THE CITY WALLS OF MILAN AND THEIR IMPACT ON THE URBAN FORM OF THE CITY

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ABSTRACT: This paper examines the city fortifications of Milan and their everlasting impact on the urban form and identity of the city. Being one of the most significant Italian cities, Milan has gradually and substantially transformed in the context of the change and later removal of the city's fortifications. The contribution focuses on the development of the defensive walls, their gradual alteration, and the new utilization of the former fortification sites and their impact on the urban and architectural character of the city. The research addresses other phenomena related to the city walls, and particular emphasis is laid on the influence of the original street network on today's urban layout. The research methodology consists of visual methods, field study, and literature review. Through exploration of the physical remains and the urban memory and urban patterns of the city in dialogue with current and historical maps, the paper accentuates the relevance of the contemporary approach in the framework of the imprints of historical urban forms. Based on the research, the paper's conclusion recommends emphasizing the historical context of the site and the genius loci in proposed designs of the former fortification sites.

KEYWORDS: fortifications; conversion; urbanism; architecture; history

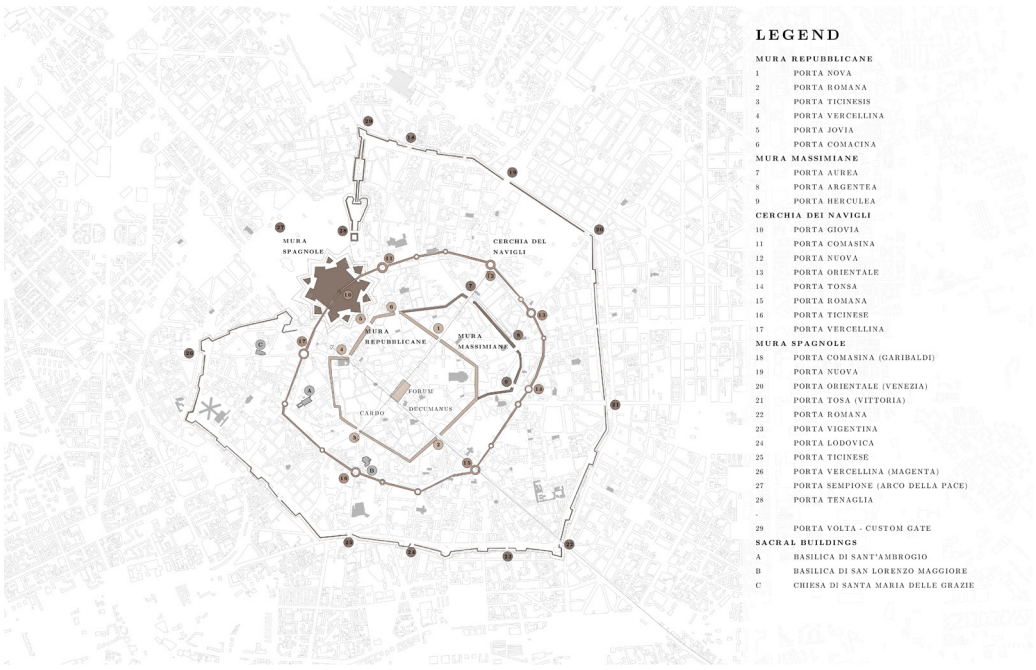
INTRODUCTION

Fortifications and city walls have been a part of urbanization and habitation since the dawn of human civilization and culture. Being more than bare defensive structures, historically, city walls have represented the power, value, and status of the settlements they surrounded. Fortifications have defined the urban form, both physically and symbolically, shaping the compact cores of cities across historical epochs. Among the oldest known urban settlements is the biblical city of Jericho, while Jerusalem also holds ancient urban significance, with its history chronicled in biblical texts. Beyond the original city of Jerusalem, the concept of the New Jerusalem, especially in the Western world, has remained predominant as a flawless urban model – a vision of sacred perfection [1]. City walls delineated not only the tangible limitations but also the boundaries of a religious and communal kind. These structures, in connection with the nearby sacred places (loca sacra), created what was known as the murus protectionis – a symbolic and defensive ring imitating the sacred cities of Jerusalem or Rome [2].

The paper focuses on the city of Milan, where several rings of city walls can be found, subsequently built throughout history. While traces of these walls are not always evident in the current urban layout, their legacy has continued to influence the structure of the city. Preliminary field research revealed a tendency for radial growth of Milan over time. A recurring topic was the vicinity of significant churches to historical fortification circuits, suggesting a deeper geometric and symbolic relationship. This research aims to investigate the long-term influence of the historical fortifications on the recent urban form of Milan. During our research, we sought answers to the following questions we had set ourselves: Has the original layout of Milan influenced its current urban network? To what extent did the fortifications shape the city's development? Do current urban planning and architectural interventions in the context of former fortification areas offer practical value to the city today?

To address these questions, a blended methodological framework was used, combining field study, visual methods, and a literature review. The observations were documented during an in-situ field study of Milan, focusing on identifying remnants of fortifications and analyzing their relationship with surrounding ur-

Fig. 1.: Map of Milan with designated city wall rings and gates (Author of the map: Lenka Volná [5])



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[1] This military alliance secured Vladislav II the non-hereditary royal title for the Czech lands in 1158, and according to Dalimil's chronicle, the Czechs earned their lion emblem. [6].

ban aspects and the cityscape. These findings were supported and interpreted with the help of historical maps and current mapping tools such as Google Maps, Google Street View, and Cadmapper. The visual methodology consisted of digital sketches and photographic documentation, and all figures were created by the authors. The map in Figure 1 was created using CAD software and highlights the successive rings of Milan's fortifications along with their gates. This map serves as both a means to designate and present historical layers of urban structure and as an analytical tool for the interpretation of urban patterns in Milan's cityscape.

MAIN PART

Historical Context, Layering, and Historical Tendencies in the Area of Former City Fortifications

The area of current Milan was settled by the Gauls from the 6th century BC. Following its conquest by the Romans in 222 BC, the settlement of Metlaun was transformed into the castrum called Mediolanum [3], which expanded into a city following the Roman scheme of a castrum. The city fortifications were constructed in a square layout, intersected by two main axes, the decumanus (southwest to northeast) and the cardo (southeast to northwest), accessed through gates with watchtowers [4]. The earliest defensive walls of the Roman castrum, known as the Mura Repubblicane, were raised in 49 BC. This fortification system included six main gates [5] – see Figure 1 for their names and locations. A few centuries later, Roman walls were expanded by the Mura Massimiane, which added three new city gates [5] – see Figure 1. Traces of the Roman urban grid and the fortification outlines of the original castrum are still evident in the historical core of Milan, as in other cities, e.g., in Bologna, Florence, and Vienna [1]. It can also be observed in Figure 1 that the cardo and decumanus are still identifiable and that later gates adhere to the same pattern – Porta Nuova (7,12,19) connects to the cardo, while Porta Romana (2,15,22) connects to the decumanus.

Following a brief period of decline after the fall of the Western Roman Empire and the barbarian invasions of the 6th century, Milan reemerged as a key northern Italian city-state. Throughout the Middle Ages, the city gradually grew and expanded concentrically around the Roman urban nucleus [4]. The partial destruction of Milan by the armies of Frederick I, Holy Roman Emperor, in 1158, with the help of Czech troops, marked another milestone in the history of Milan's city walls[1] [6]. A new perimeter wall circuit was erected, surrounded by a moat filled with water from the Navigli Canal – Cerchia dei Navigli [7]. The final form of the defensive wall included main gates (designated in Figure 1) and about a dozen secondary gates, called pusterle, of which the Pusterla di Sant'Ambrogio depicted in Figure 2 has been preserved. Of the main gates, Porta Ticinese (Figure 3, 16) and Porta Nuova have been preserved to this day.

Under Spanish rule in the early 16th century, Milan saw the construction of a third fortification ring known as Mura Spagnole, bastioned walls strategically positioned further from the medieval perimeter, incorporating new suburban development [4]. This shift in the positioning of the city walls marks the evolution of the military and urban planning of the period. During the culturally and technologically transformative era of the 18th and 19th centuries, Spanish bastions were adapted into a panoramic promenade [4]. The transformation of the promenade is also evident in publicly available historical maps from 1820, 1846, and 1885, which reflect changing urban planning tendencies [8-10]. Although the walls had outlived their defensive function by this period, the boundaries they created remained as administrative boundaries until 1873 [4]. The defensive structures were transformed into landscaped boulevards. The Spanish walls represent not only a layer of fortifications, but also a milestone in the urban palimpsest of the city. As part of the dismantling of the bastion walls, customs gates and triumphal arches were also built on the site of the original gates [4, 11]. Porta Sempione (27), on the axis from Castello Sforzesco, was remarkably transformed into a memorial arch known as Arco della Pace [12]. Among the altered gates, Porta Ticinese stands out – a monumental gate supported by Corinthian columns (25, in Figure 1, sketch in Figure 4).

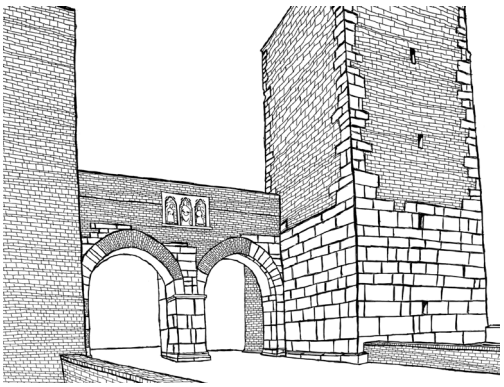

Fig. 2.: Sketch of Pusterla di Sant'Ambrogio (Source: author Jan Pytel)

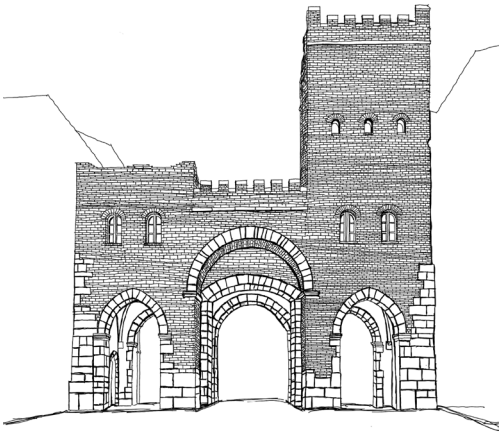

Fig. 3.: Sketch of medieval Porta Ticinese (Source: author Jan Pytel)

Fig. 4.: Sketch of 19th-century Porta Ticinese (Source: author Jan Pytel)

Contemporary Approach as a Current Tendency in the Area of Former City Fortifications

A typical approach to the design and use of the space of former city walls is the creation of new city rings. This approach can be observed in several Czech and European cities. After the walls were dismantled, relatively large vacant areas remained, offering numerous possibilities for use. For example, transport hubs, park rings, or ring roads could be created, in which new building typologies and existing typologies, which were revisited in the 19th century due to national re-

vivalist tendencies, could be applied. This period thus marked a flourishing of cultural buildings – philharmonic halls and theaters – as well as memory institutions such as museums and libraries. New institutions of state and government were also being built. In this regard, Czech cities such as Brno, Opava, and Krnov stand out. Among European cities, there is Vienna, and similar tendencies can also be seen in Milan.

For example, the city of Brno retained its fortifications until the mid-19th century. After the demolition of the walls, architect Förster submitted a proposal for the regulation and expansion of the city, which included the creation of tangents around the historical center of the city. Other architects gradually followed suit with subsequent public building projects [1]. In Milan, two ring roads were in fact created over time. These rings take the form of park-landscaped boulevards.

As a positive example of the contemporary approach to construction in areas of former city walls in the context of Milan, we highlight the master plan for Porta Volta (29), which was once part of the Mura Spagnole. The current form of the gate connects the city with the cemetery and has provided a radial connection [13]. The urban regeneration plan for Porta Volta was designed in 2010 by the architectural studio Herzog & de Meuron. Since then, Porta Volta has become a cultural center, implementing new functions and many green areas (Figure 5). The building follows the contour of the Porta Volta gate and preserves the footprint of the original bastions. The gate serves as a reference point within the city, complementing the two preserved original customs gates, Caselli Daziari di Porta Volta. In its simplicity and grand scale, the design is reminiscent of historic Milanese architecture, such as the Rotonda della Besana and Castello Sforzesco. The proposed buildings were also inspired by the elongated linear buildings of traditional rural architecture in Lombardy. The architects from studio Herzog & de Meuron subsequently created an elongated and narrow structure that embodies the geometric contours of the site and balances between transparency and the definition of space [11].

Fig. 5.: Photograph of Porta Volta Feltrinelli Publishing by Herzog & de Meuron (Source: author of the photograph Lenka Volná)

Another transformation of the city's bastion ring is, for example, the City Gate project, which completely reshaped the main entrance to Malta's capital, Valletta (studio Renzo Piano Building Workshop). This project is composed of four parts – Valletta's city gate and surrounding public space, the design of an open-air theater on the site of the former Royal Opera House, the construction of a new parliament building, and the landscaping of the moat [14].

The City Walls and Their Relationship to the Christian Sacral Buildings of Milan

An interesting phenomenon occurs in Milan, namely that some important early Christian churches are located near the city walls, which gives the impression of a certain sacredness intended to protect the city within the walls. The relationship between religious complexes and fortifications is documented in professional literature. It is described, for example, in the book Opavské hradby (The City Walls of Opava), and the following excerpt illustrates this connection [15]:

"Since the 19th century, the idea that monastery complexes adjacent to city walls played an important role in strengthening selected medieval city fortifications has become firmly established in professional literature and, under its influence, in general understanding. In fact, many of the city monasteries, especially those of the two most numerous mendicant orders, the Dominicans and the Minorites, were deliberately located on the periphery of the city district in contact with the line of walls precisely to reinforce this protective zone."

In Czech professional literature, the widely accepted idea is that sacred buildings significantly contributed to the defense of cities, whether due to their deliberately chosen strategic location within the urban layout, their integration into the fortification belt, or through special defensive arrangements [16].

Although the literature supports this idea, it is not the only reason or explanation for the location of Christian sacral buildings near city walls. For clarity, these churches and monasteries can be divided into two categories – inside and outside the city walls (intro and extra muros). Churches and monasteries built outside the walls were often surrounded by cemeteries, as burials within the walls were not permitted [17]. Some sacred areas were also surrounded by walls, which also served the symbolic function of separating the sacred from the profane (e.g., the Vatican). Another reason for locating churches along the walls was to allow for prayer before traveling or at the entrance to the city. Monasteries located extra muros were the heart of later suburbs and had an agricultural purpose [18].

In Milan, notable examples of the intertwining of sacral architecture and fortifications include the Basilica di Sant'Ambrogio (Figure 6, A) and the Basilica di San Lorenzo Maggiore (Figure 7, B). The location of the San Lorenzo complex outside the original city walls indicates its use for funerary purposes, which is related to the prohibition of burials within the city walls [17]. Both ancient basilicas were originally built extra muros. The original name of the Basilica di Sant'Ambrogio, Basilica Martyrum, directly refers to the burial of Christian martyrs persecuted during the Roman era. Another notable church is Santa Maria delle Grazie (Figure 8, C), home to Da Vinci's Last Supper, which was built as part of a Dominican monastery in an extra muros position [19]. Archaeological finds in the Piazza del Duomo area have shown that there was already an episcopal church here in Roman times. This early Christian Basilica in the intra muros position was located on the site of today's Piazza del Duomo.

Fig. 6.: Photograph of Basilica di Sant'Ambrogio – Early Christian atrium basilica from the 4th century AD, now in its Romanesque form (Source: author of the photograph Lenka Volná)

Fig. 7.: Photograph of Basilica San Lorenzo Maggiore – Early Christian church from the 4th century AD, with a Baroque façade and form (Source: author of the photograph Lenka Volná)

Fig. 8.: Photograph of Chiesa di Santa Maria delle Grazie (Source: author of the photograph Lenka Volná)

CONCLUSIONS

The paper studied the stratification of Milan in the context of city walls and their influence on the current urban structure, architectural identity, and symbolic values. By analyzing the development of gradually constructed wall circuits (chronologically Roman, medieval, and bastion) and their transformation into boulevards and important landmarks, we demonstrate that fortifications are not mere remnants, but that they played a key role in the development and shaping of the urban form of the city and its memory. The complexity and stratification of Milan are supported by its urban form. We are still capable of finding traces of fortifications in the street network of today's Milan.

Our field research and literary research support the statement that the radial growth of the city was derived from the original Roman castrum. Based on our research, it can be stated that the original layout of Milan influenced its current urban network. We would like to emphasize the relationship between sacral architecture and fortifications. Their connection is both spatial and symbolic. The paper addresses the reasons for the placement of Christian sacral buildings in the vicinity of the walls (whether intra or extra muros). The most remarkable motif appears to be the spiritual protective value that sacral buildings in the proximity of the walls could bring.

The contemporary approach to the sites of former city walls is represented by the Porta Volta master plan designed by architects Herzog & de Meuron. The project reflects the urban and spatial memory of the place, with the elongated building designed to trace the footprint of the bastion of the Spanish walls, following the Porta Volta customs gate. This urban-architectural intervention in the context of the city walls brings practical value to the city of Milan in the form of an interpretation of the geometry of the site and demonstrates a way to preserve the genius loci while offering new layers in the locations of the former city walls.

A key outcome of this research is a focus on an urban and architectural approach that incorporates geographical, historical, and morphological context in the design of former city fortification sites. Milan represents a compelling example of integrating contemporary structures into the historical layers of significant heritage areas. By exploring and documenting these urban traces and patterns, architects and urban planners can design sustainably in historic locations and respect history while moving forward.

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