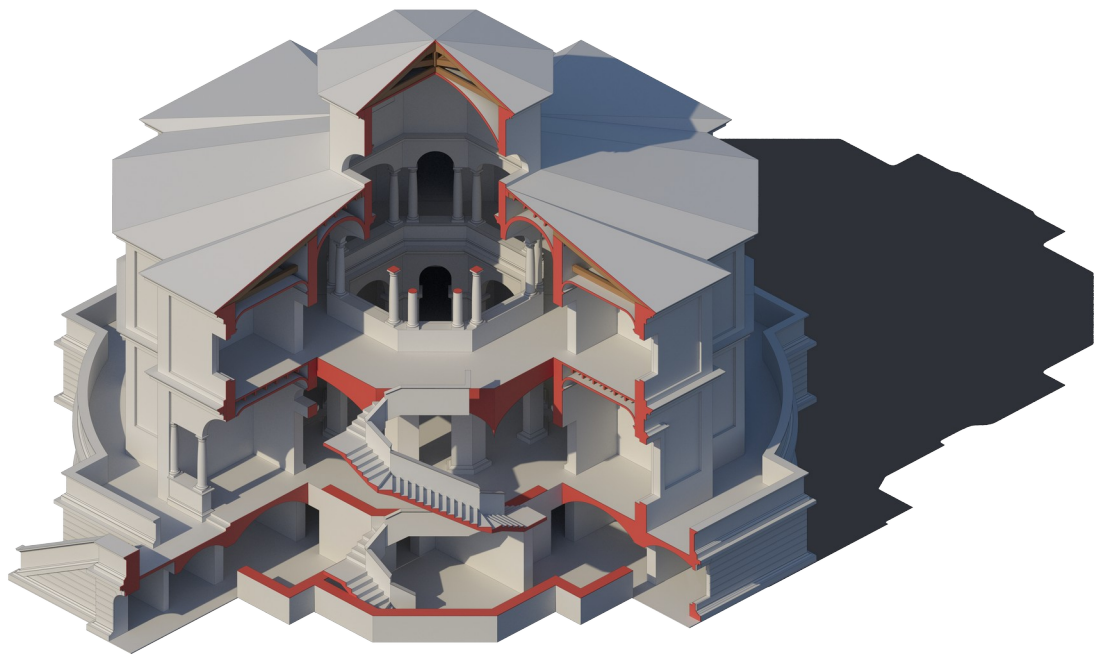


Isolated_Palace_for_a_Noblemen_by_Mauro_Guidi



Description

"Isolated Palace for a Nobleman" is an utopian project by Mauro Guidi, a visionary architect from Cesena who lived between 1761-1829. His thought starts from the idea of a destroyed town that could be reconstructed entirely following an eclectic style. All his architectural and urbanistic drawings are contained into 11 atlases, articulated according to different scales and typologies of project. Specifically, the building taken into consideration is included into Paper 193 of Atlas 42.

The reconstruction is developed starting from the articulation of a determined uncertainty scale of the sources. It divides all the elements composing the architecture into groups based on the level of accuracy of the informations used for the reconstruction. The highest level of accuracy is given by the original drawing of Mauro Guidi, after there are references taken by different drawings of the same author and of different authors when the original paper is not clear or accurate. Then the same thing when the original paper doesn't give informations about the specific element. The lower level is linked to conjectures due to personal knowledge, not developed starting from sources. Into the calculation of the overall level of uncertainty, each element has been balanced in base of its volume dimension and the level to which it belongs. So big volume or high number of elements belonging to the same category give a greater contribution to the result. In the case of this reconstruction the result was 3.39.

To show and explain the entire process conduit have been used two different types of digital representation: the first one is a continuous mathematical method, on which is based the creation of the 3d model by the software Rhinoceros, while the second one is a discrete polygonal method, used for the graphic trasposition of the model into images. These one have been created by the software Autodesk 3D Studio Max and then organized into specific layouts by the photo editing software Adobe Photoshop. In this phase, final renders showing characterizing prospectives and geometrical drawings of the building have been overlying by 2d vector output to make more clear the

geometry of the constitutive elements. The whole process of reconstruction had the aim to analyze, to decompose and to represent complexity and articulation of an architectural project. The architectural drawing is meant as a graphic language aimed at the study, analysis and production of this one, from its conception to its execution.

Scientific Advisor

Igor Bajena, Jan Lutteroth

Modelling

Matilde Barchi, Sofia Capelli

Cooperation Partnership

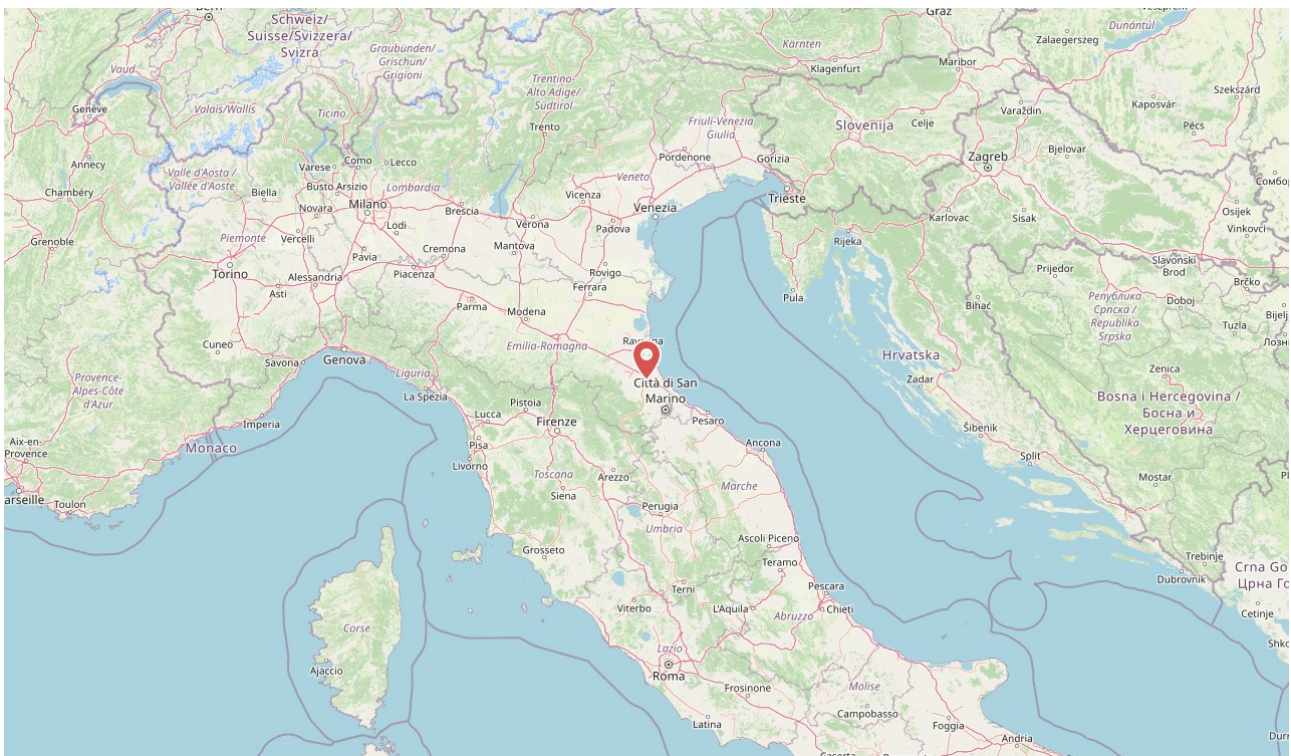
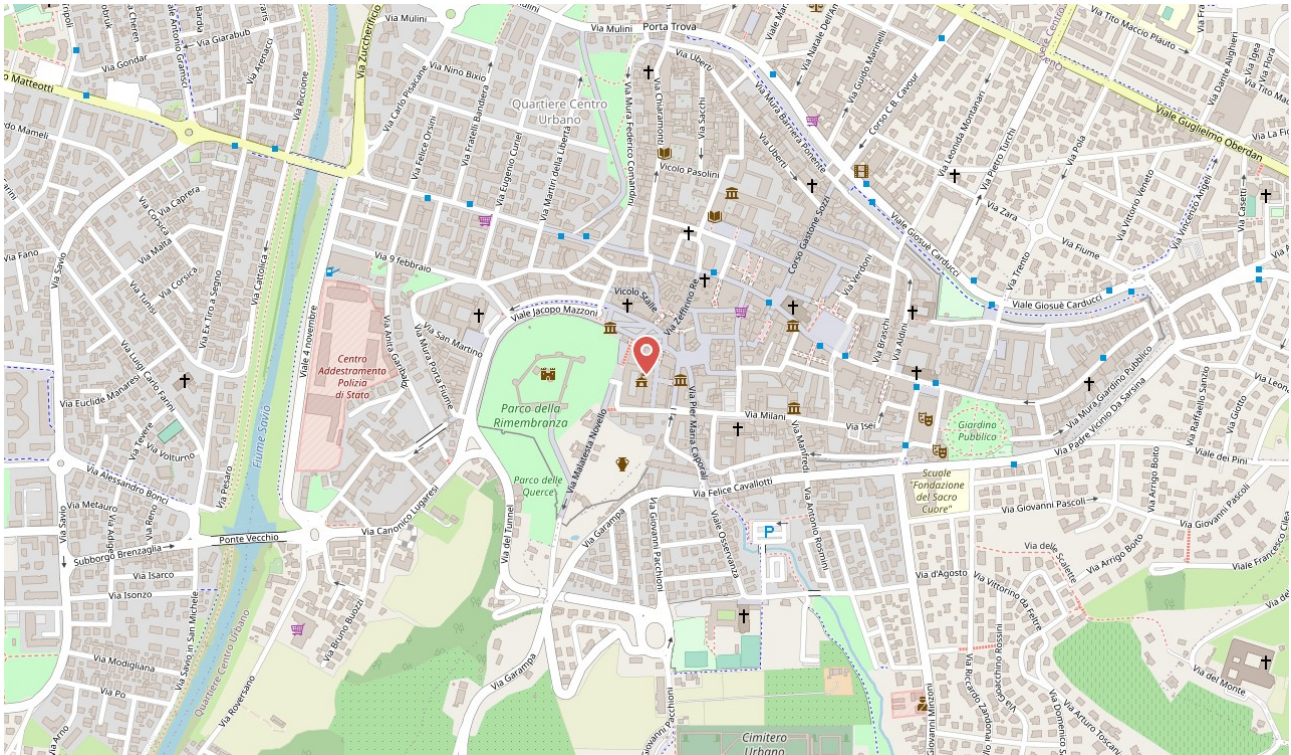
UNIBO - University of Bologna

Used Software

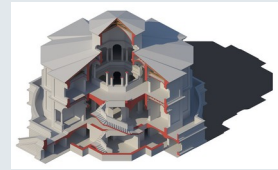
Rhinoceros 7, Autodesk 3D Studio Max, Adobe Photoshop

Geo-coordinates

Latitude 44.136352 Longitude 12.242244



General structure



Variant: around 1800 nach Barchi/Capelli

Working state

Paper 193 of Atlas 42 contains Guidi project for an "isolated palace for a nobleman". It's a three-story building, described through a section, an elevation and a plan drawings. The last one is split in two: the right side represents the first floor while the left one the second floor. The unit of measure of the project is Cesena's foot, an ancient local unit used by blacksmiths and farmers equal to 10 ounces, corresponding to 53.84 cm. Taken this measure as a primary module, the study of the source started with the individuation of multiples and submultiples of it. It allowed to give proportions to the building, as similar as possible to the original drawing, thanks to a method based on a scientific approach.

Reconstruction

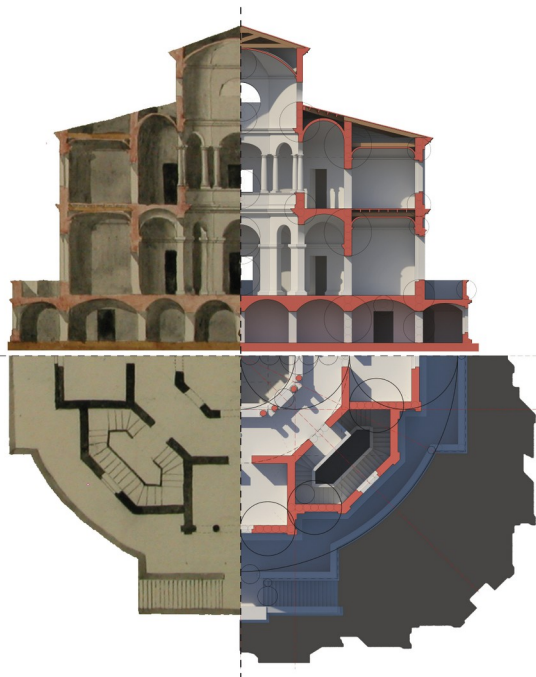


Fig. 18 Study of the modularity of plan and section

Sources

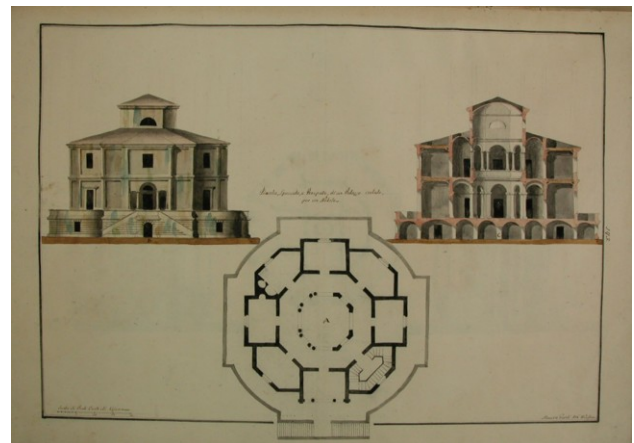
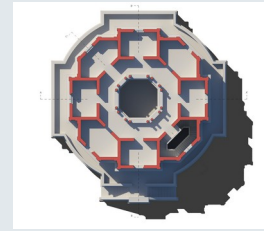


Fig. 1 Atlas 42 Paper 193



Fig. 25 Study of the modularity of elevation

General structure - First and second floor



Variant: around 1800 nach Barchi/Capelli

Working state

The building presents a central plan: an external circular perimeter, characterized by four rectangular ledges, encloses the main structure, formed by the intersection between an octagonal shape and a cross one. At the center the octagonal nucleus presents an ambulatory space bordered by alternate exagonal and rectangular rooms. The geometric drawing of the plan is scanned by four axis of symmetry, partitioning it in eight pieces. This feature has been used during the reconstruction process: indeed it was possible to analyse only one part of the building and then reiterate it following the principle of radial simmetry.

Fullness and emptiness follow rigid proportions based on the primary module. A space open to the outside acts as the main access to the internal distribution. Its function is emphasized by the presence of two columns and two semi-columns at the two sides of the access door. The first floor presents angular pillars at the edge of the nucleus, while the second floor is characterized by columns in the same position.

The first dimension fixed was the wall thickness: analysing other Guidi's projects, emerged that the diameter of the column shaft is frequently equal to the primary module. In this case, thickness of the walls and diameter of the shaft had the same size; for this reason both of them have been considered equal to one Cesena's foot and all the building proportions have been adapted to this.

Reconstruction

Sources

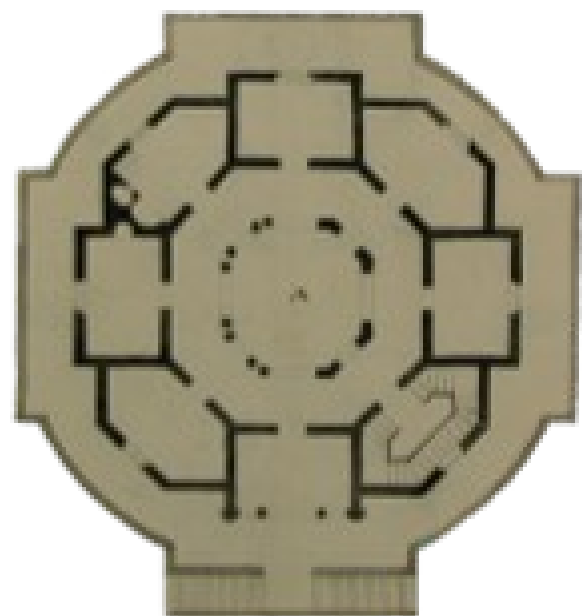
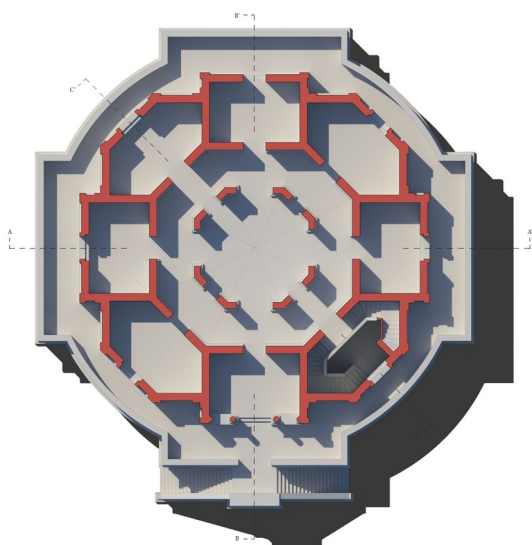


Fig. 19 First floor plan

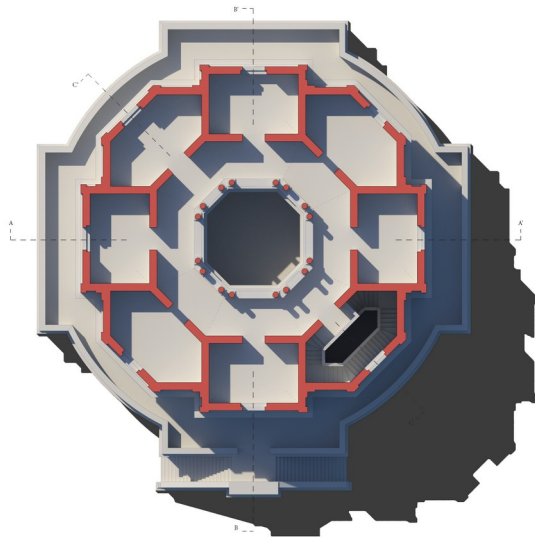
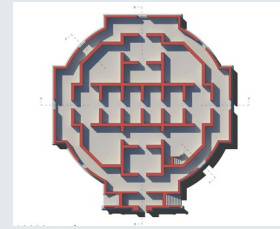


Fig. 9 Atlas 42 Paper 193 - plan

Fig. 20 Second floor plan

General structure - Ground floor



Variant: around 1800 nach Barchi/Capelli

Working state

There is no original drawing of the ground floor plan, so the reconstruction of this part of the building was led from analyses made on other coeval architectures. In different cases, the plan was formed by an ambulatory space that enclosed an internal structure formed by orthogonal vertical partitions. This scheme is repurposed in the case study, taking into account the structure of the upper floors and dividing the spaces created into smaller rooms by other orthogonal walls.

Reconstruction

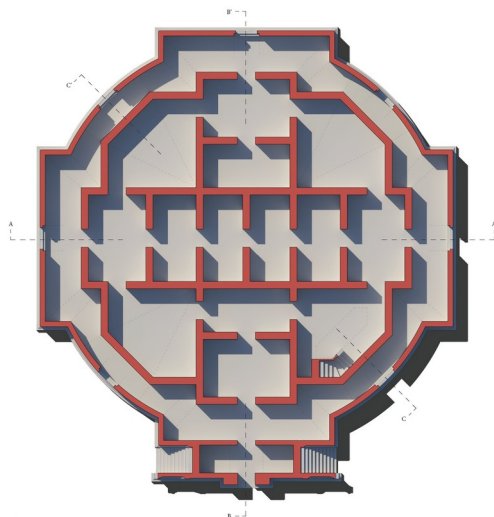


Fig. 15 Ground floor plan

Sources

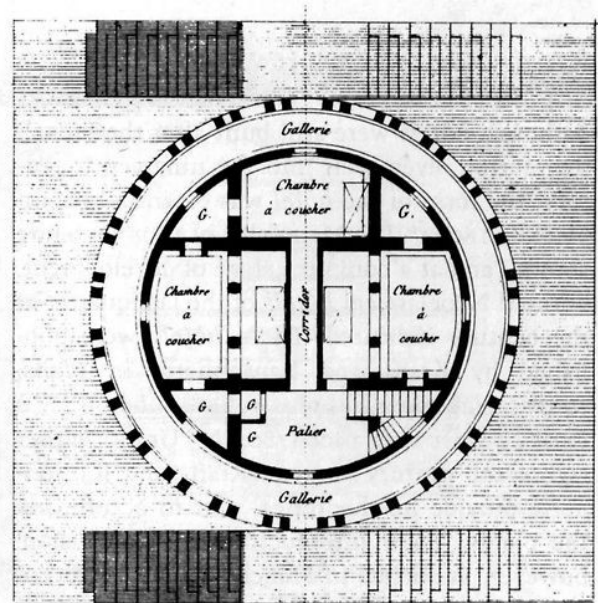


Fig. 17 Cylindrical country house

General structure - Floors structure



Variant: around 1800 nach Barchi/Capelli

Working state

The floor structure is reconstructed starting from the analyses of the original drawing of the section. In the representation of the first floor a traditional wooden frame can be noticed, made by beams and joists. To proportion the structural elements following the previous working logic, the thickness of the whole stratigraphic section is considered equal to one primary module. Then this measurement has been divided in submultiples to find the dimension of singular elements: the highness of the beams is half a module while their thickness is $\frac{1}{3}$ of module, equal to the highness of the joists; the thickness of these one is $\frac{1}{6}$ of the module like the thickness of the wooden slab.

Reconstruction



Fig. 32 Prospective section

Sources



Fig. 27 Atlas 42 Paper 193 - section

General structure - Floors structure - Vaults



Variant: around 1800 nach Barchi/Capelli

Working state

Some of the vaulted ceilings have been defined through an easy interpretation of original drawing of the section. In the not visible rooms, vaults have been modeled simply following the geometric shape of the walls or referring to some vault tipologies that were known and used during the Guidi's age. Starting from the ground floor, the models of vault identified are barrel vault for perimeter ambulatory space and quadrangular rooms and sail vault for pentagonal rooms. The first floor ceilings present sail vault above the central hallway, gaveta vault into quadrangular rooms (both visible on Guidi's drawing) and polygonal barrel vault in exagonal rooms. At the second floor barrel vaults cover up the hallway while the perimeter rooms have the same type of ceiling of the one on the floor below.

The study of the vault situated in the upper part of the roof has been particularly laborious because the original source represents only half part of the structure. The first hypothesis considered it as a wedge conformation, made up by eight regular parts. Then, thanks to a deeper analyses conduit on the front's drawing, it was concluded that the ceiling is created by the intersection between a barrel vault, developed lengthwise in one direction, and an umbrella vault.

Reconstruction

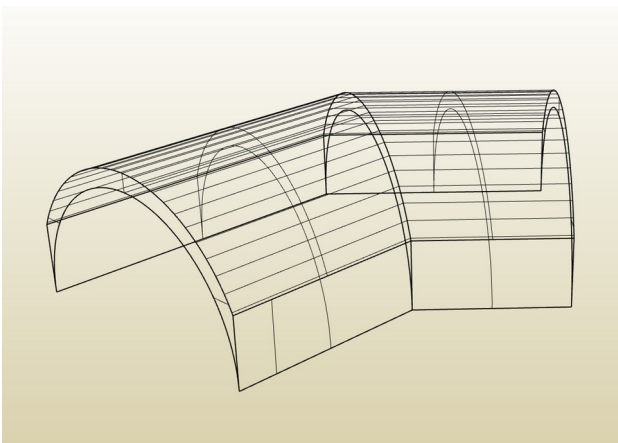


Fig. 36 Barrel vault over the hallway

Sources



Fig. 27 Atlas 42 Paper 193 - section

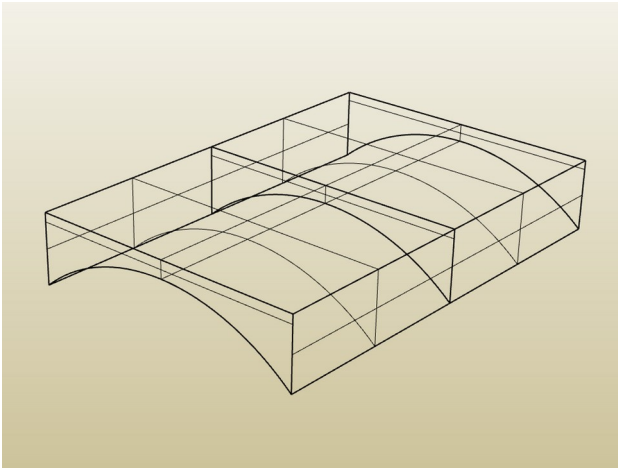


Fig. 38 Barrel vault over the quadrangular spaces

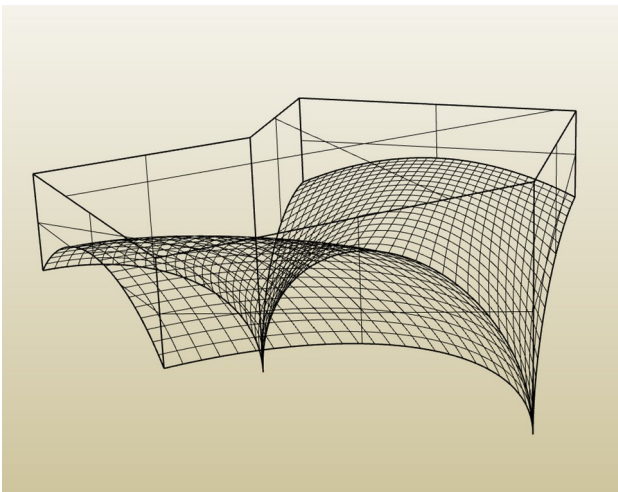


Fig. 40 Sail vault

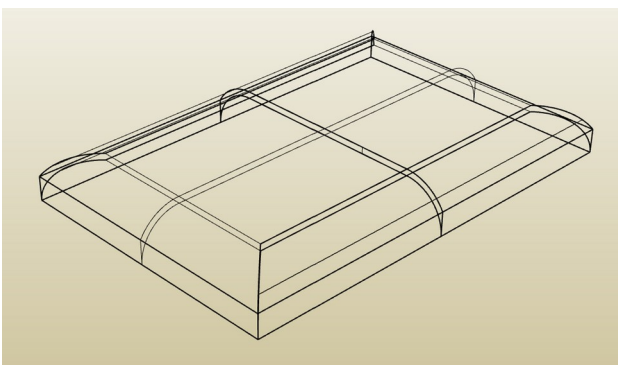


Fig. 39 Garetta vault



Fig. 26 Atlas 42 Paper 193 - elevation

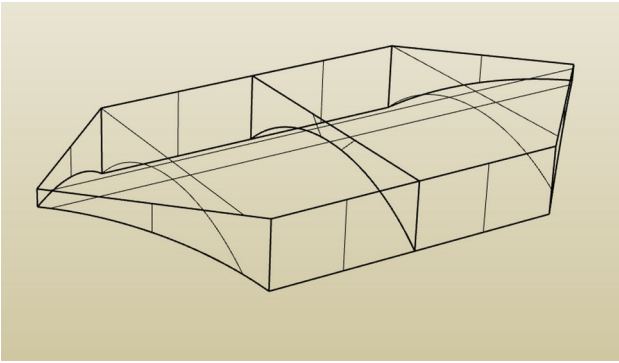


Fig. 35 Barrel vault over the exagonal spaces

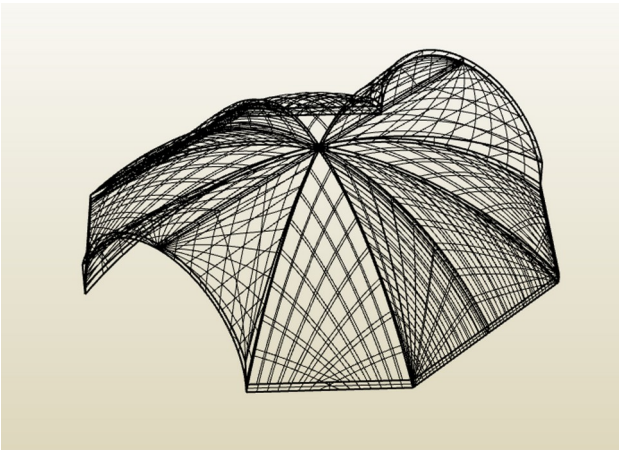


Fig. 37 Upper roof ceiling

General structure - Floors structure - Roof



Variant: around 1800 nach Barchi/Capelli

Working state

The roof shape and the direction of the roof pitches were easy to understand by the drawing of the section, while has been more difficult to define the structural part, because in the original source it is not represented. The thickness of the roof pitches has been taken as equal to the one of the wooden slab of the floors, that is $1/6$ of module. Then, taken the dimensions already used, beams and joists have been positioned, the first ones along the pitch direction. The central upper part was drawn by Guidi with a wooden structure as thin as it can't hold up the weight of the roof lining. So its thickness has been increased and in this way it was possible to add a new truss system, composed by two orthogonal elements. The study of the dimensions of the trusses has been led following as source the drawing made by Andrea Palladio on his work "I Quattro Libri dell'Architettura", from which has been taken the thickness of the various constitutive parts. This oversizing process compared to the original drawing of Guidi caused a downward shift of some building components such as vault, cornice and lunette windows. Consequentially, in this upper part the reconstructed front is shifted down from the Guidi's one.

Reconstruction

Sources



Fig. 27 Atlas 42 Paper 193 - section

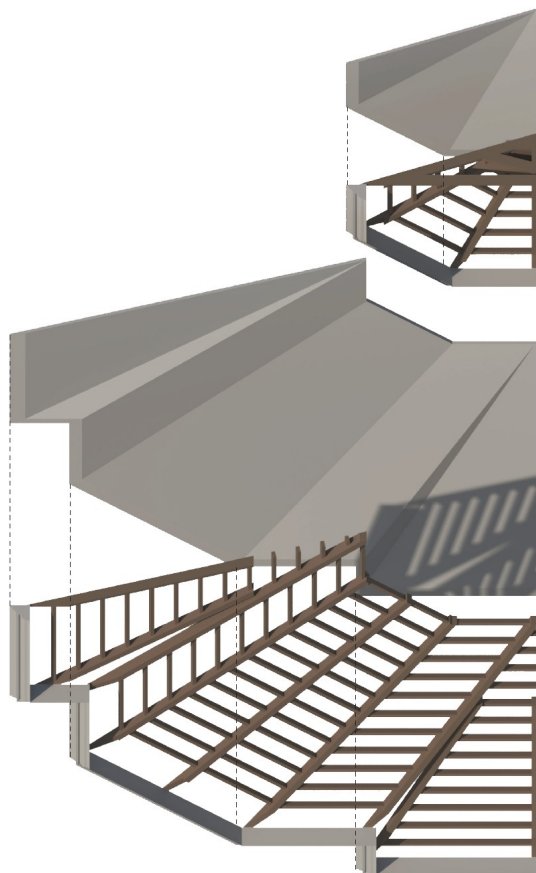


Fig. 43 Detail of the roof structure

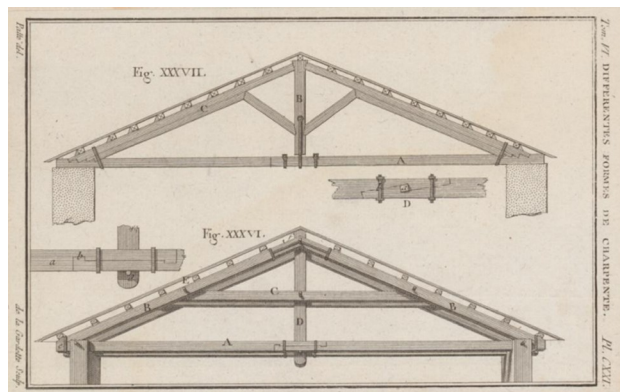


Fig. 3 | Quattro Libri dell'Architettura

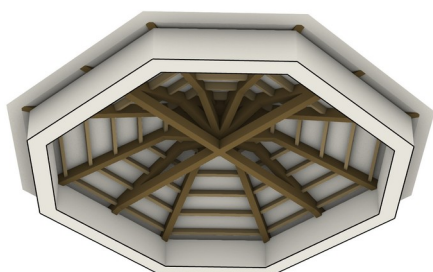
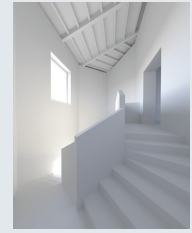


Fig. 44 Structure of the upper roof



Fig. 45 Comparison in elevation between source and reconstruction

Staircases



Variant: around 1800 nach Barchi/Capelli

Working state

Staircases are characterizing elements of the building. For their reconstruction the first important phase was to individuate the floor highness studying the original section. The module has been used as an instrument to scan the building also in elevation. The vertical connections between the floors are one double external staircase that links the ground floor to the main floor and an internal pincer staircase, articulated on all the three levels.

The first one defines the main access to the palace. It has a number of steps undefined by the source, indeed the two side are represented with a different number of steps, so it has been chosen to use a standard highness of the step for the reconstruction. The parapet is decorated by cornices and positioned over a structure presenting rustication as all the perimeter walls of the ground floor. At the center of the structure's elevation there is an arched door for the access to the ground floor, which leads to a rectangular room of entrance.

The internal staircase has been more difficult to interpret, because it is constituted by an approssimated number of steps, analysing the plan. The reconstruction is based on the maintenance of the original shape, sized with multiples of module, while the choosen of the highness and number of steps has been more arbitrary, adapted to the existing differences of level. The modeling of angular steps is interesting for their role of connections between ramps: their bottom surface is formed by hyperbolic paraboloids to give a better cohesion to the elements. The parapet appears as a succession of plain walls ornated on the top with cornices. These elements create a structure interrupted in the connection point between ramps because of perceptible changes of highness. The access to the staircase is possible thanks to two landings corresponding to the two upper floors.

Reconstruction

Sources



Fig. 27 Atlas 42 Paper 193 - section

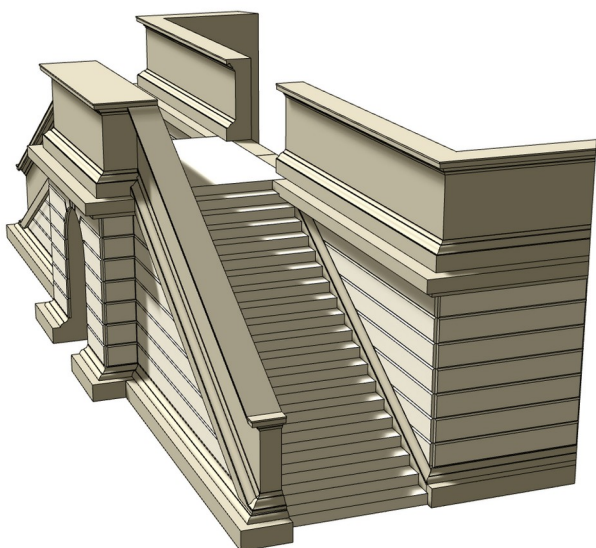


Fig. 26 Atlas 42 Paper 193 - elevation

Fig. 28 scale esterne.png

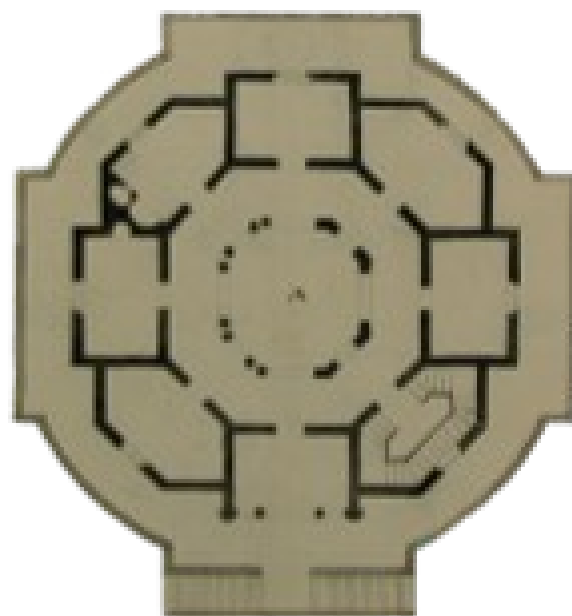
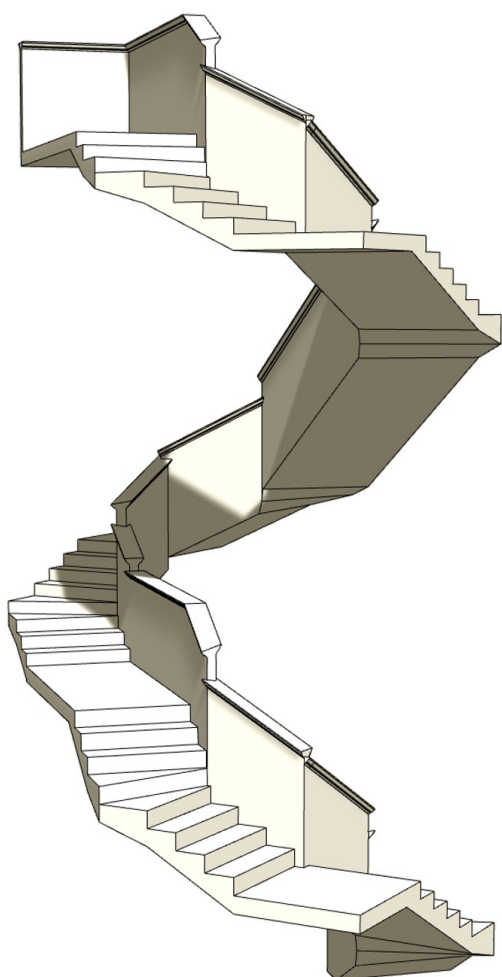


Fig. 9 Atlas 42 Paper 193 - plan

Fig. 29 scale interne.png

Tuscan Order



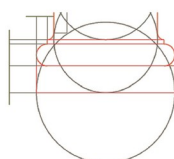
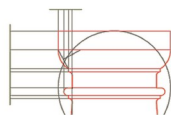
Variant: around 1800 nach Barchi/Capelli

Working state

The study of the architectural order is based on the reading of "I Quattro libri dell' Architettura" by Andrea Palladio. It contains written descriptions of all typologies of order, considered in its entirety and also decomposed in its constitutive parts. These descriptive texts are really detailed outlining dimensions and proportions of the elements.

The model taken into consideration is the Tuscan order, presents both inside and outside the building. The small size of elements of detail drawn by Guidi makes only visible the extreme simplicity of the decorations, but not in particular the shape of the single moldings. However, from this source can be studied the relationship between the highness and the basis diameter of the column: this information is the one from which it could be possible analysing the single elements proportion. These dimensions and the simplicity of shapes permitted to assign the case study to the type of the Tuscan order. The basis diameter has been considered equal to the primary module, then has been fixed the highness of the whole column and afterwards sizes and proportions generating basement, shaft and capital.

Reconstruction



Sources

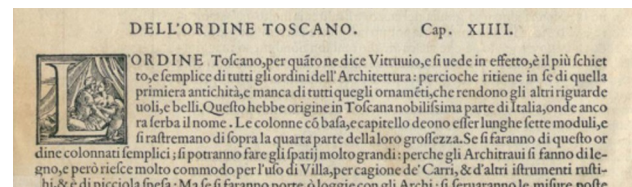


Fig. 5 I Quattro Libri dell'Architettura

Fig. 47 Tuscanic column

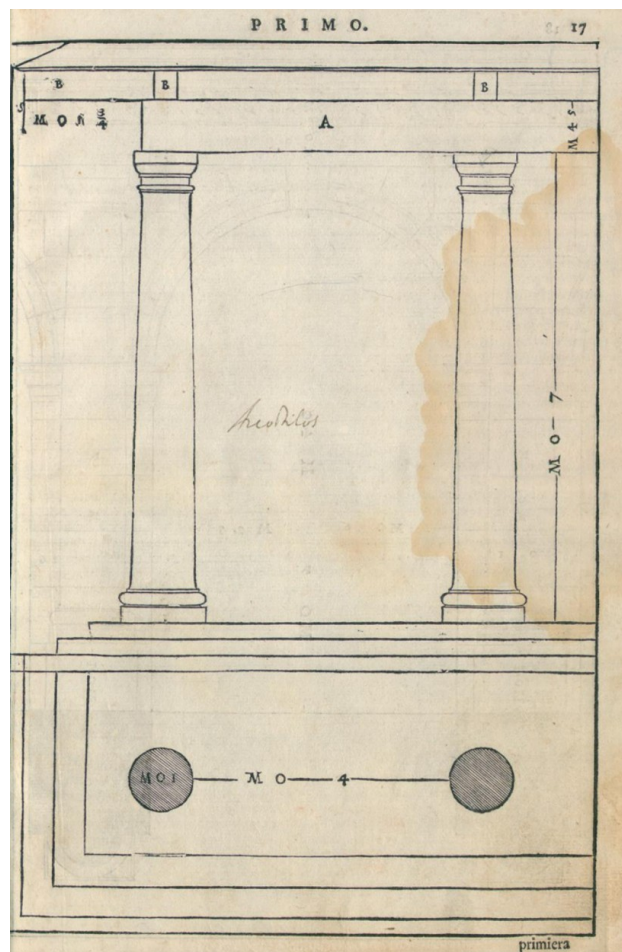


Fig. 6 I Quattro Libri dell'Architettura

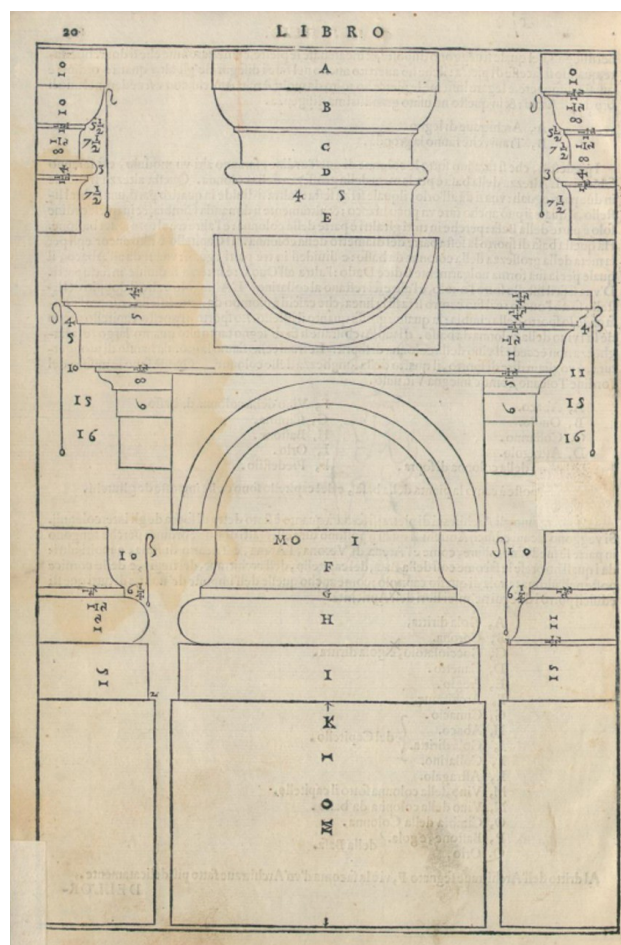


Fig. 2 | Quattro Libri dell'Architettura

Tuscan Order - Cornices

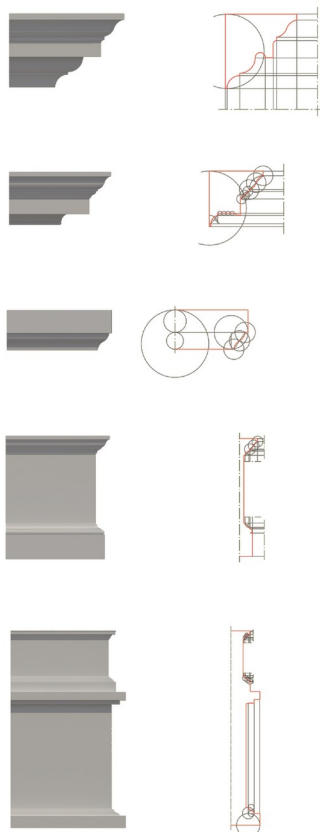


Variant: around 1800 nach Barchi/Capelli

Working state

Cornices constitute a relevant theme for their great quantity both inside and outside the building. In the first phase of categorization have been identified different typologies and has been analysed in which cases the author decided to use the same type of molding. The original source is not so clear to make possible the recognition of each decorative profile, but it provides useful informations to make a plausible interpretation. Studying the Palladio's treaty, have been singled out some models similar to the moldings used by Guidi, then they have been redesigned, scaled following the module and put into the building reconstruction. The models taken in analyses are mainly Tuscan and Doric order. Other cornices are less attributable to known types so have been use classical rules and proportions to model them with encumbrances and shapes similar to the original ones.

Reconstruction



Sources

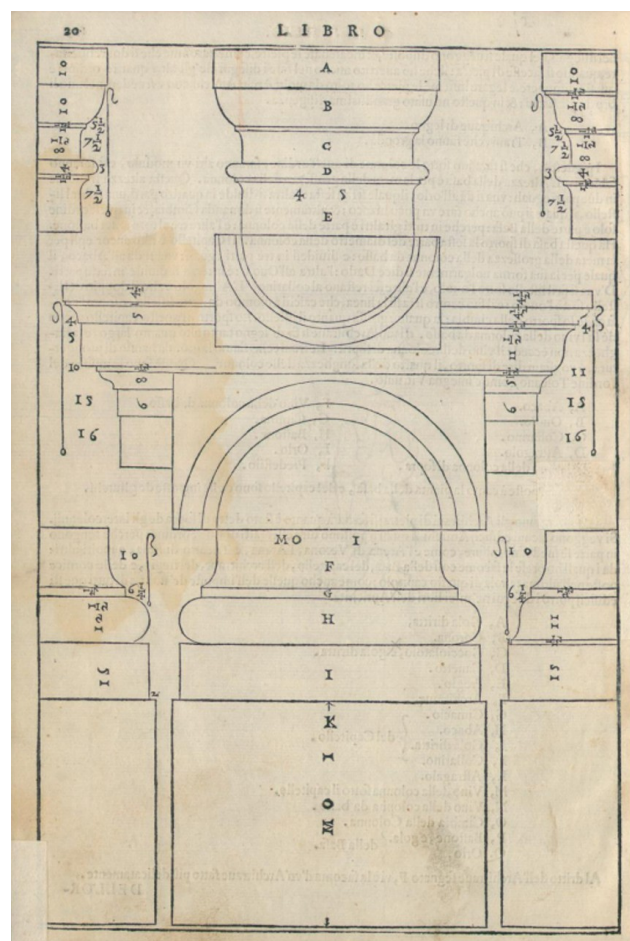


Fig. 48 Cornices

Fig. 2 | Quattro Libri dell'Architettura

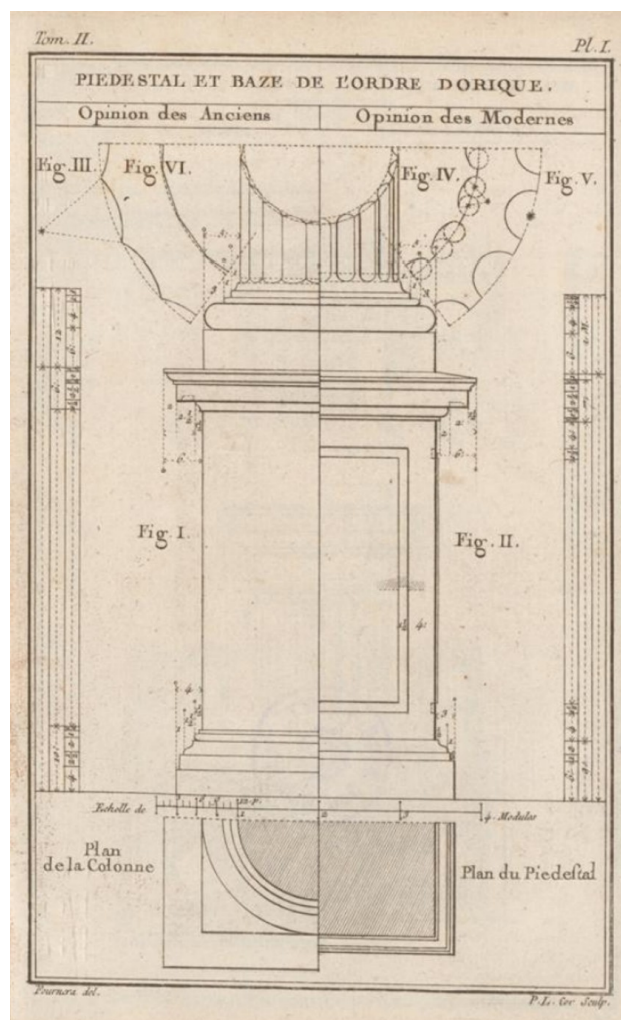


Fig. 4 | Quattro Libri dell'Architettura

Elevation



Variant: around 1800 nach Barchi/Capelli

Working state

Considering the theme of external openings, Guidi's elevation and section have been compared and this highlighted some incoherences between the two drawings. During the reconstruction process has been mostly modified the position of the second floor's windows and of the lunette windows on the upper part of the building because in the source it comes into conflict with some structural internal elements. On the ground floor the elevation drawing shows rectangular windows that seem to intersect the barrel vaults of the ceiling. However, analysing the section emerged that the internal side of the openings is wider and it follows the shape of the vault, not intersecting it. This drawing also represents openings on the first floor appearing as windows, but it doesn't show the ones on the main front. From the elevation is not recognizable if they are doors or windows, because of the presence of a solid parapet that hides their lowest part. So the openings on the main front and on the opposite one have been interpreted as doors, considering the longitudinal subdivision of the gap as two steps and not as a difference of levels between the windowsill and the floor. This decision is also linked to reasoning in terms of utility and formal harmony.

Reconstruction

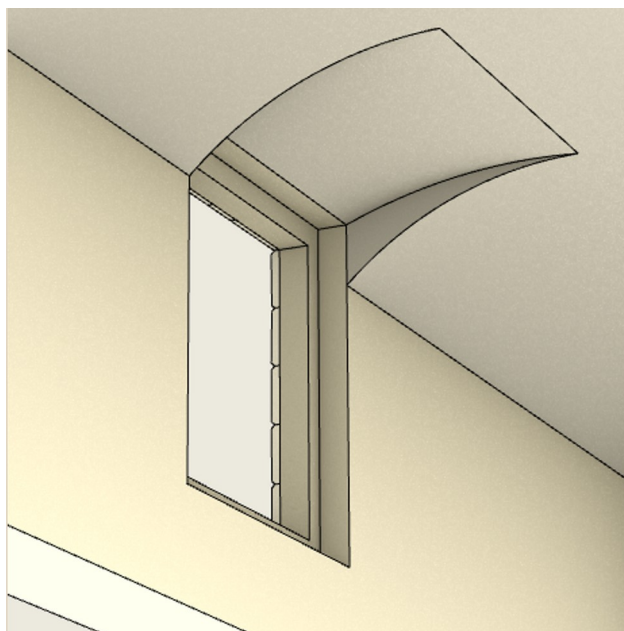


Fig. 50 Lunette rectangular window on the ground floor

Sources



Fig. 26 Atlas 42 Paper 193 - elevation



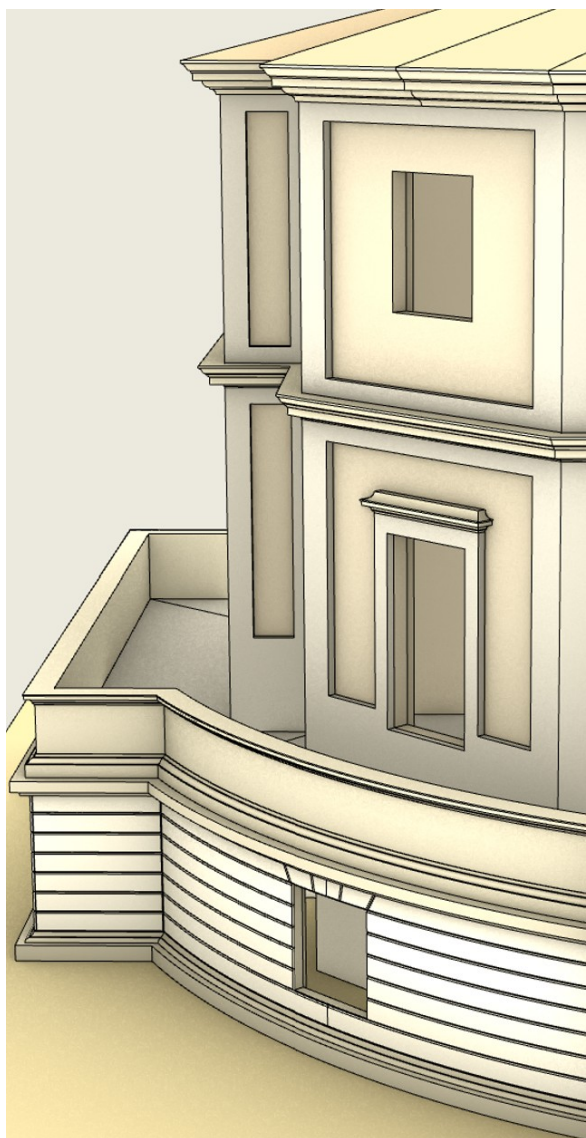


Fig. 27 Atlas 42 Paper 193 - section

Fig. 51 Reconstruction of the openings on the three floors



Fig. 53 Main front

Elevation - Main access



Variant: around 1800 nach Barchi/Capelli

Working state

The main entrance takes the shape from the serliana model, consisting of two semicolumns leaned against the wall and other two holding up the arch. Has been supposed that these four elements are placed over a basamental structure, interrupted in the central part where there is the door access. Two steps have been added, permitting to reach the height of the internal floor that results higher than the external balcony, examining the section. The reconstruction process of this basamental wall starts with the observation of original drawings by Sebastiano Serlio and the reposition of his model: its width is bigger than the one of Palladio's examples and are shown two level of cornices, one in the bottom and one in the top of the element.

Reconstruction

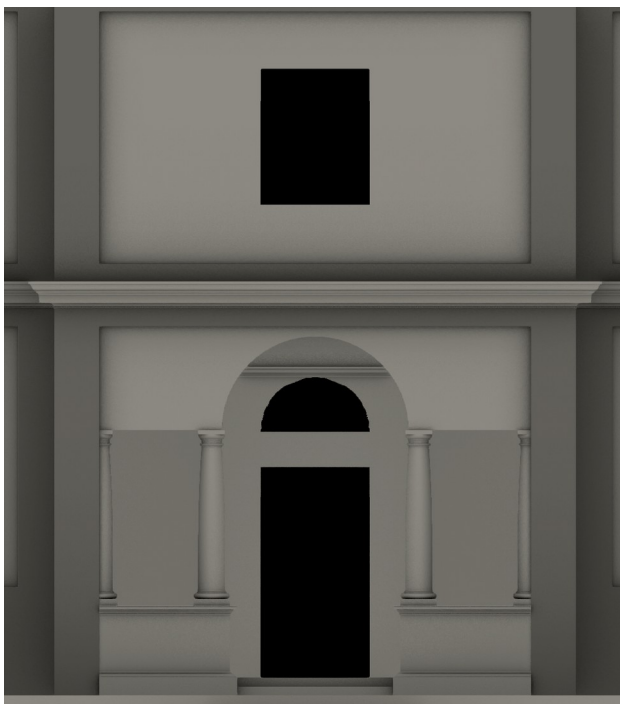


Fig. 55 Detail of the entrance reconstruction

Sources

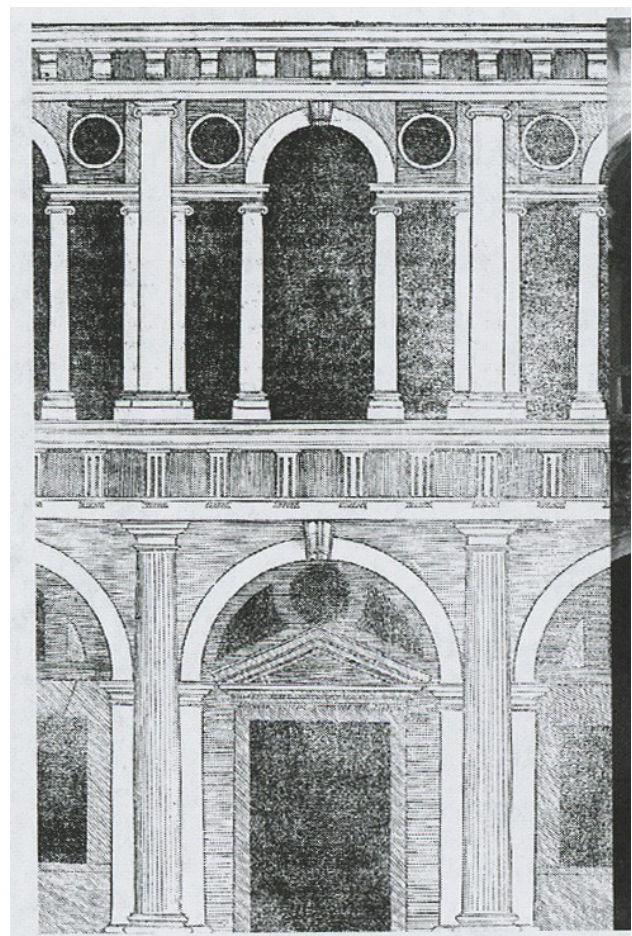


Fig. 54 I Sette Libri dell'Architettura

Elevation - Rustication



Variant: around 1800 nach Barchi/Capelli

Working state

The last element studied for the reconstruction has been the rustication. It is present in the bottom part of each external front of the palace and it increases the monumentality of the building. For its modeling has been taken again as reference a drawing from "I Quattro Libri dell'Architettura" by Andrea Palladio. It shows the elevation of an house decorated on the three levels with rustication composed by long horizontal elements embossed compared to the front surface and not interrupted by vertical subdivisions in the most part of the facade. The same kind of design has been used for the reconstruction, analysing in a more careful way how Palladio resolved the geometry near rectangular windows and arched door, half represented in his drawing.

Reconstruction



Fig. 57 Rustication reconstruction

Sources

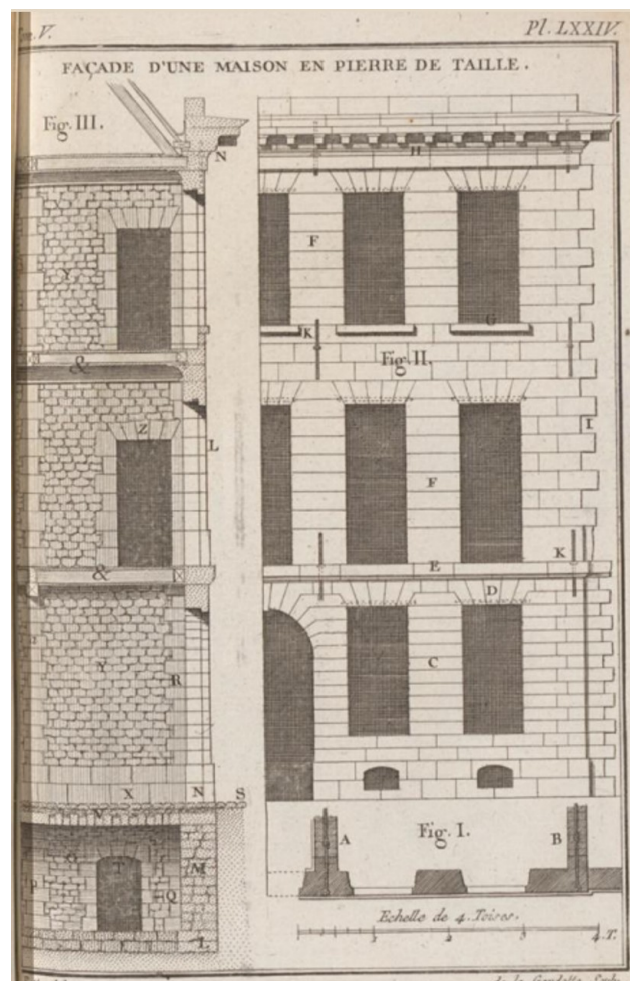


Fig. 56 I Quattro Libri dell'Architettura