serving the building will carry out continuous monitoring, in predefined time bands, of the same and will determine the activation of the alarm in the event of unauthorised access within all the compartments of the artifact. It must comply with CEI 79-2 and CEI 79-3.

The system will consist of a single central unit with ethernet interface and bus communication with the dedicated modules provided, installed in the main technical room and it will have to interface through the special systems network with the control centre for emergency management that will be provided.
The system will consist of dual technology volumetric detectors (microwave + infrared), triple-balanced magnetic contacts for all windows and entrance doors from the outside, as well as for the internal accesses of technical rooms and offices, microphone glass break sensors for doors and glass windows.
In the main and secondary outputs, keyboards must be provided for inserting/disconnecting the system.
The control unit must be connected via UTP cable to the structured wiring system serving the special systems and to the supervision system, to which alarms, fault or malfunction signals will be communicated. An alarm repetition and management panel must be provided in the control centre that will be identified for emergency management. The control unit will also have an IP-Ethernet interface that will interface with the special systems network and that will allow, through the installed supervision PC, the supervision of all the components of the system on a dedicated graphical map.
The system will activate, in the event of an alarm, external anti-foam, self-powered and self-protected sirens, and internal sirens; through a GSM telephone combiner it will warn the managers of the order service and the recipients of the preset telephone numbers; through the IP interface it will send an alarm signal to the supervisory stations of the administration.

Access control system
The purpose of the access control system will be to filter the transits and verify that any people, not authorized or not equipped with a valid coupon, enter the technical rooms, offices and warehouses: the system will allow access to the controlled rooms only to authorized people and will constantly memorize the status of the gates (open, closed, in alarm), reporting their real-time condition to the supervision system through an ethernet interface.

Automations at the service of the building
Automations must be provided to service the pedestrian and driveway entrance gates, which will activate mechanical actuations for opening and closing them. These automations must be interfaced with the emergency control and management centre for their supervision and opening in the event of an emergency. Each gate must be equipped with an external video intercom with anti-vandalism degree IK10, which through the call will be visualized by

the emergency management centre, that will manage and authorize entry by automatic activation of the mechanical actuations at the service of the gate.

Radio and television systems and antennas
Installations must be provided for the distribution of DVB T2 and sat signals with the equipment provided according to the CEI 100-7 standard; v5 for the rooms where events will take place and, in general, for all the rooms for meeting and/or conference activities.

Multimedia system serving the conference rooms
For meeting and/or conference rooms, multimedia facilities must be provided to allow events to take place. These systems will have to combine the aesthetic aspect, the general ergonomics of the room, the simplicity and reliability of the technologies and the modularity of the same for the possible choices to follow, or even simply for both technical and functional updates, maintaining an open, modular and highly integrable architecture of the proposed systems. The multimedia system must be designed based on the following considerations and needs:

- audio system suitable for the best satisfaction of multimedia events and conferences;
- audio and/or audio-video recording systems of the current event;
- control and management of audio/video with a system such as Digital media, hardware, software and touch-screen interface of all systems, to guarantee maximum ergonomics of use for both audio and video equipment for any circumstance of use of the room;
- integrated presentation of audio - video - data contributions;
- integration of video conferencing equipment with the possibility of participation also of the public present in the room;
- management of documents in electronic format during internal meetings;
- management of documents in electronic format during video conferences;
- recording of events taking place on hard disks and which can then be exported on optical media and/or keys;
- audio conference integrated into all the above situations;
- fully open system architecture with provision for the connection and broadcasting on the web of events in progress with simple addition and integration of the components necessary for this purpose;
- preparation of the entire system for the creation of an internal transmission network - reception and repetition of events carried out in the room to other remote points through the intranet and extranet, as a possible future development.

Digital signage systems
The building will have to provide an effective digital signage system that informs users about the activities planned by the library, to effectively direct specific groups of people to certain places and times with information and tailor-made entertainment, or to create interactivity.
The system will be interfaced through the special systems network with the emergency control and management centre where the information contents can be changed in real time through a software platform that will be provided on the supervision PC.

Lifting systems for people and things
Inside and outside the building, competitors must privilege the absence of architectural barriers, which must be limited only to cases in which it is materially impossible not to realize them.
If they are present, the building must be equipped with systems to overcome them. It will be necessary to install lift systems at the service of workers and users possibly combined with hoists.
The number of systems must be such as to guarantee continuity of service even in the event of failures or malfunctions. The systems will be electrical and built in Machine Room Less (MRL) version, i.e. without the dedicated technical room. The elevator operating devices will be installed in a control panel, positioned adjacent to the floor door corresponding to the upper landing.
The systems will be individual, in their own closed compartment, installed and located as indicated in the general project drawings.
The lifts must be designed and sized according to the fundamental parameters reported in the UNI 81-20, UNI 81-70, UNI 81-73 and Lombardy Regional Law no. 6 of 20/02/1989.
The lifts must comply with the requirements of the fire prevention project.

Mechanical systems

HVAC systems
The design of the structure must comply with current legislation on the containment of the energy needs of buildings. The plants should preferably be built using heat pump systems. In particular, the proposed plant solution should favour the adoption of systems that, under the same environmental conditions as indoor spaces, guarantee the greatest possible energy savings. The certification of the validity of the design solution must be demonstrated by the calculation methods provided for by current legislation and in accordance with the sustainability protocol that will be adopted. Regarding storage/archive premises, the requirements of UNI 10586 and the Ministerial Decree of 10/05/2001 must be respected. For office

premises, consultation, etc. the provisions of the Hygiene Regulations of the Municipality of Milan must be applied. Given the intended use of the environments, the plant system must ensure limited internal noise and, in any case, comply with the regulatory limits for which the appropriate acoustic project must be developed. The system must be divided into homogeneous areas, adopting the same criteria used for electrical systems, and must be equipped with automatic regulation systems for internal thermohygrometric conditions. Particular attention must be paid to the choice of positions and types of components in the field, in order to limit malfunctions caused by unauthorised manoeuvres by users. The design solution must guarantee the possibility of carrying out maintenance operations on all components in conditions of safety for the operators and the functional subdivision of the circuits must be such as to limit the disruptions following failures or malfunctions of the system. The system must be equipped with remote management systems and remote reading of thermohygrometric parameters (temperature, relative humidity, CO2 level).
In addition, systems for controlled mechanical ventilation must be provided, which must be designed using the same criteria used for heating and air conditioning systems and in accordance with the sustainability protocol adopted, the system must be designed according to the UNI 16798 standard.
The AHUs serving the building must allow the correct treatment of the primary air before sending it inside the environment to be air-conditioned. The air will be controlled both from the thermohygrometric point of view (temperature and relative humidity), and from the point of view of purity through appropriate filtration preferably through systems with rigid pockets for dust filtration with efficiencies according to the UNI 16890 standard and for the archive/ storage/consultation rooms according to the requirements of the UNI 10586 standard and the Ministerial Decree of 10/05/2001.

Fire control and extinguishing systems
The building must be equipped with fire control and extinguishing systems according to what will be prescribed by the fire prevention project that will be drawn up. The types of extinguishing system provided must also be compatible with the types of assets present within the various environments to be protected. The type of extinguishing agent must also be approved by the entities concerned (for example, the Archival Superintendency).
Competitors will have to adequately investigate the issue of fire prevention, both from a technical and economic point of view, regarding the operating expenses of the systems.
The systems must guarantee a high degree of reliability and maintainability and must be interfaced, through the special systems

network, with the general supervision system of the building.
In the case of the use of IGXX extinguishing agent or equivalent, the protected environments must guarantee the appropriate overpressure seals as indicated by the UNI reference standards and the oxygen concentration within them must be constantly monitored, also reported to the supervision system, in order to mitigate the risk of asphyxiation. The technical rooms serving the extinguishing systems must be integrated within the general volume of the building with appropriate solutions that guarantee compliance with the requirements of the fire prevention project.

Sanitary water systems
The supply and discharge networks of drinking water and domestic hot water must be provided in the dedicated rooms according to the UNI 9182, UNI 806 and UNI 12056 standards.

Hydraulic works
The following hydraulic works must be planned:
- sewage networks for only the sewage produced by the building;
- sewage networks for stormwater only: they will collect rainwater by means of road drainage and the building's rainwater network to convey it to works of hydraulic and hydrological invariance; only the flow rate permissible by law (Lombardy Regional Regulation no. 7 of 27/11/2017 as amended, Art. 8, paragraph 1) will be discharged to the municipal sewer network through delivery networks dedicated to stormwater.

In addition, the reuse of rainwater must be envisaged according to the Ministerial Decree of 11/10/2017 – "Minimum environmental criteria for the assignment of design services and works for the new construction, renovation and maintenance of public buildings" (point 2.2.8.2 of the Ministerial Decree) which may be used for irrigation of the relevant green areas.

4.10 ENVIRONMENTAL SUSTAINABILITY

In line with the recently approved Air and Climate Plan (P.A.C.) and its three founding components (mitigation of and adaptation to climate change and safeguarding of air quality), with the commitments of the Municipality of Milan within the C40 Cities network in the fight against climate change and with the "Do No Significant Harm" (D.N.S.H.) principle of the European taxonomy, competitors are asked to adopt a design approach oriented towards environmental sustainability and decarbonisation.
Specifically, the provisions of the P.G.T. 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. 10[14]. 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 form[15].

MEASURES TO MINIMISE EMISSIONS

Design element	**Measure to be used to minimise CO2**
High-performance energy solutions	Adoption of design solutions to minimise CO2 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
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

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

[15] 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

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 will ensure the maximisation of permeable green areas and the compliance with the provisions of Art. 10 in the development of further project levels.

It should be noted that during completion phase for the P.F.T.E., 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 P.G.T. Regulatory Plan[16].

In compliance with the provisions of the P.G.T., the Minimum Environmental Criteria (C.A.M.) 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 *Nuova B.E.I.C.*, 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 new library must be designed as a N.Z.E.B. - Nearly Zero Energy Building: a wide use of energy self-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. According to the principles of bioclimatic architecture, typological solutions and the performance of technological systems must respect

[16] 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

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 (N.B.S.), 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.

In particular, with regard to the theme of adaptation and resilience to climate change, the project proposal should include actions at the building level to ensure adaptation and resilience to risks such as the overheating increase in the summer months and inadequate heating in the winter months, leading to possible discomfort and damage to health, the high risk of extreme weather events that could compromise the safety and integrity of building elements, the high risk of flood events that could overload drainage systems and damage structures and materials.

chapter 5 FINANCIAL LIMITS AND ESTIMATION OF INTERVENTION COSTS

The maximum cost of intervention to be carried out (Economic Framwork, including cost of works, design costs, supervision of works, inspections, safety costs, Competition expenses and sums available to the Organising Body), is set at **€ 115.000.000,00 (VAT included)**.

The share of the amount for works is set at **€ 78.000.000,00 (excluding VAT)**, divided as follows:

- **€ 69.600.000,00 (excluding VAT)** as part of the works relating to the construction of the *Nuova B.E.I.C.* (Sub-area 1A);
- **€ 8.400.000,00 (excluding VAT)**, as part of the works relating to the superficial refurbishment of Via Cervignano (Area 2), as well as the creation of any connection between the *Nuova B.E.I.C.* and the new park (Sub-area 1B). Any sums not used for the connection referred to in Sub-area 1B can be used for the construction of the *Nuova B.E.I.C.* (Sub-area 1A).

Within the Economic Framework for the realization of the work, a sum is also foreseen for the sole design of the furnishings for the new library and for the sole design of any further green surface arrangement of the areas outside the new work; the value of the related works has been quantified on the basis of parametric estimates, respectively in:

- **€ 6.960.000,00**, for the furnishings of the *Nuova B.E.I.C.*;
- **€ 5,000,000.00**, for any additional surface greening of the areas outisde the new work.

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 143/1949 as amended;
- classification pursuant to Ministry of Justice Decree of 17/06/2016.

Cost of works	Classification Presidential Decree 207/2010	Classification Law 143/1949	Classification Ministry of Justice Decree of 17/06/2016
€ 36,740,000.00	OG 1	I/d	E.13
€ 18,321,000.00	OG 1	I/g	S.03
€ 4,097,000.00	OS 3	III/a	IA.01
€ 7,468,000.00	OS 28	III/b	IA.02
€ 3,742,000.00	OS 30	III/c	IA.03
€ 6,132,000.00	OS 30	III/c	IA.04
€ 1,500,000.00	OG 3	VI/a	V.01
€ 78,000,000.00	**TOTAL AMOUNT FOR WORKS (excluding VAT)**		
€ 6,960,000.00	OS 6	I/d	E.19
€ 5,000,000.00	OS 24	I/c	E.18

chapter 6 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 (P.G.T. "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 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;

Inter-ministerial 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;

Inter-ministerial 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.

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

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

Standard UNI 11306:2020 – Benches - Safety requirements 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*.

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 10/07/2020 – Technical regulations on prevention of fires in protected buildings pursuant to Legislative Decree no. 42 of 22 January 2004, open to the public, destined to house museums, galleries, exhibitions, displays, libraries and archives, pursuant to Article 15 of Legislative Decree no. 139 of 8 March 2006;

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;

Ministerial Decree of 06/03/1992 as amended – Technical and procedural rules for the classification of reaction to fire and approval of fire-retardant paint products applied on woody materials;

Ministerial Decree of 26/06/1984 as amended – Classification of fire resistance and approval of materials for 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;

Presidential Decree no. 753 of 11/07/1980 – New rules on police, safety and regularity of the operation of railways and other transport services.

Estimates

2022 Regional Public Works Price List – Lombardy Region – vol. 1.1, 1.2, 2.1, 2.2 and technical specifications vol.;

Measurement and Evaluation Standards contained as an integral part of vol. 1.1, 1.2, 2.1 and 2.2 of the aforementioned 2022 Regional Public Works Price List.

And also:

Ministerial Decree of 10/05/2001 – Act of guidance on technical-scientific criteria and standards of operation and development of museums (art. 150, paragraph 6, of D.L. no. 112 of 1998);

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;

Standards CEI 64-8:2021 – Standards for electrical installations;

Standards CEI 0-16 – Reference technical rules for the connection of active and passive consumers to the HV and MV electrical networks of distribution company;

Standards CEI 64-12:2019 – Guide for the execution of the earthing system in buildings for residential and tertiary use;

Standards CEI 82-25 – Guide to the realization of photovoltaic generation systems connected to the electricity networks of Medium and Low Voltage;

Standards CEI EN 62676 – Video surveillance systems for use in security applications;

Standards CEI 79-2 – Intruder, burglar and antiattack alarm systems - Particular requirements for intruder installations;

Standards CEI 79-3 – Alarm systems - Particular requirements for intrusion alarm systems;

Standards CEI 100-7 – A guide to the application of the Standards related to cable networks for television signals, sound signals and interactive services;

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

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

Standards UNI EN 12464-1:2021 – Light and lighting - Workplace lighting - Part 1: Indoor workplaces;

Standards UNI EN 12464-2:2021 – Light and lighting - Workplace lighting - Part 2: Outdoor workplaces;

Standards UNI EN 1838:2013 – Lighting technology application - Emergency lighting;

Standards UNI 9795:2021 – Automatic fixed fire alarm detection and fire alarm systems - Design, installation and operation;

Standards UNI EN 54 – Fire detection and fire alarm systems;

Standards UNI ISO 7240-19:2010 – Fixed fire detection and fire alarm systems - Part 19: Design, installation, commissioning, maintenance and operation of emergency voice alarm systems;

Standards UNI EN 81-20:2020 – Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 20: Passenger and goods passenger lifts;

Standards UNI EN 81-70:2018 – Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lift - Part 70: Accessibility to lifts for persons including persons with disability;

Standards UNI EN 81-73:2020 – Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts - Part 73: Behaviour of lifts in the event of fire;

Standards UNI 10586:1997 – Documentation. Climatic conditions for storage of graphic documents and characteristics of lodging;

Standards UNI EN 16798 – Energy performance of buildings – Ventilation for buildings;

Standards UNI EN ISO 16890 – Air filters for general ventilation;

Standards UNI 9182:2014 – Cold and hot water supply and distribution installations - Design, installation and testing;

Standards UNI EN 806 – Specification for installations inside buildings for the conveyance of water for human consumption;

Standards UNI EN 12056 – Gravity drainage systems inside buildings;

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

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