

# The Quality of the Project and the MIUR Standards for the Control and Funding of Buildings for Education and Training



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**Abstract** This paper reports the results of an activity of scientific advice for the winning project of the national competition for the construction of a new building for the *Fondazione Collegio delle Università Milanesi*. Starting from the project submitted to the IV MIUR funding tender in 2016, the attention is focused on the issue of the quality of the project and its development up to the detailed design phase within the current regulatory and procedural models defined by the MIUR and the Public works laws for the design and construction of temporary residences for university students.

**Keywords** Environmental design · Temporary residences · University colleges · Public works · Dimensional standards

## 1 Temporary Residences for University Students

The university student residency has been progressively attracting the interests of real estate investors over the last few years, appearing as a growing market, particularly in a city like Milan, which is increasingly showing a European propensity with the growing presence of foreign students.

The offer of accommodation in facilities specifically designed to host university students is considerably insufficient compared to the real demand, both in quantitative and in qualitative terms, obligating the users to face the free housing market.

To cope with these issues, the research is developing innovative design solutions and management tools, in order to interpret changing needs and lifestyles.

In light of these considerations, with the aim of encouraging the construction of new student residences, in November 2000 the Italian Parliament passed an ad hoc law, aimed at universities, public bodies and foundations, which provides for the co-financing of specific interventions concerning existing buildings, extensions,

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new buildings and purchases of buildings to be used as residences for university students.<sup>1</sup> The Law 338/2000 is the first national example of an organic program aimed at encouraging interventions towards different building scales: from the removal of architectural barriers, to building improvements for hygiene and safety, to maintenance, restoration, expansion and new construction, with also the possibility of purchasing areas and buildings for residences (Del Nord 2014).

This is an ambitious and innovative program aimed at increasing the number of dormitories and at improving the design and construction quality through proper and detailed regulations focused on the “Minimum dimensional and qualitative standards and guidelines relating to technical and economic parameters concerning the construction of housing and residences for university students”.<sup>2</sup>

Within this framework, the policy for university residence of the Milanese universities has profoundly changed and the panorama of their offer has been articulated also in relation to these building programs and their development.

The case of the *Fondazione Collegio delle Università Milanese* is one worthy of not in this regard, a Merit College legally recognized by the Ministry of Education, University and Research—MIUR, which in the recent years has started a significant construction program aimed at increasing the number of accommodation facilities.

Precisely within these activities, an international design contest published by the Fondazione was the chance for a group of researchers from the ABC Department—who focus much of their activity on the topic of social housing and special residences<sup>3</sup>—to transfer theoretical knowledge and research results on technological innovation, environmental quality and technical construction solutions within a design process in which these elements represent a significant added value. Analysis of trends, typologies and innovative international approaches, together with advanced tools and methods typical of the environmental technological project, as well as studies on the sustainability of building materials in a circular economy logic, have become important added values to support the project proposal which was then the winner of the competition.

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<sup>1</sup>Law 14th November 2000, n. 338 “Indications regarding the accommodation and the residences for university students”. The implementation of the law consists of the publication of National tenders: for each tender specific decrees are published for the definition of the modalities of presentation of the co-financing requests, the required documents, the spatial and functional standards, the procedures and the constraints for the co-financed initiatives.

<sup>2</sup>D.M. 28th November 2016, n. 936 “Minimum dimensional and qualitative standards and guidelines relating to technical and economic parameters concerning the construction of housing and residences for university students as prescribed by the Law 14 November 2000, n. 338”.

<sup>3</sup>Cf. research projects: “Policies, projects and techniques of rehabilitation and transformation of urban suburbs” MURST 1998, operative coordination Elena Mussinelli; “Innovation and project for residential buildings”, AUPREMA soc., coop., Elena Mussinelli (2005–2010); “To live tomorrow. Technological innovation and sustainability in the residential building project”, Fondazione Politecnico di Milano, coordinator Elena Mussinelli (2007–2008); “Hybrid modular architecture for emerging housing behaviours” PhD research, supervisor Elena Mussinelli, tutor Andrea Tartaglia (2015–2019); “Vivere e abitare l’università. Bilancio nazionale sulla residenzialità universitaria—Living in the university. National analysis on university residency” conference, scientific coordination Oscar Bellini and Matteo Gambaro (2019).

## 2 The Scenario for the Experimentation

The *Fondazione Collegio delle Università Milanesi* is a non-profit institution supported by seven universities and important public and private bodies of the city of Milan. The program of the *Fondazione* includes the provision and the management of student residence for temporary housing in a highly multicultural context, starting from the enhancement of an interdisciplinary and international method: a concept of “social intelligence” to promote life skills as well as cognitive supports such as extra-curricular course credits, which are the basis of this new educational approach. The current headquarters of the *Collegio* is in the south-west part of Milan, more precisely in a building designed by Marco Zanuso in the Seventies. This is site of great interest from both an architectural point of view—with a remarkable example of organic architecture promoted by *Cariplo* for hosting a center for financial aid to African countries—and an environmental point of view—with the presence of a high-quality garden that surrounds the area. The *Collegio*, with reference to the undergoing programs of expansion and consolidation of the campus, as well as to new development projects relating to accommodation, such as the Expo area, deals, in terms of scientific research, with the topic of university residence and of collegiality, with reference to the change of needs and to new cultural models and lifestyles. The activities of the *Fondazione* are aimed at the dissemination and at the promotion of college life, at the enhancement of the culture of merit, the internationalization of the university system and the integration of local realities. Through the study of the dynamics relating to temporary residency within multicultural contexts, it is also proposed as an incentive lever for social mobility and active citizenship.

In line with this approach, in 2008 it promoted an invitational competition for a first expansion of 53 new residential units. The winner project was by the Piuarch Studio, a choice that confirms that the *Fondazione* was well aware of the legacy of Marco Zanuso’s architecture (Nannerini 1974). The work is financed with the III tender of the 338/2000 law, started in 2016 and completed in 2019.

In April 2016, the *Fondazione*, before the publication of the IV tender of the law 338/2000, promoted a “Competition for the preparation of a preliminary project for the construction of a new building for the *Collegio di Milano*” for the second expansion, which saw a large participation of architects and engineers. The theme of the competition was the construction of a new autonomous building, with access from Via Ovada, to be used for accommodation for university students, with the relative common and service spaces. The competition was organized also with the aim of participating, with the winning project, in the selection procedure called by the Ministry of Education, University and Research (MIUR) of the IV three-year program of co-financing of student residences, in the framework of the law n. 338/2000. It also required the consideration, in addition to the dimensional and qualitative constraints defined by the framework of the 2011 decree, of the volumetric, typological, functional and technological characteristics of the work to be carried out. In order to meet the objectives of the promoter, the type of accommodation to be developed was that of a “hotel”, with a corridor distribution system and preferably single rooms with

private toilets. The collective residential services were to be concentrated in areas separated from the at least 50 rooms of the residents. In order to respect the qualitative standards and the functional program, the evaluation criteria for the identification of the winning project were indicated by the tender, summarized in: “aesthetic and functional aspects” with particular reference to landscape integration and the relationship with pre-existing buildings of the campus; “economic aspects” with particular reference to durability and the control of the construction and management costs; “general aspects” in compliance with the conditions of the tender and the use of advanced technological solutions.

The jury of the competition awarded the project of *Centro Studi TAT*, coordinated by Fabrizio Schiaffonati<sup>4</sup>, stressing in the motivation the original approach related to environmental integration and the effectiveness of the techno-typological solution. The winning project, even if it was in continuity, due to its morphological and typological characteristics, with the two previous interventions, also coherently interpreting the Zanuso’s legacy, to which it explicitly referred without any manneristic satisfaction, was able to implement and qualify the open public space both with environmental and social values. It consisted of a linear building with a north-south orientation, articulated in two sections of different width, a double body and a triple body.

The expansion project, which has obtained already the funding by the MIUR, is based on principles of environmental compatibility, typological and functional optimization of spaces and maximization of maintainability, substitutability and durability of materials and technologies adopted, as suggested and derived also by the preliminary studies carried out by scientific consultants.

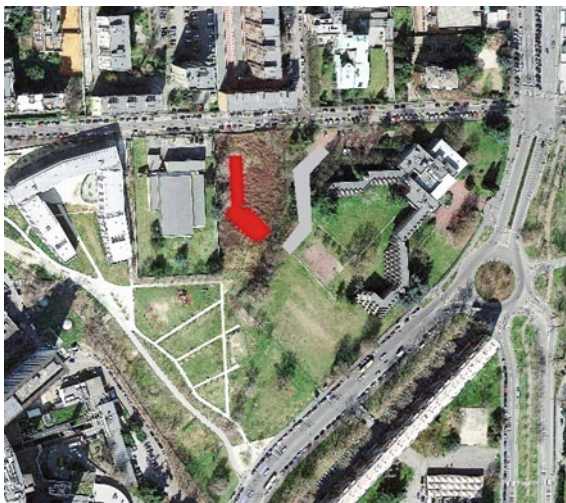
### 3 The Design Experimentation

The campus of the *Collegio di Milano* has an area of 22,400 square meters, of which only 4,000 are occupied by the original intervention dating back to the early Seventies designed by Marco Zanuso and the recent expansion by the Piuarch Studio, with a total capacity of around 170 university students. In 2016, the area was expanded with a new contiguous plot measuring 4,600 square meters, already allocated by PGT to university residence, which therefore led to a total area of 27,000 square meters, with a total capacity of 220 beds (Fig. 1).

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<sup>4</sup>The winner group consists of CSTAT, and refers to architects Fabrizio Schiaffonati, Arturo Majocchi, Giovanni Castaldo, with Elena Mussinelli, Andrea Tartaglia and Matteo Gambaro as scientific consultants for the techno-typological aspects, technical innovation and environmental sustainability, and the collaboration of Roberto Castelli, Federico Cecere, Gregorio Chierici and Francesca Scrigna. The winner was also entitled for the development of the definitive and detailed design as well as for the related commitments for the obtainment of the authorizations and permits for the construction (Tartaglia 2018), and for the definitive and detailed design phases the team included also BCMA, Brogini and Carrera Studio for the structural design and Casassa and Cigliutti Studio for the systems design.

**Fig. 1.1** Aerial photograph of the campus with the first expansion highlighted in gray and the second in red



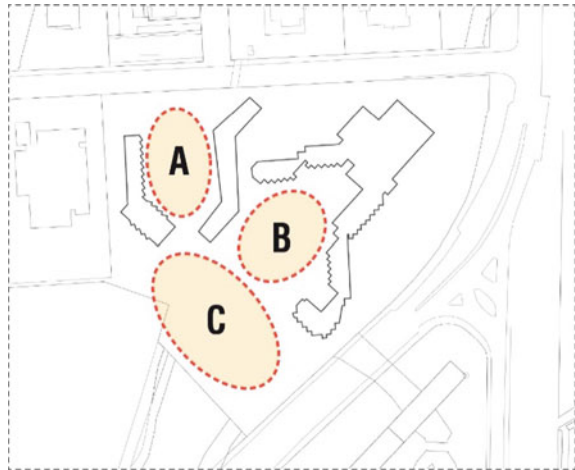
### *Environmental Compatibility*

The intention of the project was to combine the criteria of high architectural quality with the environmental and economic sustainability of the intervention. An approach that takes into account the constraints of the context, distances from the existing buildings, heights of the surrounding buildings and orientations (Schiaffonati et al. 2011). Also enhancing the potential of the campus characterized by a remarkable amount of greenery, including a sports area, with free pedestrian and scenic paths that confirm the attention for the landscape paid by the designers of the previous interventions.

The new volume originates from the observation of the overall texture of the context, the matrix of which is represented by Zanuso's organic plant building, which Piuarch took into consideration in the morphology and alignments of their intervention, and which the new extension confirms completing a coherent articulation of the entire building complex. So the basis of the project concept is the role that the new building will play in completing this urban environment. The Zanuso building, consisting of two arms connected by a central nucleus, defines a "C" shape open towards south-west. The body of the building designed by Piuarch represents a further arm, which, with the building proposed by CSTAT completes the plant by enclosing a new space into a new "C" facing north. This morphological and functional recomposition defines the succession of two "C"s, one open towards the south (building by Zanuso) and the other towards the north (Piuarch building and the new addition) (Fig. 2).

Therefore, the project is configured as a building divided into two parts, the first with a double body in a north-south orientation with one façade facing via Ovada and the second, with a triple body, rotated of about 30° towards south-east. This choice reflects the objective of minimizing distribution spaces, particularly in the triple body, the surface to volume ratio of which is also particularly efficient from

**Fig. 1.2** General plan with the identification of the three open spaces defined by the buildings



an energy point of view. The building consists of 4 floors above ground: the ground floor, with shared access and services, and three residential floors with some services. The total surface area is  $1,927 \text{ m}^2$ , with a gross volume of  $5,781 \text{ m}^3$ . There are 51 rooms, including 3 for disabled use, and all the required additional services.

The environmental compatibility is the result of planivolumetric, morphological, typological, system and technological choices, as well as of alignments in terms of orientation and optimization of the sunlight (Schiaffonati et al. 2015). The soil consumption is limited, with a small footprint of the building that maximizes the permeable surface. Even the open spaces, with prevalent lawn portions, confirm the objective of limiting the environmental impact of the intervention in terms of hydraulic invariance and permeability. The green described above helps to mitigate and compensate for the intervention.

The open space facing the building is configured as a new square, partly paved and partly green, which visually and functionally connects the different buildings; this space is characterized by the presence of plants and trees, with the function of mitigating and increasing the environmental quality, as well as by the presence of chairs. The compact building shows on the facades the regular rhythm of the windows of the rooms and of some wider openings for common services. A number of volumetric additions and subtractions aim to maximize the energy performance of the building, as well as to express spatial relations with the context and to characterize the building in terms of recognizability. In this sense, the arcade on the ground floor operates as a covered connection between the new pedestrian entrance of via Ovada and the atrium of the building (Fig. 3).

#### *Building Typology and Distribution Characters*

The “hotel” building typology distributes the (single) rooms partly along the double body and partly (24 rooms) along the triple body with a central corridor. This



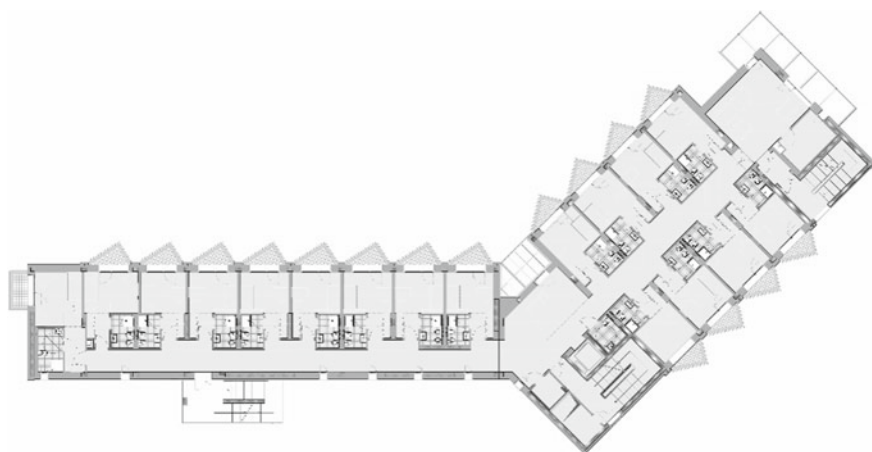
**Fig. 1.3** Perspective view from the south of the new building



“hybrid” distribution system aims to optimize the corridor space, to enhance the orientation and to harmonize the new building within the pre-existing morphological and environmental context. Thus, the new volume seeks to dialogue with existing and under-construction buildings through its alignment and dimensions. The articulation of the distribution system also offers optimized views to the rooms: the corridor is in fact located on the west side in the double-body portion and centrally in the triple-body portion. The correct orientation of the rooms contributes to increase the quality of the spaces of the residence, as well as the overall energy efficiency of the building.

The distributional rigor and the optimization of the relationship between served/servant spaces are also sought at the accommodation scale. Each room has an area of  $17.9 \text{ m}^2$ , including a bathroom of  $3.9 \text{ m}^2$ . All the rooms have a  $4 \text{ m}^2$  balcony and an entrance that serves the bathroom and the room. The arrangement of the furnishings, even if with a certain degree of flexibility, is designed to guarantee high levels of rationality and usability of the spaces. The wide windows of each apartment allow for a correct solar gain and the visual fruition of the context. The window is smooth, packable on one side, with a maximum opening of more than  $2.40 \text{ m}$ . When fully open, the balcony becomes an extension of the interior space. On the privileged fronts for sun exposure (east and south-west) there are 39 rooms, only 12 facing north-east (Fig. 4).

The residential spaces are completed by the services prescribed by the National tender and by the decrees. The environmental units for services envisaged by the project are: cultural and educational services (study rooms, multi-purpose spaces



**Fig. 1.4** Type floor plan of the new building

for conferences and educational activities: 265.9 m<sup>2</sup>); recreational services (multipurpose spaces, lounge spaces: 96.5 m<sup>2</sup>); support, management and administrative services (laundry, warehouses, office space: 118 m<sup>2</sup>); access and distribution functions.

*Material Alternatives, Maintainability, Substitutability, Durability of Materials and Construction Technologies*

The material simplicity and the volumetric rigor of the facades are a salient feature of the image of the new building, also to ensure a high degree of maintainability, durability, substitutability of the various components. The external envelope is characterized by the provision of a ventilated façade, of which the last layer is made up of large vertical GRC panels, which, in addition to guaranteeing adequate energy performance, are optimal for conservation and maintenance issues. The large translucent vertical closures of the rooms and of the common spaces provide for the adoption of doors and windows with profiles with a thermal break.

Another key-element of the facades is the triangular-shaped balconies of the rooms, which represent an expansion of the living space and an important view on the surrounding greenery. The “jagged” image of the balconies of the rooms is an explicit reference to the architecture of Marco Zanuso. The parapet of these balconies is partially opaque, realized with a GRC panel and partially transparent grate of metal rods.

On the west elevation there is an external safety staircase designed with a central reinforced concrete core that supports cantilevered ramps, stairs and horizontal connections, with transparent metal parapets.

Overall, material choices have been made in harmony with the main colors identifiable in the surroundings, without any sophisticated contrast. The elevated structure



is in reinforced concrete. In the competition, the proposal included also the possibility of using concrete blocks made with aggregates, produced with the use of the waste from recycled glass processing: solutions developed by the research “Ethical concrete” which also saw in 2015 the participation of a number of researchers from the ABC Department (Tartaglia et al. 2016).

**Standards and Laws** Legge 14 novembre 2000, n. 338 Disposizioni in materia di alloggi e residenze per studenti universitari.

D.M. 28 novembre 2016, n. 936 Standard minimi dimensionali e qualitativi e linee guida relative ai parametri tecnici ed economici concernenti la realizzazione di alloggi e residenze per studenti universitari di cui alla Legge 14 novembre 2000, n. 338.

D.M. 7 febbraio 2011 n. 27 Standard minimi dimensionali e qualitativi e linee guida relative ai parametri tecnici ed economici concernenti la realizzazione di alloggi e residenze per studenti universitari di cui alla Legge 14 novembre 2000, n. 338.

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