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THE LANGUAGE OF IDENTITY BETWEEN UNIFORMITY AND VARIATION. THE FACADES ON PORTICOES AT PIAZZA VITTORIO EMANUELE IN ROME

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Abstract

The Commission in charge in 1870 of the "extension and embellishment" plan to adapt Rome to the status of Capital, identified the portico facade as the stylistic feature of the new identity language of national unity and Esquilino as a huge district with fulcrum in Piazza Vittorio Emanuele II. With the aim to recognise the morphological and stylistic variations in the context of the dictates of uniformity imposed by this typology, a study was conducted on the facades on porticoes that surround the square for approximately one kilometer. The study method took the survey of shape and size as a basic information nucleus integrated with the typologic-morphological analyses, while the graphic-geometric models were an operational modality and metalanguage for investigating the languages of project and construction. The study highlighted how the introduction of variations, albeit minimal, broke the rigid monotony, giving the architectural-urban landscape an overall harmony.

Keywords

Survey, Graphic Restitution, Graphic-geometric Models, Typologic-morphological & Graphic Analyses, Architectural Heritage

1. Introduction

In the framework of the documentation aimed at enhancing Rome's diverse and rich architectural heritage, a comprehensive analysis of the facades defining the magnificent Piazza Vittorio Emanuele II (Fig. 1), the focal point of the Rione Esquilino, was conducted. This study is part of a broader initiative aimed at enhancing the multiple identities of the city, recognising the crucial importance of preserving, both materially and historically, the urban fabric in its entirety.

Indeed, the square stands as one of the clearest testimonies to the "extension and embellishment" project, which was set up in 1870 in order to adapt the city, recently annexed to the Kingdom of Italy, to its new status as the nation's capital (Arbib, 1895, pp. 150-151). The Commission of architects and engineers, established on 30 September 1870 and chaired by Pietro Camporese il Giovane, identified the Esquiline as one of the city's areas of significant expansion due to its proximity to Termini Station, its relatively sparse urbanisation, and its abundant water sources (Arbib, 1895, p. 151; Insolera, 1959, 1993, p. 12).

However, the Commission went beyond merely designing an urban plan, characterised by a rigid grid, but also prescribed a specific facade solution - the porticoed palace typology - a stylistic choice, clearly influenced by the Savoy, which had been identified as the stylistic code of the new language of national unity to which Roman architecture was expected to conform.

Fig. 1: Aerial view of Piazza Vittorio in the Esquilino district (by Google Earth).

The typology of the palace on porticoes, a model that was not exactly common in Rome, was thus adopted for Piazza Vittorio Emanuele II, a huge open space, named after the first king of Italy, characterised by a very elongated rectangular shape (320 x 180 m), which disrupted the visual continuity of the Sistine axis connecting the Basilicas of Santa Croce in Gerusalemme and Santa

Maria Maggiore. An urban outsize defined by the perimeter of about one kilometre of block houses rendered uniformly monumental by the adoption of the porticoed building typology on the facade (Fig. 2).

Fig. 2: The main facade of the block between via Leopardi and via Buonarroti in a historical and a current photo (authors' elaboration)

In our opinion, despite the great presence of the square in the heart of the city, the palaces that delimit it are still inadequately documented, necessitating an in-depth analysis of their typological, morphological, and stylistic characteristics that are essential for their valorisation.

With the main objective of contributing to the understanding of the cultural value of this urban ensemble, the paper delves into the study of the porticoed facades of Piazza Vittorio Emanuele II, employing methodologies inherent to Representation and refining an investigative approach to facilitate the comprehension and interpretation of this heritage.

2. *Survey of shape and dimension*

The method employed for documenting and analysing the facades on the porticoes of Piazza Vittorio has centred on surveying their shape and dimensions as a primary means of gaining comprehensive insight into the physical aspects of reality (Ippoliti, 2000). This approach serves as the foundational nucleus upon which all subsequent analyses and interpretations are built. From this perspective, the survey acts as a fundamental framework around which other elements of knowledge are integrated. Enriched with additional elements of reality analysis that both precede and follow the survey process, this methodology yields a wealth of information essential for study, preservation, or interventions aimed at the built environment.

In this context, an integrated survey campaign was conducted, utilising methods, techniques, and instrumentation tailored to the specific objectives, characteristics of the object of study, and operational conditions. Aligned with the objectives, the primary data acquisition method chosen was the photogrammetric one, specifically Structure from Motion (Ippoliti, Meschini, & Sicuranza, 2015), with an accuracy target set at 3 cm, corresponding to a 1:100 scale, for defining the overall asset of the building. For detailed elements, such as architectural features and their constituent elements, a higher accuracy of 1.5 cm, consistent with a 1:50 scale, was aimed for.

To complement and validate the photogrammetric survey, a 3D laser scanning survey was conducted with two main purposes (Fig. 3). Firstly, laser scanning was employed for framing operations, capturing a sufficient number of notable points to serve as reference for photogrammetric measurements (Agnello, Albano, Avella, Cannella, Giordano, & Monteleone, 2015; Cianci, & Colaceci, 2022; José María Guerrero Vega, Roque Angulo Fornos, & Pinto Puerto, 2023). This encompassed scanning all facades of the square with widely spaced scans to record broad measures and heights of different levels of all blocks.

Secondly, detailed scans of two specific blocks, namely blocks XXV (between Via Foscolo and Via Machiavelli) and XXIV (between Via Machiavelli and Via Buonarroti), were conducted to verify the accuracy of the Structure from Motion method.

During the data acquisition campaigns, significant challenges were encountered, including

heavy vehicular and pedestrian traffic, particularly problematic for the photogrammetric survey due to the considerable size of the buildings. To mitigate these challenges, the acquisition and filming project were meticulously planned considering the instrumental equipment, the deep pre-understanding of the building's characteristics, and the operational conditions.

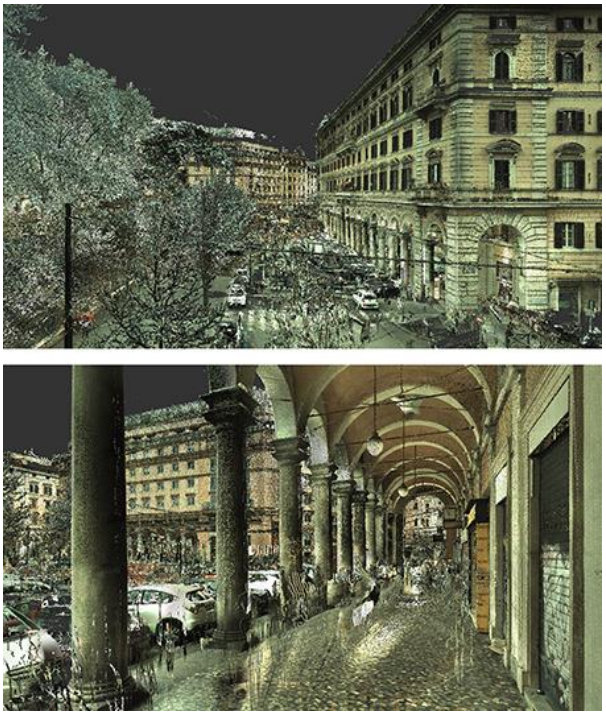

Fig. 3: The point cloud derived from the laser scanner survey (authors' elaboration).

Regarding the photogrammetric survey, a photographic acquisition campaign of the facades for each block was conducted. This involved employing both parallel-axis shooting schemes from a greater distance and convergent-axis shooting schemes from a shorter distance.

Parallel-axis shots were taken from stations positioned further away from the facades, typically on the pavement surrounding the garden perimeter, with 4 to 6 shots per station gradually increasing the inclination of the optical axis. Convergent-axis shots were captured from stations positioned closer to the fronts, usually on the outer edge of the pavement surrounding the block, with 8 to 10 shots per station increasing the inclination of the optical axis. Additional shots focused on corner and side elevations: the first with stations positioned further from the fronts, the second closer, all with increasing inclination of the optical axis.

The photographic campaign of the portico gallery posed greater complexity due to its configuration and lighting conditions. For each bay, an extended-field scheme was employed, arranging stations radially along dominant planes that characterise its structure. In corner bays, which have a different shape, two shooting schemes were used.

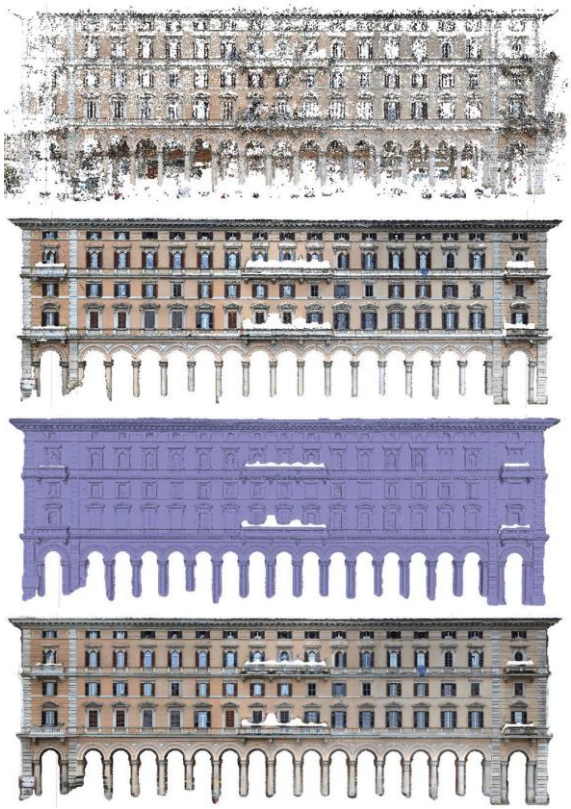

Fig. 4: The SfM process workflow from sparse cloud to textured mesh (authors' elaboration).

All shots, captured in RAW format (to correct exposure defects leveraging greater colour depth) and JPG, ensured complete photographic coverage with adequate overlap between consecutive shots ranging from 60% to 80%. Regarding data acquisition using 3D laser scanning, the 1x1 - 2x2 cm resolution (Δ ± 5 mm) was applied for detailed scans of the two blocks, and a the 5x5 - 7x7 cm resolution (Δ ± 2 cm) was utilised.

During data acquisition and initial processing, standard workflows were followed. For photogrammetric surveying, this involved post-production of photographs to rectify exposure defects, orientation, and verification of images with extraction of low-density point clouds,

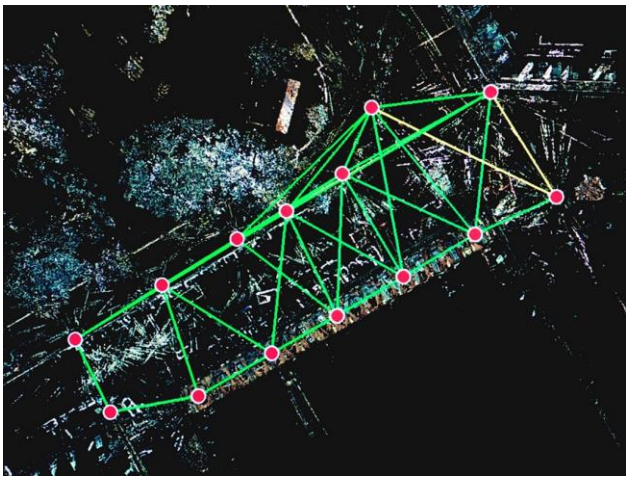

Fig. 5: Plan view of the laser scanner point cloud with the position of stations and their connections (authors' elaboration).

generation of dense clouds, scaling (using laser scanner measurements), accuracy control and validation, and noise removal (Fig. 4). For 3D laser scanning surveying, it encompassed alignment and registration of scanning sets, generation of coherent datasets, validation of relative metric accuracies, and noise elimination (Fig. 5).

In the subsequent data processing stage, for the photogrammetric survey, the point cloud was initially examined to identify and resolve areas with considerable gaps. Automatic processing of polygonal models (mesh) and static renderings with high geometric and chromatic resolution was then conducted to produce rectified orthophotos.

In the 3D laser scanning survey, significant points were extracted for local framing and georeferencing of all blocks. Additionally, from dense scans, an appropriate number of horizontal and vertical slices were extracted to verify the accuracy of the photogrammetric survey for blocks XXV and XXIV, which yielded successful results.

3. *Morphology, typology and graphic-geometrical analysis*

The phase following data acquisition and processing involved critical interpretation and elaboration of various representations to describe, understand, and communicate the acquired knowledge, making volumes, geometries, measurements, material qualities, and chromatic characteristics of surfaces, explicit.

Among these representations, there is a primary series, termed "al tratto" (line drawing) that comprised elevations, sections, plans, and horizontal profiles, with scales ranging from 1:100 to 1:50. These were derived from the interpretation of slices obtained through sectioning clouds with vertical and horizontal planes at significant points, and/or orthophoto projections.

From these technical drawings, additional representations were generated through graphic-geometrical analysis aimed at deeper comprehension of the artifact (Fig. 6). Specifically, this was undertaken to investigate the generative criteria of formal configurations and to identify relationships and variations between typological indications dictated by the plan and the underlying construction projects (Fasolo, 1995; Docci & Chiavoni, 2017).

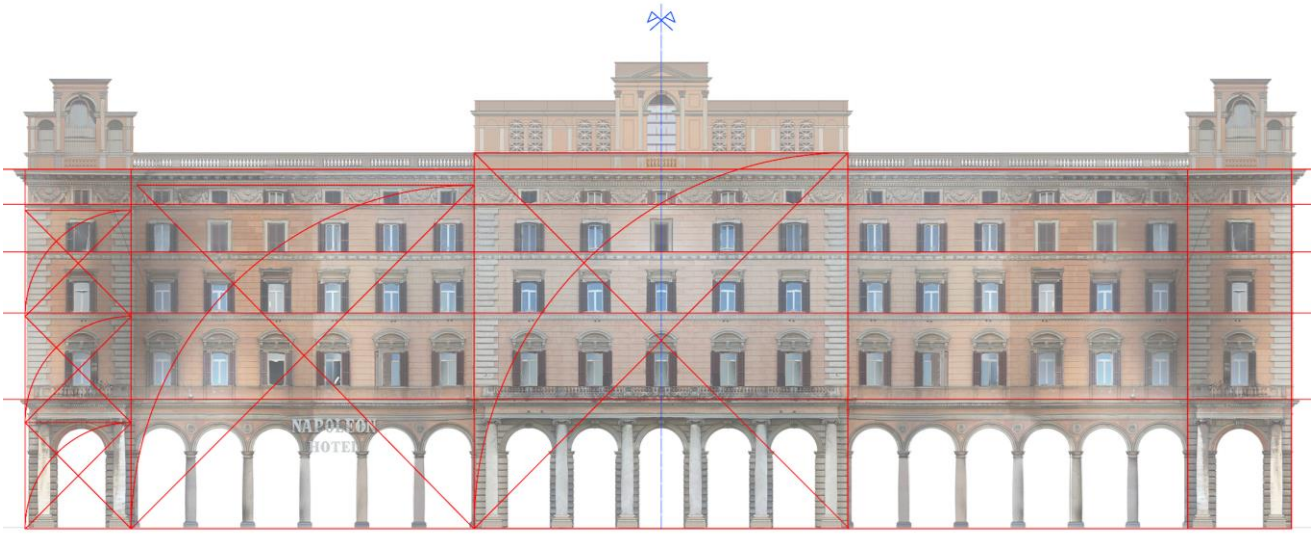

Fig. 6: Proportional analysis of the facade of block XXIV (authors' elaboration).

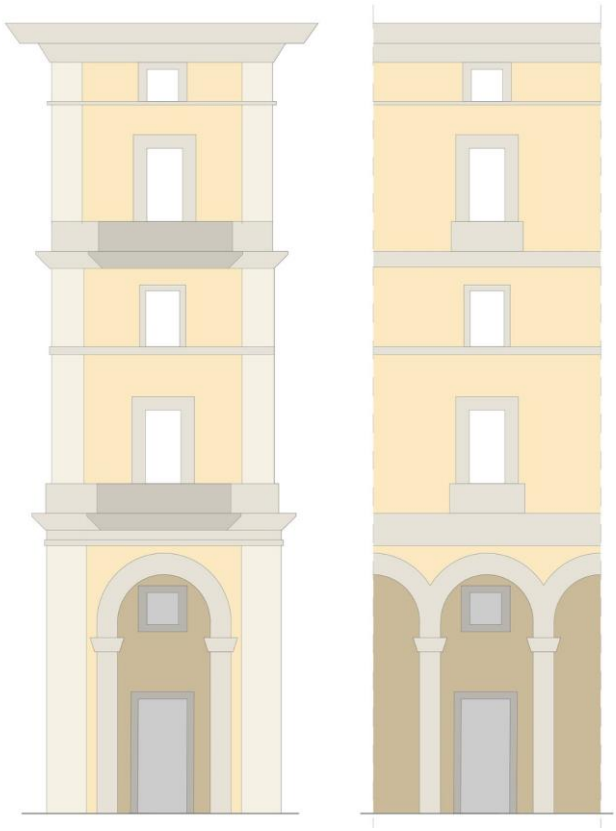

Fig. 7: Simplified schemes of the corner and standard bay (authors' elaboration).

With the main objective of identifying the margins of freedom, i.e. the morphological and stylistic variations, in the context of the dictates of uniformity imposed by the adoption of the facade on porticoes typology, the investigation methodology adopted has therefore assumed the critical and operative device of graphic-geometrical analysis as the privileged one for tackling the complexity of architectural language, and typology and morphology as the main categories of analysis. Graphic-geometrical analysis and the graphic-geometrical model were respectively the operational mode and metalanguage employed to explore the visual languages of design and construction, decoding their sign systems and comprehending the different messages they convey (De Fusco, 1966a, pp. 5-13; De Fusco, 1966b, pp. 49-66; Dorfles, 1969, pp. 27-40; Garroni, 1970, pp. 5-33; Purini, 2012).

Starting with an analysis of the adopted typology - the facade on porticoes - and proceeding to morphological analysis of the building, it became possible to identify both compositional rules of individual facades and constituent elements, as well as relational rules between different facades, discerning elements of permanence and variability (Figs. 7-8).

Typology and morphology are intricately linked categories of analysis, with each referring to the other, and together they allow a deeper understanding of the phenomenon. Typological analysis involves the study of types, where a type is a concept that precedes shape, even though it can be solely understood through the study of shape. Therefore, no type can be identified with a shape, although all shapes can be traced back to types.

The concept of "type" "does not so much represent the image of a thing to be copied or imitated entirely, but rather the idea of an element which must itself serve as a rule" and, unlike the model, the type is "an object according to which everyone can conceive works that do not resemble each other. Everything is precise and given in the model; everything is more or less vague in type" (Quatremére de Quincy, 1832, v. 2, p. 629).

The concept of "type" encompasses the entirety of manifestations within the built space, ranging "from the characteristics of building materials to broader territorial features" (Caniggia, 1976, 1979). Therefore, it is not a universal and ahistorical category. On the contrary, in its physical concretisation, it results in a single object, modifying itself in relation to place and historical moment and reacting "dialectically with technique, with function, with style" (Rossi, 1984, p.33).

Additionally, a "type" can be also understood as an "internal structure of shape," (Argan, 1965, p. 77) representing a condensed set of potential variants that are then expressed in specific formal constants within a given project or construction. This notion underscores the idea that each instantiation of a type is unique yet maintains underlying structural similarities (Garroni 1970, p. 17).

The morphological approach facilitates the examination of how the abstract nature of a type transforms when applied in concrete contexts. Through an analysis of the physical structures of buildings and urban spaces, this method explores the shape via graphical analysis, aiming to uncover inherent geometries and proportions to identify both enduring qualities and variations.

This approach proceeds from the general to the specific, investigating spatial relationships between parts and their relations to the whole,

Fig.8: Rectified image of the corner bay of block XV (authors' elaboration).

aiming to understand the overall organisation, as well as the qualities of variation and interrelation among its constituent elements.

In the present study, a combination of graphic-geometric analysis and the integration of typological and morphological approaches was

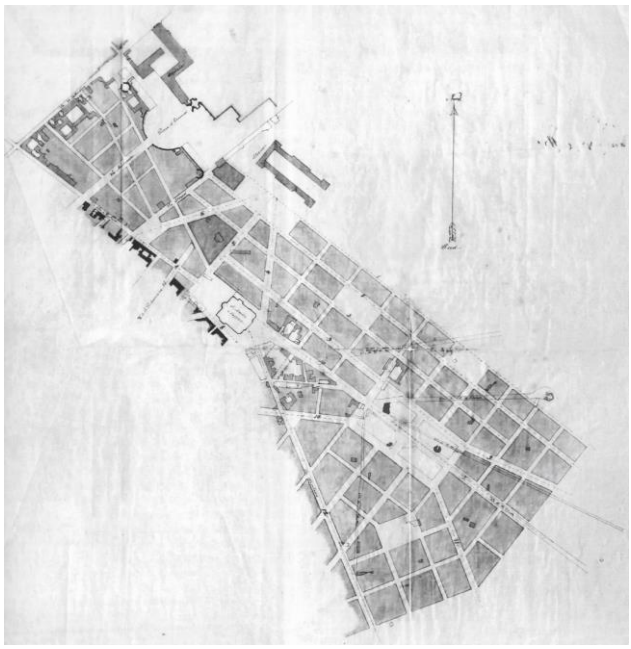

Fig. 9: The project for the Esquiline area approved in 1871 (ASC, 1872).

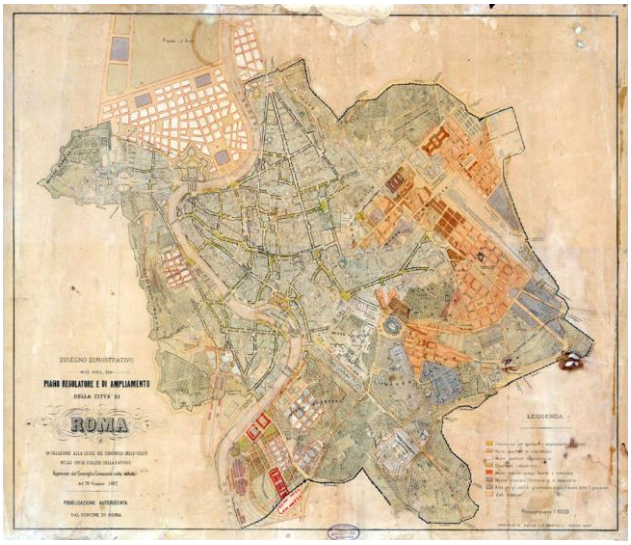

Fig. 10: The Rome Master Plan of 1883 (ASC, 1883a).

employed. Initially, the focus was on investigating the generating principles behind the formal configuration and the compositive-typological dynamics prescribed by the plan. Subsequently, building upon the interpretation of survey data, morphological analysis was conducted on the individual "objects" - the porticoed facades - as well as their constituent parts. The objective was to comprehend the relationships and variations within these elements in the context defined by the typology.

4. The project for Piazza Vittorio Emanuele II

The project for the Esquiline area, situated between Santa Maria Maggiore and Santa Croce in Gerusalemme, was designed by architect Pietro Camporese (1792-1874), architect Antonio Cipolla (1823-1874), and engineer Alessandro Viviani (1825-1905), and received approval on 14th September 1871 (Fig. 9). This project, subsequently confirmed by the Master Plans of 1873 (signed by engineer Alessandro Viviani) and 1883 (Fig. 10), planned to build a new district spanning over 60 hectares in an area characterised by parks, gardens, orchards, vineyards, and suburban villas owned by the main Roman families (Fig. 11) (Girardi, Gorio, & Spagnesi, 1974; Manfredi, 2015; Severino, 2019).

The ambitious urban renewal initiative included, among broad avenues and squares, the construction of representative palaces and high-density residential blocks capable of accommodating approximately 25,000 inhabitants, in a city with just over 200,000 residents. It aimed to give an answer to the housing crisis by providing residences for numerous families, particularly officers and employees required for the new administration.

The construction around Piazza Vittorio Emanuele II was partitioned into large lots of varying dimensions. The long side between Via Leopardi and Via Foscolo was divided into three blocks (Nos. XXIII, XXIV, and XV), with the central one being larger. Conversely, on the long side between Via Mamiani and Via La Marmora, only two blocks (Nos. XII and XIII) were planned due to partial occupation. The shorter sides comprise both two blocks: blocks Nos. XV and XIX lie between Via Principe Eugenio and Via Emanuele Filiberto, while blocks Nos. XVII and XXI are situated between Via Napoleone III and Via dello Statuto (Fig. 12).

In May 1881, the "Impresa costruttrice della Piazza Vittorio Emanuele", comprising the companies Mariotti, Frontini, and Geisser, presented the project drawings for the construction of buildings to the Capitoline administration. Between October and November of the same year, the Municipal Council and the Building Commission approved the project plans. Finally, on 28 December, an agreement was contracted between the municipality and the company for the construction of buildings with porticoes in the square within six years (ASC, 1881b, 1881c).

Fig. 11: Esquilino represented in a plan by Giovanni Battista Nolli, 1748, Tables 38, 39, 50 and 51.

Fig. 12: Aerial view showing blocks according to the project numbering (authors' elaboration).

To ensure compliance with the "embellishment" standards of the Capital of Italy, the agreement meticulously detailed typological-architectural features, dimensions, minimum and maximum heights, number of floors, finishing materials, etc.

It stated that all buildings must adopt the porticoed typology on the facades facing the square and in corner solutions. Porticos, designated for public purposes, were required to be 7 meters high and 6 meters deep, and to have piers with pillars covered in freestone or granite columns.

Fig. 13: Axonometry of the corner solution of the block XXIV and XXV (authors' elaboration).

For reasons related to symmetry, elevations of buildings on opposing blocks had to be identical. Buildings were required to have a minimum height of 24 meters and a maximum of 3 floors plus the portico, with the option for a mezzanine in both the portico and the crowning part. The blocks in the centre of the longer sides of the square (blocks XII and XXIV) were intended to be more grandiose, with at least the central portion having increased height.To ensure stylistic uniformity, drawings of ground floor plans and "typical" elevations were attached to the agreement. Three types of plans were specified for adherence by the buildings: the first for blocks XIII, XXV, and XXIII, the second for blocks XV and XIX, and the third for blocks XII and XXIV (ASC, 1881a).

Although the reference plans attached to the agreement were unsigned, the contemporary press (La Capitale, Gazzetta di Roma, 2-3 gennaio, 1882, p. 3) attributed the most monumental blocks to Gaetano Koch (XII and XXIV), those on the edges of the long sides to Giulio Podesti (XIII, XXIII, and XXV), and those on the short sides to Giovanni Riggi (XV and XIX) (Severino, 2018, p. 270). No indication was provided in the agreement for block XVIII. Nevertheless, the project submitted in March 1882 was approved by the city council, despite the building under construction being one storey higher than planned (ASC, 1884).

Initially, block XXI was excluded from the agreement as it had already been partially built by the impresa Esquilino according to a different project. However, in October 1884, the same company committed to modifying the existing construction and erecting a building on porticoes with monolithic granite columns, fully in line with the adjacent building on block XVIII (ASC, 1883b).

5. *The analysis of the porticoed facades in Piazza Vittorio Emanuele II*

Based on this approach, the analysis of the facades on porticoes of Piazza Vittorio was

conducted by comparing the current state data acquired from the survey with the project data gathered through historical, bibliographic, and archival research.

Through this analysis, blocks XVIII and XXI were disregarded as they were not part of the 1881 Convention, while block XIX, located between Via Emanuele Filiberto and Via Conte Verde, was excluded due to reconstruction in 2012 following severe static stability issues. It is interesting to remember that a significant collapse affected block XIII as early as 6 August 1885. The investigative commission, chaired by Engineer Brauzzi of the Genio Civile, in its report attributed the causes of the collapse to construction defects and the use of poor-quality materials. Furthermore, he noted that the situation was generalisable to the other buildings as well (ASC, 1888).

This comparative analysis advanced the understanding of specific design and construction methods through graphic-geometric analysis, aiming to identify the geometric framework as the generative element of both typological categories and formal configurations. The goal was to unravel the complexity of interconnections and references, and reconstruct the genesis and progression between design and construction (Fig. 13).

Typologic-formal matrices were explored, progressing from the general to the particular, following a logic of increasing complexity with the ultimate aim of re-comprehending the architectural-urban object as a whole, in light of the rules and relationships between individual parts and between these parts and the whole.

Identifying the geometric framework underlying the compositional dynamics of the facades facilitated the recognition of hierarchies and relationships between elements and masses, which involved disassembling the spatial "box" to identify constituent elements with characteristics of evidence and continuity. By comparing and bringing together these constituent elements based on similarities, compositional elements with serial and syntagmatic value were identified – that is, those syntactic units endowed with autonomous function (Argan, 1965).

Geometric diagrams, modular and proportional relationships were then utilised to identify the system of rules governing the facades' relationships between typological design and morphological configuration.

The primary objective was to seek hierarchical relations between component parts within the facade, as classical architecture typically resolves figurative balance between the various parts as part of a rigorously symmetrical layout.

This method allowed for the concrete identification of the main compositional elements for each block, including those governing: volumetric articulation (such as the characteristics of different bays: “typical” ones, those along the symmetry axis, and corner bays), “connection to the ground” (involving the portico - arched or architraved – with the architectural order, and the surface of the roof's intrados), elevation (comprising types and architectural components of string courses and windows, as well as the number of stores), and “connection to the sky” (including cornices, altane, and mezzanines).

Analyses on these elements (considered individually and upon their mutual relations) were conducted by comparing standard projects attached to the 1881 Convention – signed between the Impresa costruttrice della Piazza Vittorio and capitoline administration - and survey data, aiming to highlight design process freedoms inferred from the comparison between typological indications and morphological configurations.

The study's main objective was to delineate design process margins of freedom, which can be deduced through comparisons between plan-imposed typological indications and the realised morphological configurations. The interpretations and analyses results are described below, grouping blocks according to the 1881 Convention's dictates, gradually emphasising similarities and/or dissimilarities between what was indicated and what was realised.

5.1 Blocks XXV, XXIII and XIII

The plan for the edification of Piazza Vittorio stated that the buildings situated externally on the longer sides adhere to the same project, attributed to Giulio Podesti (Fig. 14).

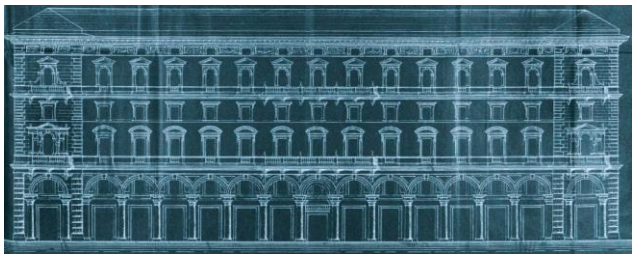

Fig. 14: The elevation from the project attributed to Giulio Podesti (ASC, 1881c).

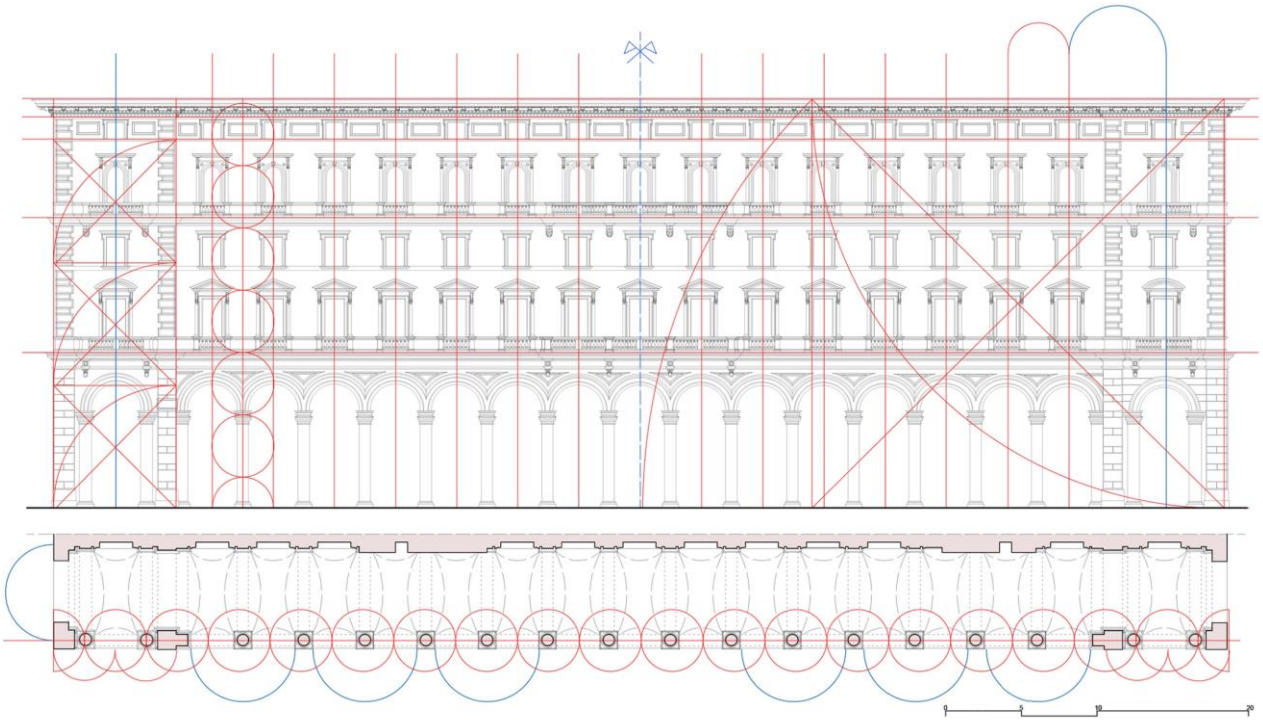

Fig. 15: Geometric-proportional analysis of the facade of block XXV (authors' elaboration).

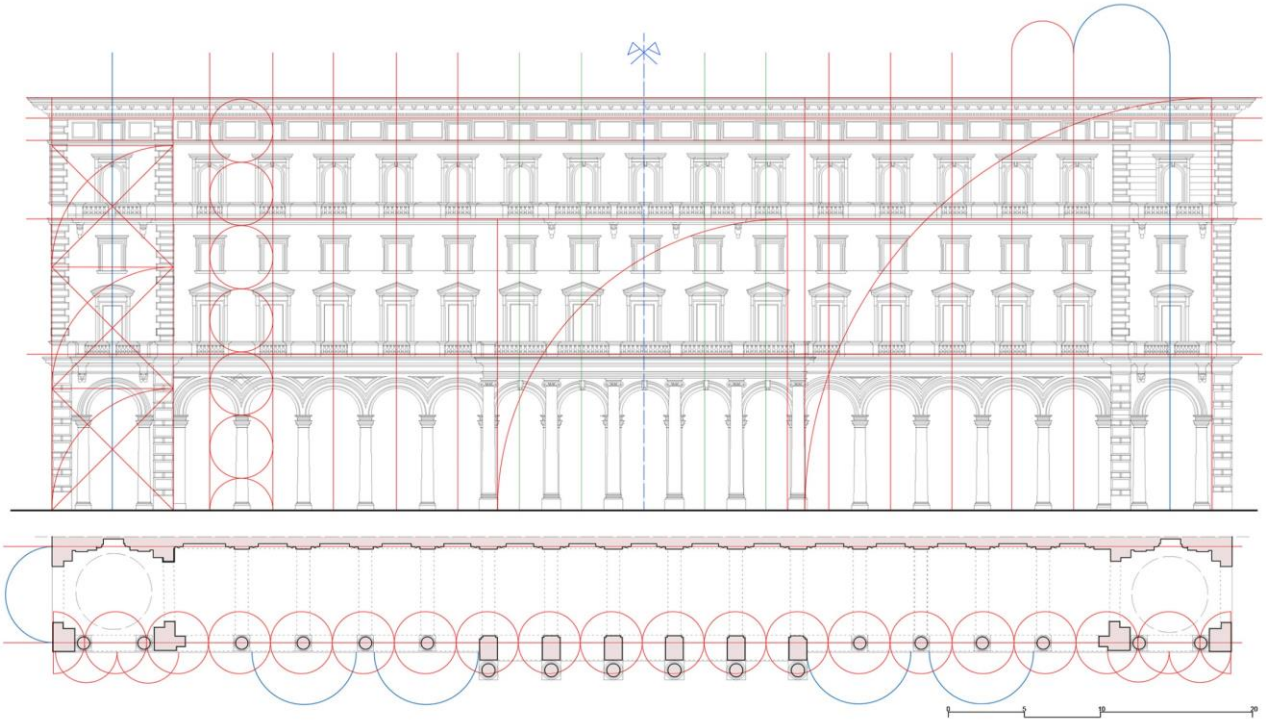

Fig. 16: Geometric-proportional analysis of the facade of block XIII (authors' elaboration).

However, the analysis of the current state revealed significant discrepancies in the constructions compared to the plan specifications, which were less pronounced in blocks XXV and XXIII situated on the edges of the side between Via Foscolo and Via Leopardi (and which appear almost identical), but more evident for block XIII on the opposite side, between Via La Marmora and Via Ricasoli.

First, among the main differences there is the number of bays into which the facades are divided, with 15 in the planned design compared to the 17

realised. As a result, the porticos, featuring arches on columns, appear much slimmer, with significantly altered proportions (Figs. 15-16).

Another disparity lies in the roofing: the project envisioned pitched roofs with pavilion terminations at the corners, while the actual construction features flat roofs.

Further differences are evident in the types and architectural parts of the windows, including the Serlian windows foreseen by the project's corner solutions but not realised, or the sequence of components, which in the typical bays of the project are arched tympana, architraves, triangular tympana, architraves, while they are tympana, architraves, framed arches, architraves, in the built architecture.

According to the scheme imposed by the "typal" facade, all buildings have a strictly symmetrical layout, accentuated by the treatment of the corner bays and balconies on large corbels framing the central bays. However, while in blocks XXIII and XXV as designed, the balcony extends over three bays, in block XIII it spans five. More generally, all five central bays, emphasised by a different design of the portico with arches on thick pillars juxtaposed with giant Ionic orders on attic bases on the side facing the square, are notably different from the project.

In all blocks, the front, just over 27 meters tall, is vertically articulated into 17 bays and horizontally into three bands separated by stringcourses through a strict geometric modular subdivision.

The first band is characterised by the portico, in whose gallery the entrances to the residences and shops on the ground floor and a mezzanine may be found. In the standard bays of all buildings, this features externally moulded round arches supported by Tuscan order granite columns with pulvino. However, internally slightly protruding pillars, placed in line with the columns and repeating the same order, divide the space into elongated rectangular bays. The treatment of the portico facade in the corner solutions of all buildings is also similar: the bays are slightly projecting and surrounded by ashlar.

The main differences lie in the intrados of the portico roofs: in blocks XXV and XXIII, they are sail vaults, while in block XIII, the ceiling is coffered, with beams supported by corbels, except in the corner bays where there are small domes on spherical pendentives.

The articulation and details in the following bands, however, do not present substantial differences between the buildings.

In the second band, which extends for two floors, rectangular windows framed by moulded cornices open up in axis with the arches below, including those at the lowest level, with triangular tympana in the central bays and arched tympana in the lateral ones.

In the third and final band, concluded by a projecting cornice on corbels, sometimes with ovules and dentils, there are again two levels: in the first, slender arched profile windows, with a keystone corbel, framed by a squaring and cornice on corbels, while in the second, small approximately square windows are arranged between panelling of cornices.

5.2 Blocks XXIV and XII

In accordance with the Convention of May 1881, the XXIV and XII blocks, located in the centre of the longer sides of the square, had to be distinguished from the others by a "more grandiose" character, with increased height, at least in the central section, in order to break the monotony introduced by the considerable longitudinal dimension of the square.

The building permit for block XXIV was issued on 13 May 1882 to engineer Giovanni Frontini on behalf of the Impresa della Piazza Vittorio Emanuele, and the building, spanning over 100 meters in length, was already completed by 1885. The project for block XII was presented in August 1883 by engineer Emanuele Zanotti, on behalf of the Impresa della Piazza Vittorio Emanuele, with the building permit issued in November of the same year.

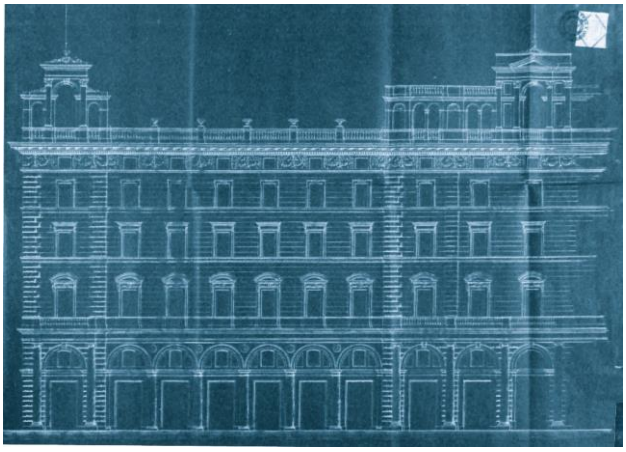

Fig. 17: The elevation from the project attributed to Gaetano Koch (ASC, 1881c).

Given the significance of these structures, the facade design was entrusted to Gaetano Koch (Fig. 17) to ensure, as established by the Convention, buildings apparently identical, despite different planimetric systems due to the different clients.

The comparison between Koch's project (though only for the right half of block XXIV) and the survey of the actual state of the buildings of blocks XXIV and XII demonstrates a substantial coherence between what was prescribed by the plan and what was built.

The facades, set on a central axis of symmetry, are vertically divided into 19 bays and segmented into 4 sections by slightly rough-hewn ashlars, extending from the ground connection to the roof cornice (Fig. 18).

Framed by the ashlars, the five central and the corner bays project outward from the facade's edge. These overhangs, accentuated in the crowning part by the broken shape of the cornice, are further emphasised by the giant Ionic order, on columns, whose architrave provides support for the balconies adorned with balustrades on the main floor. The order, on an attic base and low plinth, is placed in front of ashlar pillars supporting the portico arches of the central and corner bays. In the recessed sections of the facade, the portico features arches on columns with a Tuscan order.

The space of the portico is internally divided into rectangular bays elongated by architraved and slightly protruding pilasters (a particular pillar engaged into the wall), aligned with the columns, and repeating the same order. Between the pilasters, entrances to the residences and shops are situated, while above the architrave, windows framed by mouldings are found.

The flat surface of the portico gallery's ceiling is decorated with framings and wall panels, divided into portions by beams supported by double corbels. However, in the corner bays the ceiling intrados is resolved with small domes on sail vaults.

Moving upward, the facades extend beyond the portico's basement area, horizontally divided by stringcourse frames into four bands. In these bands, smaller windows and gradually simplified frames are observed from the main floor to the attic: moulded cornices concluding with architrave on modillion with masks and festoons, moulded framings concluded with architrave on modillions, moulded framings between festoons and putti.

Above the projecting cornice on corbels, located at a height of 27.80 metres, the connection to the sky is resolved by altane aligned with the overhanging portions. The design of the altane, reaching a maximum height of almost 37 metres, differs between the central bays, featuring a

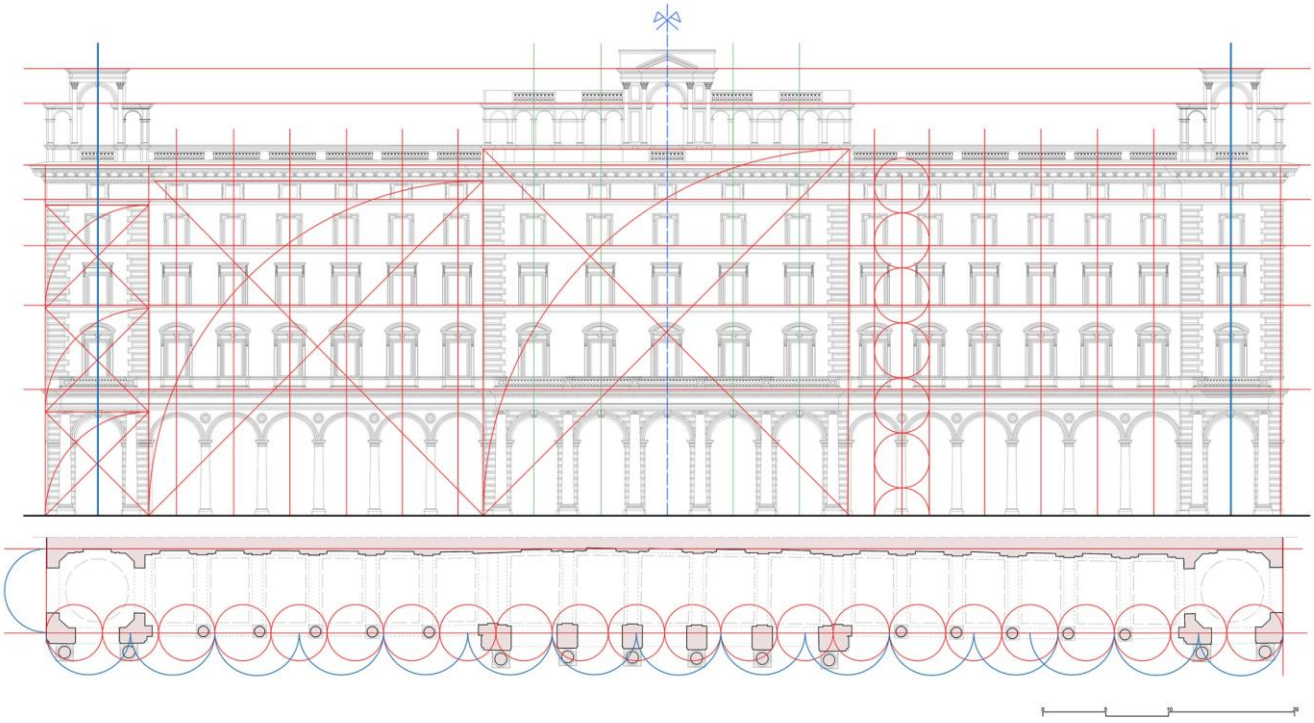

Fig. 18: Geometric-proportional analysis of the facade of block XXIV (authors' elaboration).

tympanum, and the corner ones, featuring an architrave.

5.3 Block XV

The Convention governing the plan of Piazza Vittorio established that blocks XV and XIX, situated on one of the short sides, adhere to the project attributed to Giovanni Riggi (Fig. 19). As already mentioned, block XIX is excluded from this study due to its complete reconstruction in 2012.

As for blocks XXIV and XII, in this case the comparison between the project and the current state revealed no substantial differences.

The design of the facade, divided into 13 bays, adheres to a strict symmetry, accentuated by the balcony framing the three central bays and especially by the corner solutions (Fig. 20).

These corner solutions, accentuated by smooth ashlars, unlike all other buildings, in fact span three bays and feature a figuration that recalls a triumphal arch

Fig. 19: The elevation from the project attributed to Giovanni Riggi (ASC, 1881c).

The basement area of the corner solution presents a tripartite division marked by a giant Tuscan order, situated on pillars with an attic base on a high pedestal, with an architrave and frieze

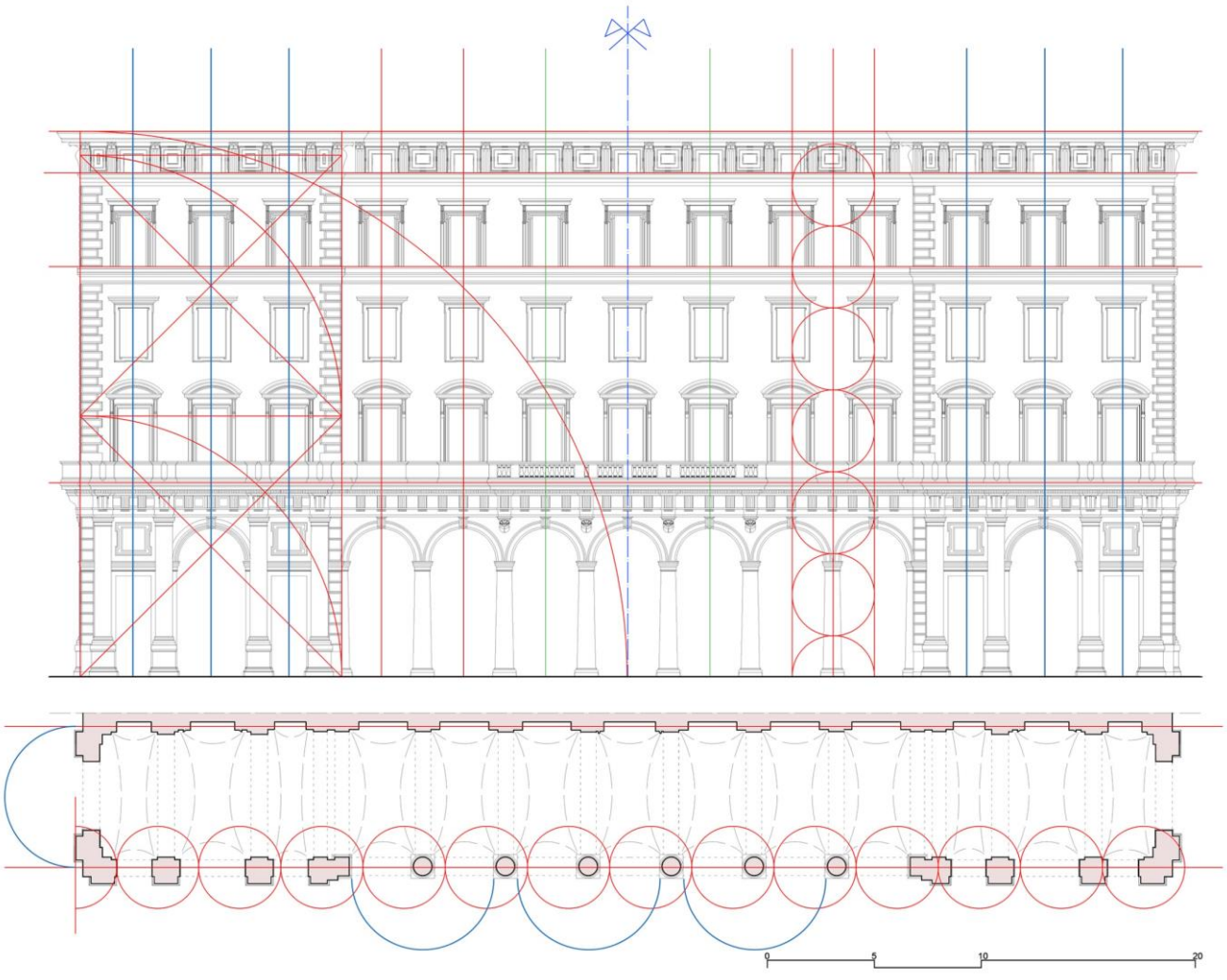

Fig. 20: Geometric-proportional analysis of the facade of block XV (authors' elaboration).

with triglyphs that support the balcony on the piano nobile. The portico of the central bay features round arches with pulvino, on Tuscan pillars. Symmetrically, on the two following bays, there are rectangular openings surmounted by almost square windows.

The portico of the typical bays has round arches with pulvino on granite columns of the Tuscan order. In the gallery, entrance halls to residences and shops on the ground floor and a mezzanine are situated. Slightly protruding pillars, aligned with the portico columns and repeating the same order, divide the space into elongated rectangular bays with sail vaults in the intrados of the ceiling surface.

The front, approximately 25.50 meters high, is horizontally divided by cornices into three bands. In the first band, two rows of windows with moulded cornices are observed, the first of which conclude with lowered arches on corbels, while the second ends with an architrave. In the third band there are windows framed by moulded cornices concluded with an architrave, while in the fourth and final band, corresponding to the mezzanine, we can find almost square windows arranged between framed wall panels, opened between large corbels that support the crowning cornice.

6. Conclusions

The methodology employed in the examination and comprehension of the architectural heritage of the facades of Piazza Vittorio Emanuele II in Rome heavily relied on Representation as the privileged investigation tool, due to the intimate connection between the language of architecture (Purini, 2012) and the language of architectural representation, where the latter serves as a metalanguage of architectural language (Morris 1963, pp. 175-176). This stringent relationship ensures the validity of transitioning from the object (architecture) to a system of analogous models, as the equivalent of the architectural work "on which those semiological operations can be carried out which are usually carried out on the authentic work" (Dorfles, 1969, p. 38). Among this system of models, graphic and geometric-analytical models are particularly relevant (Garroni, 1970), as they are based on isomorphisms between the partition of the physical space of the object and an "adequately structured set of geometric figures" (Fusco 1976, p. 33).

Fig. 21: Detail of section, elevation and plan of the corner bays of block XXV (authors' elaboration).

The study method for the documentation and analysis of the facades on the porticoes of the square focused on shape and dimension as a founding cognitive moment and basis on which we can conduct all analyses and interpretations (Fig. 21). Integration of this information with typological and morphological analytical approaches allowed us to develop a complete and in-depth understanding of the square's architectural and urban significance. Finally, the graphic-geometric analysis and the graphic-geometric model were respectively the

Fig. 22: Analysis of the modularity of the main facade of block XXV.

operational modality and the metalanguage to investigate the visual languages of projects and construction (Fig. 22).

In this context, the facades and their constituent parts underwent analysis and control through the critical and operational graphic-geometric analysis, while the typological classifications and graphic-geometric models verified the different hypotheses and interpretations. The formal configurations were analysed through a rigorous graphic-geometric control, while the comparisons between typology and shape facilitated a progression from general to particular, "deconstructing" and "reconstructing" the object of study to activate the iterative processes of abstraction/discretisation necessary for understanding the built space.

The main objective of the study was to identify the margins of freedom, namely morphological and stylistic variations, within the context of uniformity imposed by the adoption of the portico facade typology.

In this context, from a brief observation of the facades facing the square, a remarkable uniformity emerges due to the impositions of the Conventions of May 1881: the symmetrical systems and the mirrored elevations, the homogeneous heights and the same number of floors, the succession of windows with apparently indistinguishable moulded framings and, above all, the almost endless sequence of arches on columns of the porticoes on the ground floor.

However, a more careful analysis made it possible to highlight the subtle minimal margins of

freedom adopted in the constructions with the introduction of the necessary qualitative variations to alleviate the excessive rigidity. Legible variations in the central bays (e. g. with the introduction of the giant order, overhangs, balconies etc.), in the corner solutions (with one or three bays, with rough-hewn or smooth ashlars, with or without balconies etc.) and in the declinations of architectural order and decorative details. These minimal variations break the rigid monotony allowing us to appreciate an overall visual harmony of the architectural-urban landscape of the square.

The study elucidated how the main compositional elements - those regulating the volumetric articulation (typical, central and corner bays), the connection to the ground (the portico, with arches or architrave, with the architectural order and the surface of the intrados of ceiling), the elevation (typologies and architectural parts of the stringcourses and windows), the connection to the sky (cornices, altane and mezzanines) - are combined according to typological rules and geometric instructions. However, these combinations rely on mutual necessity traceable in the stylistic code of the artefacts. This stylistic feature delineates adherence to a particular system of rules, embodying specific qualities and cultural values that reflect Rome's newfound status as the Capital of Italy.

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