

BASIC IDENTIFICATION**Site name:**

Cathedral of Santa Maria Matricolare (Verona Cathedral)

Location:

Verona (Veneto, Italy), Piazza Duomo

Associated complex:

Episcopal complex of Verona (cathedral, canons' buildings, cloister, Baptistry of San Giovanni in Fonte)

Geographical context:

Northern sector of the historic city of Verona, close to the Adige river, within a long-established ecclesiastical area characterised by continuity of cult and construction from Late Antiquity onwards

Chronological range (site):

Late Antiquity – present

Focus period for roofing systems:

Late medieval period (15th century), with earlier Romanesque survivals



Figure 1. Verona, aerial view of the Cathedral. (Source: [Wikimedia Commons](#))

1. HISTORICAL OVERVIEW

The Cathedral of Santa Maria Matricolare constitutes one of the most complex and stratified architectural monuments of medieval northern Italy. Its present appearance is the result of a long sequence of transformations, spanning from the Romanesque reconstruction of the 12th century to the extensive late Gothic remodelling carried out between the mid-15th and early 16th centuries. Rather than replacing earlier structures, these interventions progressively reconfigured the existing fabric, producing a building in which structural continuity and architectural renewal coexist in a highly articulate manner.

Within this long constructional history, the roofing systems play a central interpretative role. The cathedral preserves clear evidence of its original Romanesque timber roofs and lantern system, later radically transformed through the introduction of ribbed stone vaults and a new, highly sophisticated timber roof structure. The resulting configuration offers a unique opportunity to study the interaction between masonry vaulting and timber carpentry within a single monumental building.

The cathedral thus represents a key case study for the CaMeRoofs project, exemplifying a hybrid roofing strategy that mediates between the timber-dominated traditions of the Veneto and the late Gothic preference for vaulted interiors.



Figure 2. Verona, Cathedral, exterior view. (Source: A. Passuello)

2. BUILDING PHASES AND CHRONOLOGY

2.1 The Romanesque Cathedral (1120–1139)

The Romanesque reconstruction of Verona Cathedral, completed in 1139, established an architectural configuration strongly articulated in elevation. The building was organised as a three-aisled basilica with a pronounced differentiation between the heights of the lateral aisles, the central nave, and the presbytery.

The lateral aisles were covered by lean-to timber roofs with a gutter line at approximately 9.8 metres. These roofs abutted the central nave walls, which rose to a height of about 15.8 metres. The nave itself was originally covered by a timber roof supported by transverse arches.

The most distinctive feature of the Romanesque phase was the lantern tower erected above the fifth bay, at the junction between nave and presbytery. This structure, reaching a height of over 27 metres, was flanked by a pseudo-transept articulated solely in elevation, with additional volumes rising above the fifth bays of the side aisles.

Extensive evidence of this configuration survives in the attic spaces: decorative cornices, blind arcades, dentilled friezes, and the remains of mono- and biforate windows, many of which were later walled up. These elements allow a remarkably precise reconstruction of the original roofing and elevation system.

Structurally, the Romanesque roofing relied on timber carpentry combined with carefully calibrated masonry supports. The lantern, in particular, required an advanced understanding of load transfer and thrust management, achieved through polygonal buttresses and a sophisticated arrangement of wall masses.

2.2 The Late Gothic Reconstruction (1444–1513)

A decisive transformation of the cathedral began in 1444, marking the start of a prolonged late Gothic rebuilding campaign. Rather than demolishing the Romanesque church, the project aimed at raising and unifying the internal space by introducing stone vaulting throughout the building.

The intervention began in the eastern sector. Three ribbed cross vaults were constructed above the presbytery and the fifth bays of the side aisles, directly over the Romanesque lantern. Significantly, two of the original Romanesque arches of the lantern were preserved and incorporated into the new Gothic structure, demonstrating a conscious strategy of structural continuity.

Between 1447 and 1498, the rebuilding progressed westwards along the lateral aisles. The Romanesque columns were dismantled and replaced with composite piers featuring Corinthian capitals with triple orders of wind-blown leaves. The perimeter walls were raised

by approximately nine metres, lateral chapels and buttresses were constructed, and ribbed cross vaults were imposed over each bay.

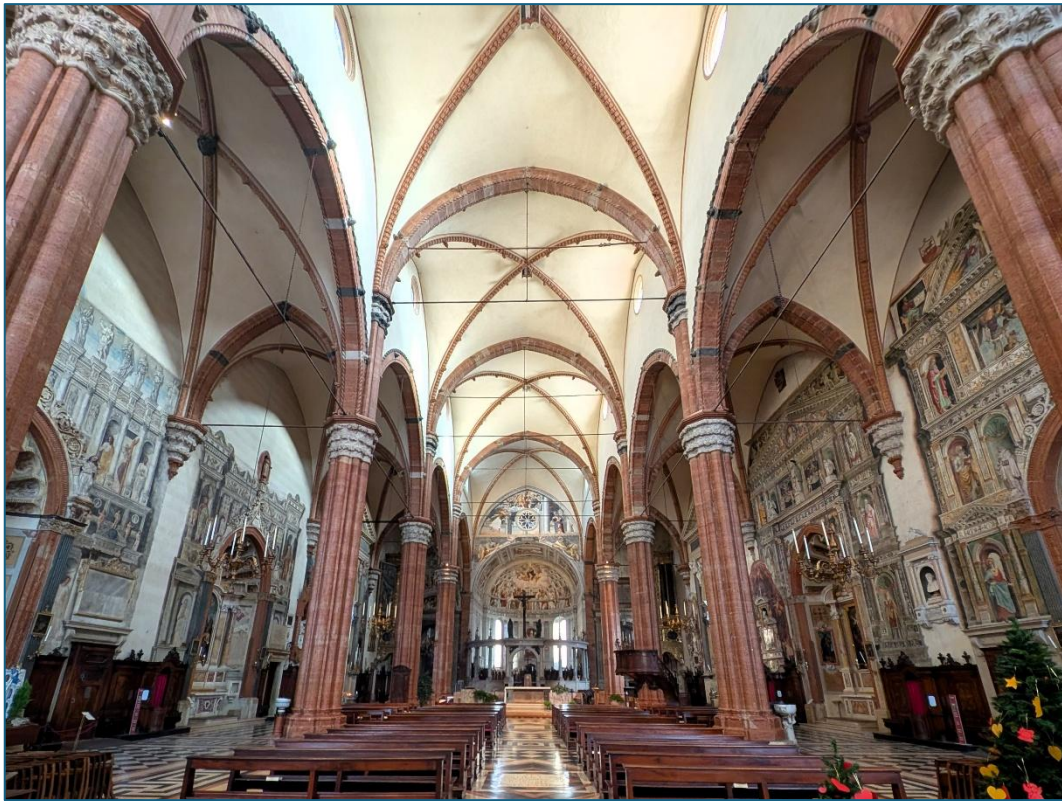


Figure 3. Verona, Cathedral, interior view. (Source: A. Passuello)

The final phase, between 1503 and 1513, involved the complete transformation of the central nave. The clerestory walls were elevated to match the height of the former lantern, the Romanesque biforate windows were replaced by large circular oculi, and four monumental ribbed vaults were constructed, creating the unified interior space visible today.

3. STRUCTURAL AND TYPOLOGICAL ANALYSIS OF THE ROOFING SYSTEMS

3.1 From Timber Roofs to Stone Vaults

The late Gothic remodelling fundamentally altered the cathedral's roofing strategy. The original Romanesque timber roofs were progressively replaced by masonry ribbed vaults, which became the primary interior covering system. This shift entailed a substantial increase in structural loads and required major modifications to the supporting system.

The introduction of vaults imposed vertical loads and lateral thrusts that were managed through the enlargement of piers, the construction of buttresses, and the thickening of perimeter walls. The transformation illustrates the technical challenges inherent in converting a timber-roofed basilica into a fully vaulted one.



Figure 4. Verona, Cathedral, quadripartite rib vaults. (Source: A. Passuello)

3.2 The Ribbed Vaults

The ribbed cross vaults of the nave and aisles represent a mature late Gothic solution. The ribs concentrate loads along defined trajectories, while the infill webs reduce overall mass. The geometry of the vaults ensures an efficient distribution of forces towards the supports, allowing the cathedral to achieve considerable height without compromising stability.

The vaults over the nave, in particular, play a crucial role in unifying the interior space, eliminating the earlier Romanesque hierarchy of elevations and creating a continuous spatial envelope.

3.3 The Timber Roof Structure above the Vaults

Above the stone vaults lies a highly elaborate timber roof structure, consisting of twenty-seven trusses with a span of over 12 metres and an interaxial distance of approximately two metres. Each truss comprises a principal tie beam, counter-tie, lower and upper rafters, lateral struts, and a central king post, connected through sophisticated carpentry joints and reinforced with metal fittings.

Scientific analyses have produced a striking result: numerous timber elements date back to the 11th–12th centuries, while others belong to later replacement phases, mainly from the 18th and 19th centuries. No timber has been conclusively dated to the 15th or early 16th century, strongly suggesting the extensive reuse of Romanesque material within the late Gothic roof.

This evidence reveals a practice of material continuity and recycling, whereby structurally sound elements from earlier roofs were deliberately retained and reassembled within a new structural logic.

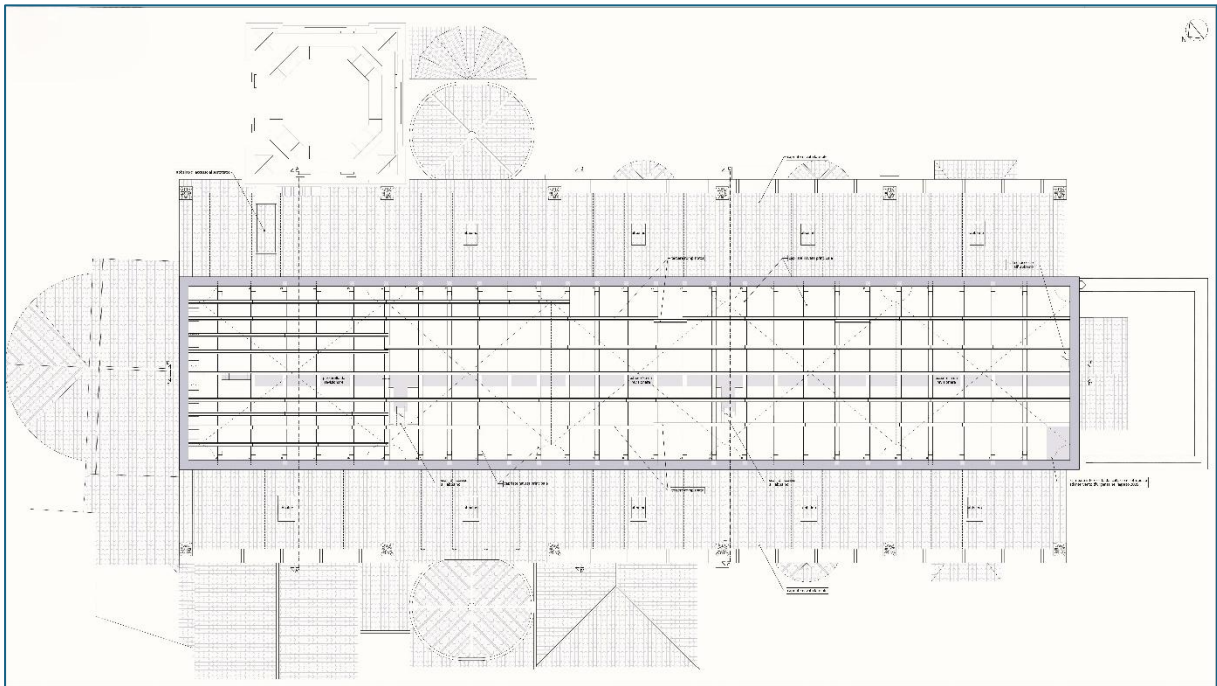


Figure 5. Verona, Cathedral, attic plan with indication of timber trusses. (Source: Arkitet Studio, Verona)

4. CONTEXTUALIZATION OF THE ROOFING SYSTEMS

4.1 Verona Cathedral within Northern Italian Gothic Architecture

The late Gothic transformation of Verona Cathedral places the building within the broader context of northern Italian ecclesiastical architecture, particularly the large-scale cathedral projects of the 15th century.

The composite piers show close affinities with those of Milan Cathedral, while the overall spatial conception finds a convincing parallel in San Petronio in Bologna, especially in the articulation of supports and the treatment of the clerestory with circular openings.

4.2 Venetian and Mendicant Influences

At the same time, the cathedral's broad and unified interior recalls the great mendicant churches of Venice, such as Santa Maria Gloriosa dei Frari and Santi Giovanni e Paolo, suggesting a dialogue between Lombard structural traditions and Venetian spatial models.

The cathedral thus occupies a mediating position between different architectural cultures, reflecting Verona's role as a crossroads between the Po Valley and the Veneto.

4.3 Hybrid Roofing Strategies

In contrast to Santa Anastasia, which relies exclusively on stone vaulting, and to San Fermo and San Zeno, which privilege timber ceilings, Verona Cathedral exemplifies a hybrid roofing strategy, combining masonry vaults with an advanced timber superstructure. This synthesis underscores the adaptability of medieval builders and the absence of rigid typological boundaries.

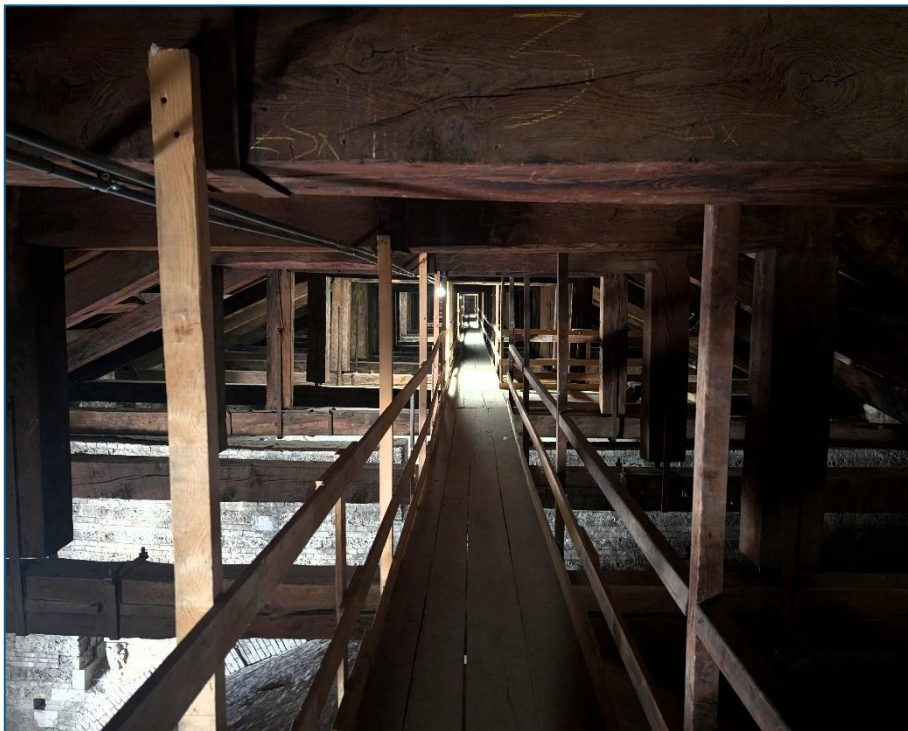


Figure 6. Verona, Cathedral, detail of the attic spaces above the central nave. (Source: A. Passuello)

5. RESTORATION HISTORY AND CONSERVATION STATUS

From the 19th century onwards, the cathedral's roofing systems have been the subject of numerous restoration campaigns. Major interventions occurred in 1959, between 1983 and

1989, and again between 2013 and 2015. These works addressed structural decay, biological degradation of timber elements, and the need to improve load distribution.

Restoration strategies included the consolidation of weakened truss ends, the insertion of timber prostheses, metal reinforcement plates, and the replacement of secondary roof elements. Throughout these interventions, considerable care was taken to preserve the historic configuration of the roof and to respect the coexistence of elements from different periods.

Today, the roofing systems of Verona Cathedral are in a stable condition and remain fully functional, offering an exceptional case study in the long-term performance and adaptability of medieval roof structures.

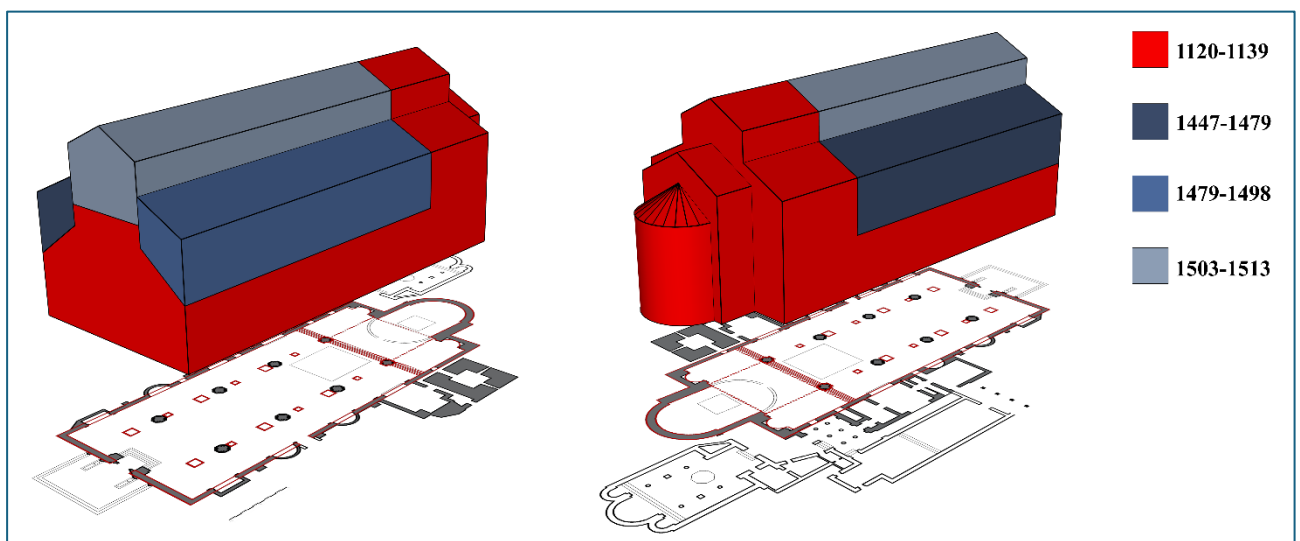


Figure 7. Verona, Cathedral, 3D model illustrating the evolution of roof systems from the 12th to the 16th century. (Source: A. Passuello)

6. ESSENTIAL/SELECTED BIBLIOGRAPHY

- Agostini, M. (2006). *Sum Pelegrinus ego qui talia sic bene sculpo*: il magister Pelegrinus e la Cattedrale di Verona. In *La Cattedrale di Verona tra storia e arte* (pp. 55–95). Verona.
- Agostini, M. (2006). Un inno umanistico all'Adamo: l'interno della Cattedrale. In *La Cattedrale di Verona tra storia e arte* (pp. 97–119). Verona.
- Bartoli, A. (1987). Il complesso romanico. In P. Brugnoli (Ed.), *La Cattedrale di Verona nelle sue vicende edilizie dal secolo IV al secolo XVI* (pp. 99–165). Venezia.
- Brugnoli, P. (1987). La rifabbrica quattrocentesca. In P. Brugnoli (Ed.), *La Cattedrale di Verona nelle sue vicende edilizie* (pp. 169–245). Venezia.
- Coden, F. (2010). “Terremotus maximus fuit”: il sisma del 1117 e l'architettura medievale dell'area veronese. *Arte Veneta*, 67, 7–24.

- Coden, F. (2021). Osservazioni sulla cattedrale medievale di Verona. In A. M. D'Achille et al. (Eds.), *Domus sapienter staurata* (pp. 337–347). Cinisello Balsamo.
- Guzzo, E. M. (1993). *La Cattedrale di Verona*. Verona.
- Trevisan, G. (2016). L'architecture religieuse en Vénétie aux XIe et XIIe siècles. État des questions. *Bulletin Monumental*, 174(1), 89–104.
- Valenzano, G. (2007). La cattedrale di Verona nel contesto dell'architettura veronese tra XI e XII secolo. In A. C. Quintavalle (Ed.), *Medioevo. L'Europa delle cattedrali* (pp. 260–267). Milano.
- Valenzano, G. (2008). Il duomo di Verona. In F. Zuliani (Ed.), *Veneto Romanico* (pp. 147–157). Milano.
- Valenzano, G. (2009). L'architettura ecclesiastica tra XI e XII secolo. In J. Schulz (Ed.), *Storia dell'architettura nel Veneto* (pp. 90–193). Venezia.