

Enrique Castaño Perea  
Ernesto Echeverría Valiente *Editors*

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# Architectural Draughtsmanship

From Analog to Digital Narratives

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Enrique Castaño Perea · Ernesto Echeverría Valiente  
Editors

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 Springer

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# Preface

The book presented here is a compilation of articles collected under the title *Architectural Draughtsmanship: EGA (Architectural Graphic Expression) From Analog to Digital Narratives*. It is the result of the International Congress EGA (Architectural Graphic Expression)16 held in Alcala de Henares in June 2016 with the subheading: “Teaching and researching in architectural graphic expression.”

This was the 16th edition of the Congress, and it was again centered on the exchange of knowledge of what is taking place within the arena of architectural graphic expression inside and outside of our country.

The implementation of a successive curriculum over a short period of time (BA in Architecture, BA in Fundamentals of Architecture, Master of Architecture and Ph.D.) has led to the necessity of restructuring all areas of study within this field, and for that reason, it seemed the right moment to turn our attention to the work of professors and researchers. As the last Doctor Honoris Causa of the University of Alcala Kenneth Frampton said in his acceptance speech, we have to reclaim innovation by starting from tradition, both in terms of architecture and educational disciplines attached to it.

This book is organized into two major parts:

A/ Research into the field of architectural graphic expression, including related areas of education, in which innovative experiences have been presented in the new curricula,

B/ and how to teach research methods that are essential to the work and experiences found in the field of postgraduate studies.

The editors have grouped the articles into four major chapters, according to their individual subjects:

1. Innovation Teaching Strategies (Teaching experiences applied in EGA).
2. Design and Education (General education concepts in EGA).
3. Design and Architecture (Design issues related to current architectural practice).
4. History and Cultural Heritage (History of a particular designs and/or the design’s application within the architectural heritage).

Blind pairs reviewed all articles as a guarantee of quality in order to obtain the recognition of the scientific community.

All the works are in English, although they may have originally been written in one of the languages of the Congress, either Spanish, Italian, or Portuguese, with the goal of emphasizing their respective international characters.

We believe this compilation of articles could be the trigger to start a new collection of books about the international relevance of architectural graphic expression. It is the result of the important contributions taken from the congresses dedicated to the subject that have been held regularly for over thirty years, with the participation of a large number of researchers from European and Latin-American countries.

Alcalá de Henares, Spain

Enrique Castaño Perea  
Ernesto Echeverría Valiente

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# The Development, Recovery and Reuse of the Architectural and Urban Heritage: Former Barracks as University Location

Antonella Salucci

**Abstract** The contribution proposes an investigation on the Villarey former barracks, an historic building considered part of the architectural heritage of down-town Ancona (Italy), recovered as a university location. The methodology includes two main fields of observation: on the one hand, the analysis of the original design drawings leading to the building of the barracks (1865–1868); on the other, the reading of the restoration project drawings illustrating the design process for the recovery and redevelopment of the Villarey former barracks as the Faculty of Economics of the University of Ancona, Italy (1989–1998). Through typical methodologies of the disciplines of Representation, the events leading to the recovery of an important urban and social down-town area of Ancona (Italy) can be retraced.

**Keywords** Heritage · Architectural drawings · Barraks

## 1 Foreword

This text investigates the relationship between Representation and Architectural Design through a reading of events that led to the renovation and reuse of an important example of architectural and urban heritage in the historic centre of Ancona: the Villarey Barracks, constructed in the mid-1800s. Occupied by an infantry regiment until the Second World War, the Barracks were successively utilised in part as shelter for displaced persons, before falling into disrepair in the 1970s. Toward the end of the 1990s the structure became the object of a vast plan for the rehabilitation and recovery of the Cardeto Park to create a new university campus. Today, the former Villarey Barracks are home to the Università degli studi

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di Ancona's Faculty of Economics. The renovation project was designed to respect the historic memory of the city.

In the text we propose three levels of reflection, paralleled by ten images. They allow readers to retrace the events that led to the urban and social recovery of an important part of the historic centre. The first level of analysis deals offers a comparative reading of original design drawings of the New Villarey Barracks, developed by Valeriano Bernardini in 1868, together with documents related to what was in all likelihood his reference: a prototype barracks with similar characteristics published in 1863 by the Military Engineer Giovanni Castellazzi. This phase was supported by the direct examination of archival material, specifically the vast collection of drawings and texts conserved by the ISCAG, the *Istituto di Cultura dell'Arma del Genio di Roma*. The second reflection looks at the renovation project that culminated, at the end of the 1990s, in the and functional adaptation of the former Villarey Barracks as the new home of the Faculty of Economics and Business at the Università degli studi di Ancona (1989–1998). The third level looks at the person behind this important renovation and his ideas: Carlo Mezzetti (Rome 1933–2009), professor, professional, master and “Vitruvian architect”, to whom this text pays homage. The first part of the essay geographically and historically positions the construction of the building, summarising key historic in the city, in addition to looking at a number of projects tied to the evolution of the city's defensive structures that played such an important role in defining its layout.

## 2 The City, the Barracks, the Prototype

Ancona's geo-topographic position and function as a port constitute the two principal invariants that determined the evolution of its urban fabric, situated between two lines defined by the coast. The form of the city resembles a triangle anchored to the south by the limestone mass of the Monte Conero, and to the east by the line of the upper coast, subject to maritime erosion and defined by Monte Guasco, Monte dei Cappuccini and Monte Cardeto (Pavia and Sori 1990).

The courtyard building of the Villarey Barracks—constructed in the mid-1800s according to the project by the Military Engineering Corps as part of the post-Unification projects to modernise the city's articulated and complex defences—is situated to the east of the port, tangential to the compact fabric of the city and the natural area of the future Cappuccini-Cardeto Park.

One of the primary architectural elements in the urban landscape, the complex occupies almost 1 ha. A true landmark, situated in a luxuriant area near the northern coast, its main elevation represents the backdrop to the axis of Via Indipendenza, which runs north-east from Piazza Cavour (Figs 1 and 2).

The area near the site of the future barracks was originally settled by the Piceni, followed in the 4th century BC by the Dori, the founders of Ancon, a natural port and important reference to the defence of the Adriatic. Ancona became a Roman colony during the Republican Era. As it developed it conserved the original plan of

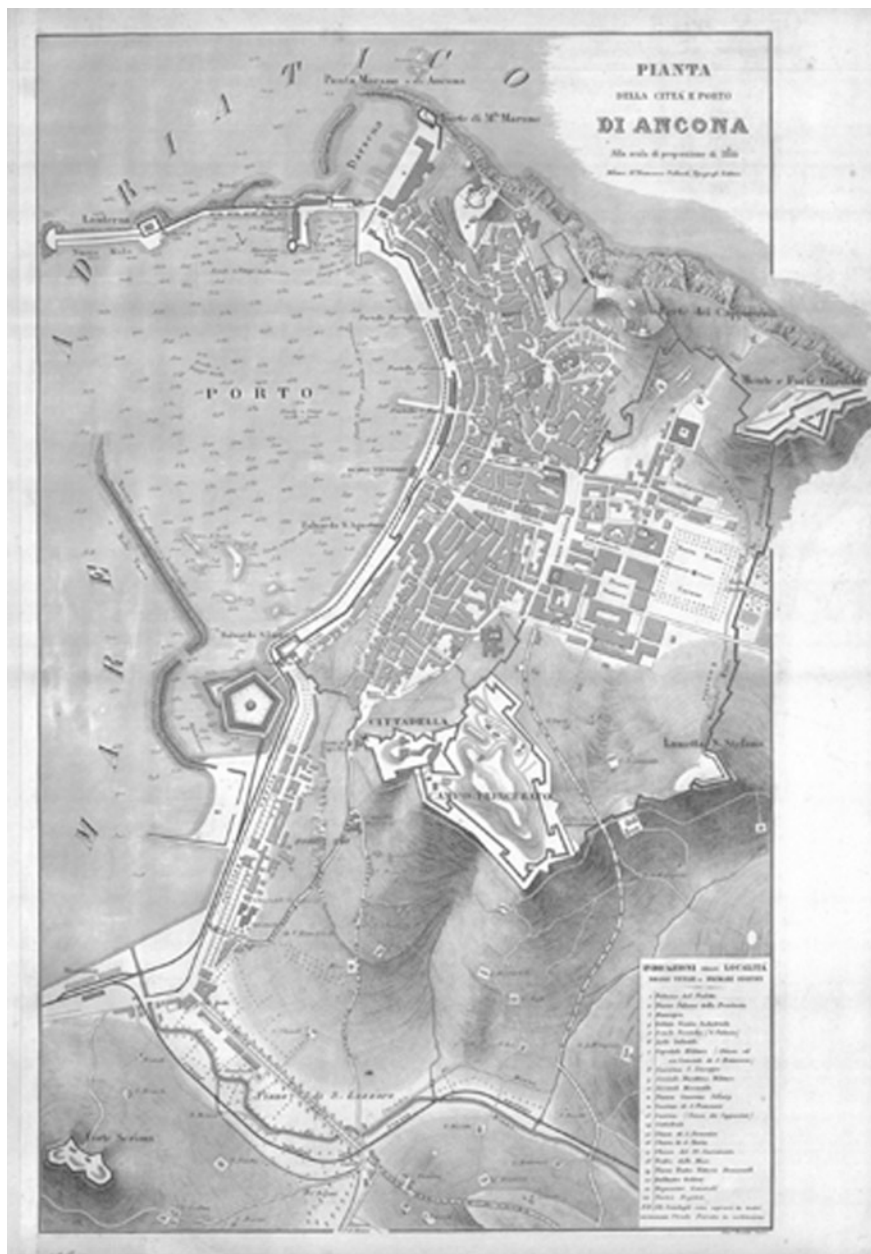


**Fig. 1** Ancona. Satellite view of the area adjacent to the former Villarey Barracks. Google 2015

the *polis*. During this period the defensive system in Ancona consisted of a 2300-m long wall, and a total area of 25 ha. After the year 1000, flourishing mercantile activities brought a notable impulse to urban development and the walls grew to 4200 m in length. The transformation of the city's defensive structures by important military architects made Ancona the most important military outpost of the Papal State east of Rome. Beginning in 1532, to protect against the threat posed by the Turks, Pope Clement VII commissioned Antonio da Sangallo with the construction of a fortress atop the Astagno Hill: the building was characterised by a star-shaped plan with five bastions. Two centuries later, in 1732, as part of plan to re-launch commerce and the functions of the port, Pope Clement XII proclaimed the city of Ancona a “*porto franco*” (free zone) and entrusted Navelli with the project for the requalification and expansion of the port and the construction of the *Lazzaretto*. In 1797, the French and Napoleon occupied the city. The occupation favoured improvements to military structures protecting the city and the port, from land and sea (Pavia and Sori 1990, 48).

The Unification of Italy had a strong impact on the evolution of the city of Ancona, which immediately became of strategic national importance due to the presence of the port. Prior to Venice's becoming a part of Italy, Ancona was the most important naval outpost in the Adriatic, representing a true bulwark against the Austrian fleet. The 1861 Master Plan united the civil needs of the nascent middle class with the requirements of the military, attributing a great deal of importance to the system of defensive works. A consistent military presence during this period is documented in the census taken the same year, which details the presence of 5000 soldiers and a total population of 46,090 inhabitants (Mariano 1987, 176).

Manuals on military architecture are traditionally subdivided into ‘fortifications’ and ‘buildings’. The first were based on theories expounded in treatises from the fifteenth and sixteenth centuries; the second dealt with the realisation of military works—barracks, hospitals, armouries, stables, warehouses—that, following the creation of the *Corpi del Genio* (Military Engineering Corps) as part of modern European armies, were designed and built almost exclusively by engineers and architects who were soldiers by profession (Fara 1985, 9).



**Fig. 2** Plan of the city and port of Ancona. 1868. Engraving 41 × 58.5 cm. *Atlante Geografico dell'Italia*. Francesco Vallardi Editore, Milan

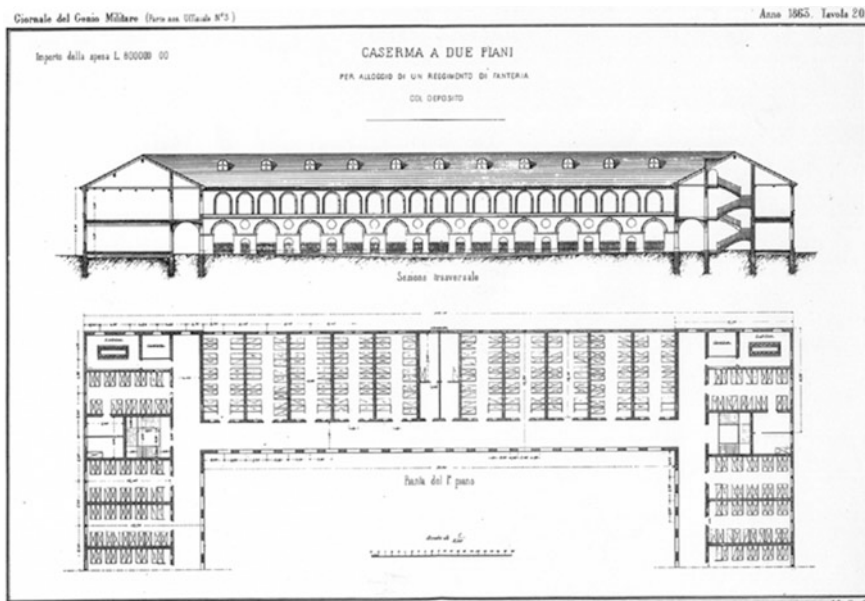
The new Villarey Barracks for the military contingent stationed in Ancona, dedicated to General Maurizio Rey di Villarey, who fell at Custoza in 1866, was constructed between 1865 and 1868, under the direction of Lieutenant Colonel Giuseppe Morando of the Military Engineering Corps (Salucci 2001).

One of the central figures in military architecture from this period was Giovanni Castellazzi, a graduate of the Politecnico di Torino, disciple of Carlo Promis and, after 1848, an official with the Corps. He was responsible for the codification of true prototypes—“designed for maximum economy and speed of construction” (Fara 1985, 38)—that for many years constituted the reference for various projects built in Italy. After 1863 Castellazzi was head of the technical office of the Engineering Corps of Turin; he was commissioned with a two month mission to visit military establishments in France, Belgium and Great Britain and “the various provinces of the Kingdom [of Italy—TN]” to acquire competences in methods and techniques of construction. During this campaign—accompanied by Captain Biagio Debenedictis, from the Corps’ office in Ancona—he produced a relevant quantity of full size sketches published posthumously (Castellazzi 1864, 1876).

After Giovanni Castellazzi was named director of the *Giornale del Genio Militare*, he proceeded to publish a selection of his projects for barracks designed to house men and horses. This periodical, founded by the Ministry of War on 18 January 1863, consisted of an “official” and an “unofficial” section. All contents of the first section had to be approved by the Ministry; the second—accompanied by drawings gathered together in an Atlas—was dictated by guidelines for the study and design of new constructions entrusted to Army officials. The “unofficial section” of the third issue of the *Giornale del Genio Militare* of 1863 presented a project for a “Two-storey barracks for an Infantry Regiment with storage”: a square plan building with a porticoed internal courtyard. The plans and elevations of this structure served as the reference for the design and construction of the new Villarey barracks in Ancona (Castellazzi 1863a, b) (Fig. 3).

The prototype developed by Castellazzi presented three different solutions for the ground floor and the affinities with the appearance and layout of the building in Ancona can be found in plates 19, 20, 21,—plans, elevations, sections and details—from the *Atlas* provided with the *Giornale*. Looking at these drawings, it is easy to identify the typological and stylistic similarities with the drawings for the new Villarey Barracks, designed by Valeriano Bernardini a few years later.

Of the numerous documents that must have comprised the dossier “*Progetto per la Nuova Caserma Villarey*” (Project for the New Villarey Barracks), the *Istituto di Cultura dell’Arma del Genio* (ISCAG) conserves six drawings numbered from 32 to 37, showing plans, elevations and sections. Executed in ink and watercolour on thick paper measuring 68 × 46 cm, the drawings feature an italic script describing their content and the author’s name and the stamp, date and signature of the presiding official: “*Valeriano Bernardini disegnò. Ancona, Addì 10 agosto 1868. Tenente Colonnello Direttore del Genio Giuseppe Morando*” (Drawn by Valeriano Bernardini. Ancona. 10 August 1868. Lieutenant Colonel Director of the Engineering Corps Giuseppe Morando). The drawing scale is shown on each of the six drawings: four horizontal sections at 1:400; four vertical sections at 1:200.

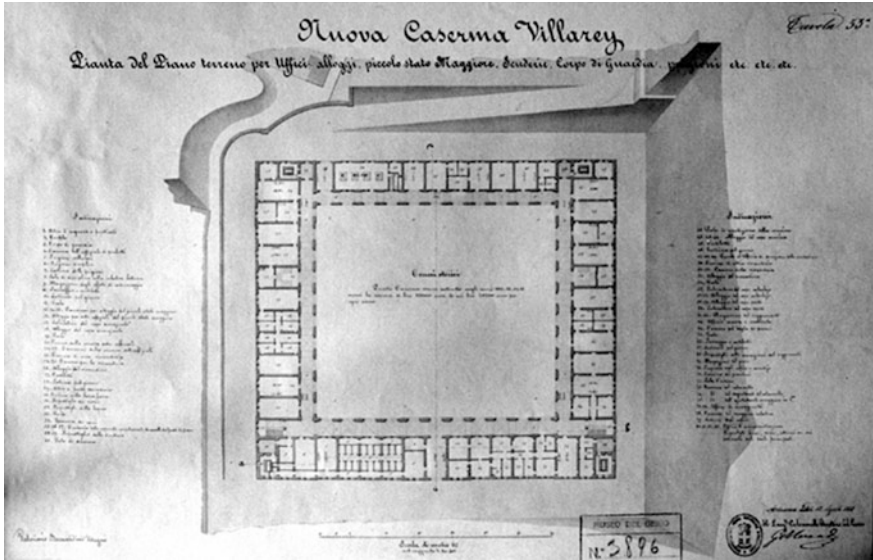


**Fig. 3** Castellazzi (1863a). “*Caserna a due piani per alloggio di un Reggimento di fanteria col deposito. Sezione trasversale. Pianta del 1° piano. Scala metrica nel rapporto di 1 a 250*”. *GIORNALE DEL GENIO MILITARE*, n. 3, Parte non Ufficiale, Atlante, Tavola 20. (“Two-storey barracks for an Infantry Regiment with storage. Cross section. First floor plan. Scale 1:250”, *GIORNALE DEL GENIO MILITARE*, n. 3, Unofficial Part, Atlas, Plate 20)

The page layout includes notes specifying the dimensions—the barracks were designed to host 1280 men on the first and second floors and 14 horses on the ground floor—and the date of construction and costs: “*questa caserma venne costrutta negli anni 1865, 66, 67, 68 mercè la somma di lire 830.000 circa, di cui lire 207.500 per ogni 1st year*” (this barracks was constructed in the years 1865, 66, 67 68 for the sum or approximately 830,000 [Italian] Lira, or 207,500 Lira for each year) (Fig. 4).

The building was designed with an enclosed porticoed courtyard, measuring  $62 \times 56$  m. Its main axis is oriented in the north-west direction. It is comprised of three equal wings forming a ‘U’, each three storeys in height, connected by a shallower fourth construction that is only two storeys high and situated at the edge of the Cardeto Park.

The ground floor demonstrates a succession of spaces characterised by pier walls, at approximately 6.25 m on centre, set orthogonally to the façade. These in turn support a sequence of polycentric barrel vaults reaching a height of 5.20 m at their centre and 3.60 at their spring point; the bay covering the entry atrium is 5.40 m at its highest point. The “*porta della Caserma*”, the entrance atrium, occupies an entire bay and stands at the centre of the main building wing; a second connection with the outside is situated at the left end of the crossing wing.



**Fig. 4** Bernardini (1868). “Nuova Caserma Villarey. Tavola 33”. *Pianta del Piano terreno per Uffici, alloggi, piccolo stato Maggiore, Scuderie, Corpo di Guardia, prigioni etc. etc. etc. Scala 1:400*”. (New Villarey Barracks. Plate 33. Ground Floor Plan with Offices, Lodgings, small General Staff, Stables, Guardhouse, prisons, etc., etc., etc. Scale 1:400). Historic Archives of the Istituto di Cultura dell’Arma del Genio di Roma (ISCAG)

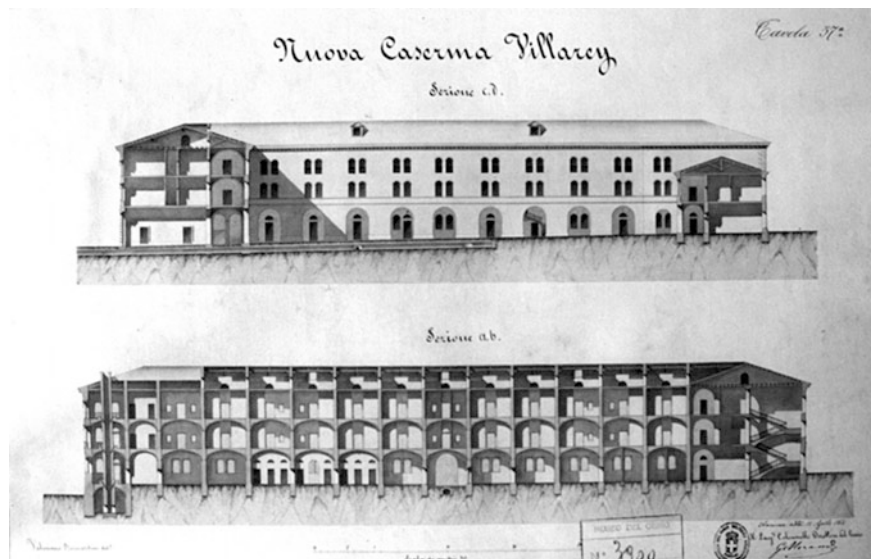
There are a total of five stairs, equally distributed along the portico; a service stair serves the smallest wing, while the other four are located in the east and west wings; the main staircase, larger and with three ramps, are positioned at the centre, while the secondary stairs with two ramps are at the south end. There are two vertical sections, shaded and drawn at a scale of 1:200 on plate 37.

The “Section CD” is taken along a vertical plane cutting through the main axis of the building; it looks toward the west wing, offering a view of the internal elevation and cutting through the three-storey south wing, along the entry atrium and through the stables of the two-storey north wing.

The “Section AB”, with looks toward the north wing, cuts through the main wing of the building along parallel planes, passing through the corner block of toilets, the corridor of the prisons, the guardhouse, the entry atrium, the offices and the stairwell. This drawing depicts the characteristics of the construction of the foundations, the load bearing structure, the stairs, the barrel vaults covering the ground and first floor rooms and the pitches of the main roof supported by wooden trusses.

The metal balustrades of the stair are represented in blue.

The building was constructed entirely in a sacco (rubble) masonry faced in white stone from Monte Conero and pink stone from the Furlo Pass, with intermittent double brick courses (Fig. 5).



**Fig. 5** Bernardini (1868). “Nuova Caserma Villarey. Tavola 37<sup>a</sup>. Sezione CD; Sezione AB. Scala 1:200” (New Villarey Barracks. Plate 37. Section CD; Section AB. Scale 1:200)

The external elevations show a stone skirt surmounted by: a flat rusticated base of elements with rounded corners, a tall flat floor marker and two upper levels finished in smooth plaster; rusticated corners mark the edges of projections at the corners and along the axis of the main entrance.

Unlike the external façades, which feature small projections and setbacks that define a progressive play of *chiaroscuro*, the elevations of the internal courtyard are characterised by a decorative approach that plays with surfaces: a homogenous pattern of ochre bricks alternates with courses in red brick used to reinforce the architectural features of the portico and bifora windows on the upper storeys and the floor marker at the first floor.

### 3 A Barracks for the University

The project to renovate the former Villarey Barracks was commissioned to Carlo Mezzetti, Luigi Ramazzotti and Giuseppe Tardella by the Università degli studi di Ancona; structural engineering was entrusted to Giovanni Menditto; mechanical and electrical engineering to Fulvio Capparelli; work supervision to Carlo Mezzetti and Giovanni Menditto; the contractor was the ATI SOGECA srl of ing. Gerolamo Nardella of Naples. The story of this complicated undertaking, begun in 1989 and concluded in 1999, is summarised in article by Gabriele Milelli, a historian and professor with the Università degli studi di Ancona, published in 2000 in



*L'Architettura Cronache e Storia*. He notes that, despite the numerous difficulties presented by a very particular urban condition and the complex restrictions imposed on the designers, the need to design a new home for the Faculty of Economics and Business was approached as a challenge and opportunity to create a work of architecture.

Planning regulations required different solutions to diverse orders of problems, and the specific needs of the new Faculty of Economics: transforming and requalifying a portion of the city that included an imposing abandoned military structure; establishing a new presence for the university in an area adjacent to the historic centre, favouring the integration between students and the city; opening up a connection between the city and the view toward its northern coast.

The clarity of the original *parti* constitutes the matrix of the reorganisation of the complex system of classrooms, reading rooms, service blocks, libraries, departments, etc. that make up the new Faculty. The project adapts to the formal characteristics of the original construction, a true “urban document” of pre-Unification Italy.

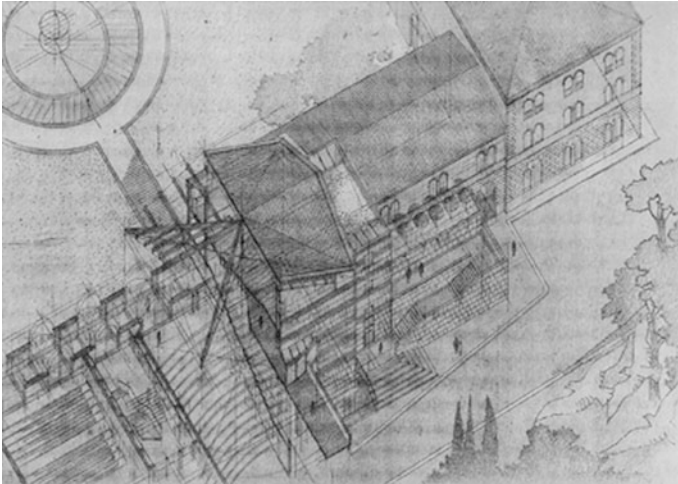
With respect to the modular rhythm of the original plan, the project exalts the nodes of vertical connection recognisable in the “two double devices of stepping ramps and normal stairs, travelled respectively in the clockwise and counter clockwise directions, whose landings are situated in correspondence with the floor levels and stair landings” (Milelli 2000). An imposing structure in reinforced concrete, with a marked difference in scale with respect to the other parts, overlaps the old structure, substituting the former wing of the stables with a system of large classrooms covered by a roof of different sloping planes.

The new elevation features a two-tone finish of white-grey stone, with different openings bringing light into the complex system of ramps and landings leading to the large classrooms that substitute the former wings of the stables. The summit of the elevation features a tympanum motif that reveals the playful nature of the new laminated wood roof structure.

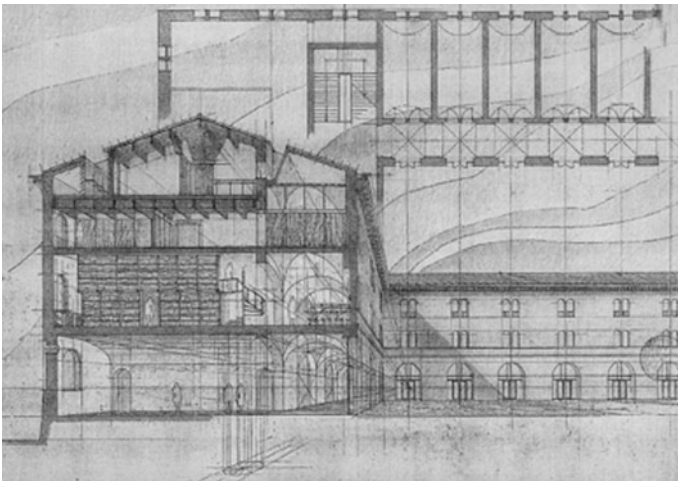
A raised pedestrian gangway leads directly from the intermediate level of the classrooms to the roof of the parking structure, which also serves as an outdoor atrium. This space creates a connection with the planned Cardeto Park through the landscaping of the internal courtyard and the introduction of a centrally positioned fountain. All of the new functions fully respect the existing structure (Figs. 6, 7 and 8).

## 4 A Vitruvian Architect

We conclude this text with a look at the creative history of the author of the renovation of the former Barracks—Carlo Mezzetti (Rome 1933—Rome 2009)—based on the structure outlined in Franco Purini’s Presentation to the monographic publication *Carlo Mezzetti. Itinerari di architettura*, from October 2007 (Sardo 2007).

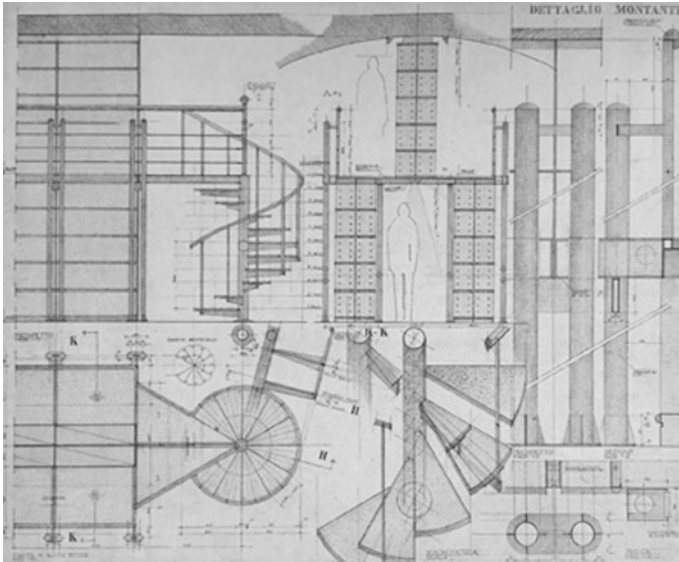


**Fig. 6** Mezzetti (1995). New faculty of economics in the former Villarey Barracks, Ancona. “Axonometric view of the wing of large classrooms”. Pencil and pastel on paper. (Folder n. 335/500)



**Fig. 7** Mezzetti (1995). New faculty of economics in the former Villarey Barracks, Ancona. “Perspective section of the main ‘U’-shaped wing”. Pencil and pastel on paper. (Folder n. 335/500)

This large volume, filled with drawings, photographs and critical essays, is a sort of “architectural autobiography (...) a catalogue of drawings to be admired at least as much as they are to be appreciated for the quantity of knowledge contained in each of their lines”. Purini refers to Carlo Mezzetti as a “Vitruvian architect able to integrate a rigour of composition and construction and a vocation for the precise



**Fig. 8** Mezzetti (1995). New faculty of economics in the former Villarey Barracks, Ancona. “Architectural details of the library shelving module”. Lithographic print of a drawing in pencil and pastel on paper; 60 × 50 cm; (Mezzetti 1995). Plate 7 (Folder n. 335/500)

comprehension of place, with everything in architecture that speaks of emotion and mystery” (Purini 2007, 7).

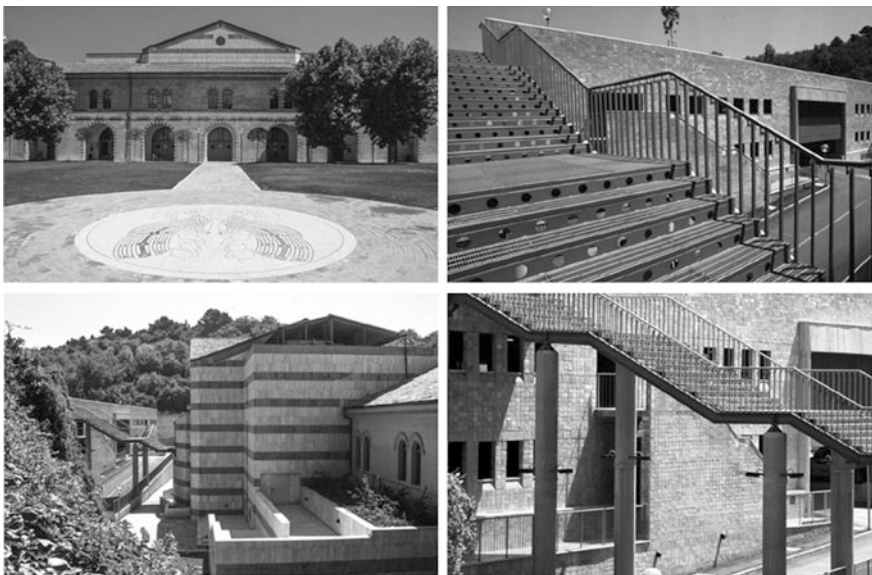
Purini’s essay highlights “four guiding lines” of research that connote Mezzetti’s talent for composition, recognisable in: the desire to conceive of and construct buildings with an organic quality; the intention to discover relations between the whole and the detail; the attentive transcription of the values of a building’s context; the accurate design of interior space. These orientations converge toward a system of ideas typical of those designers and builders—Vitruvian architects—who see form as the objective of building: “The synthesis of these four directions of research is a poetic that unites a solid theoretical base with an innate talent for composition, without ignoring a pronounced propensity toward experimentation that becomes a positive restlessness, an attitude bent on deciphering sites and contexts, on dominating difficulties, and a love for all things new”.

Working with the existing, according to this method of design, is the result of a process of investigation that generates new stimuli for design: “managing to intercept the themes that history has selected as it progresses signifies also being able to give one’s writing a narrative dimension, something that without a doubt occurs in the work of Carlo Mezzetti”.

A final aspect of this condition is specific to the project examined here, where the system of vertical connections plays a fundamental role: “stairs, walkways, opaque or transparent roofs, double heights, the insertion of backdrops screening views, with the effect of a *mise-en-scène* of subtly scenographic values, inscribe

within the building a system of spatial compressions and dilations, the localisation of perspectival vanishing points and shifts in scale that defines a building whose general composition is of notable architectural quality” (Purini 2007, 9). Finally, the relationship with drawing. Carlo Mezzetti is a “an assiduous and intelligent designer; he does not see representation as a simple, even if fundamental instrument of research. For him, as it was and is for other important architects, including Mario Ridolfi, Carlo Scarpa and Carlo Aymonino, the drawing is where the idea of architecture is offered up to the imagination as a vital nucleus, dense with possible evolutions. The crucible into which the various components of architectural form are fused into something perfect and lasting. Drawing as the form of what has yet to take form, but also as the eternal residue of a work of architecture, its simulacrum that escapes the flow of days and years, consigning the work itself to its own immutable perfection”.

In short, a “Vitruvian architect” whose works of architecture are marked by a great care for details and the design of interior space, “considered not only as fields of advanced technical and linguistic solutions, but above all as logical-poetic models of the entire building, precious fragments in which a cosmic echo must resound” (Purini 2007, 9) (Figs. 9 and 10).



**Fig. 9** Carlo Mezzetti. New faculty of economics in the former Villarey Barracks, Ancona. Exterior. Photographs by Antonella Salucci, July 2000



**Fig. 10** Carlo Mezzetti. New faculty of economics in the former Villarey Barracks, Ancona. Interiors. Photographs by Antonella Salucci, July 2000

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## Author Biography

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