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Additional Information

# Graphic survey and analysis of the outer walls and floor plan of the Royal Corpus Christi College-Seminary in Valencia

Carlos LERMA<sup>1,a\*</sup>, Ángeles MAS<sup>1,b</sup>, Enrique GIL<sup>1,c</sup>,  
Jose VERCHER<sup>1,d</sup>, Mercedes GALIANA<sup>2,e</sup>

<sup>1</sup> Universitat Politècnica de València. Cmno. De Vera s/n 46022 Valencia (Spain)

<sup>2</sup> Universidad Católica San Antonio de Murcia. Av. Jerónimos 135, 30107 Murcia (Spain)

<sup>a</sup>clerma@csa.upv.es, <sup>b</sup>amas@csa.upv.es, <sup>c</sup>egil@upv.es,  
<sup>d</sup>jvercher@csa.upv.es, <sup>e</sup>mgaliana@ucam.edu

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**Abstract.** The construction of the Royal Corpus Christi College-Seminary in Valencia was begun in the late sixteenth century. The building was designed in accordance with the principles laid down by the Council of Trent and explained in detail in a treatise by Saint Charles Borromeo. In the present study a laser scanner was used to achieve a high degree of accuracy in tracing the building's outer walls and internal floor plan. The two most important of the outer walls, the south and west, were given special attention as regards regulating lines and different proportional relationships.

## Introduction

The building of the Royal Corpus Christi College-Seminary in Valencia (Figs. 1 and 2) began in 1586, during the Renaissance, which is now more than 400 years old. It is situated alongside the equally historical Valencia University building in the city centre. The College-Seminary covers a considerable area and occupies a complete city block in what was formerly the old Jewish Quarter.

During the Renaissance many religious buildings were put up both inside and outside the city walls. Around 1570, 18 churches belonging to different religious congregations were built in Valencia and it was during this period that the Patriarch Juan de Ribera decided to construct his own religious institution, the College-Seminary, close to the University. The plans used to construct the seminary were based on the Instructions on Ecclesiastical Buildings and Furnishings published by Saint Charles Borromeo [1].



Figure 1. A partial view of the south side of the Corpus Christi College.



Figure 2. Cloister of the Corpus Christi College.

Since no reliable graphic survey of the outer walls and internal layout of the building existed, we used a LeicaScanStation 2 laser scanner to obtain a survey with a high degree of accuracy. After carrying out the planimetry, it was duly analyzed in an attempt to find its different proportional

relationships, especially those of the building's regulating lines, in order to study the building's intrinsic properties.

Other questions taken into consideration were the influence of its fragmented construction in phases without a previously established project [2] on the shape and construction of the building, and the influence of the period, society, economy and culture of the times on its conception and construction.

### Data collection

The bulk of the data was collected by laser scanner (Fig.3) complemented by measurements taken in situ. The laser scanner technique was seen to be especially suitable for the network of narrow streets around the College-Seminary, in which other methods such as photogrammatic rectification would have been difficult to apply.

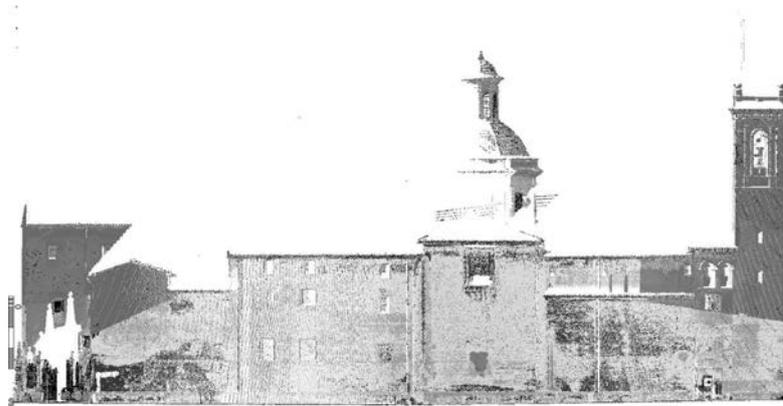


Figure 3: Laser scan of the west side.

### Graphic survey

Elevations of all the sides of the Seminary (Fig. 4) plus a plan of the ground floor (Fig. 5) were drawn from the point cloud generated by the laser scanner and the in situ measurements.

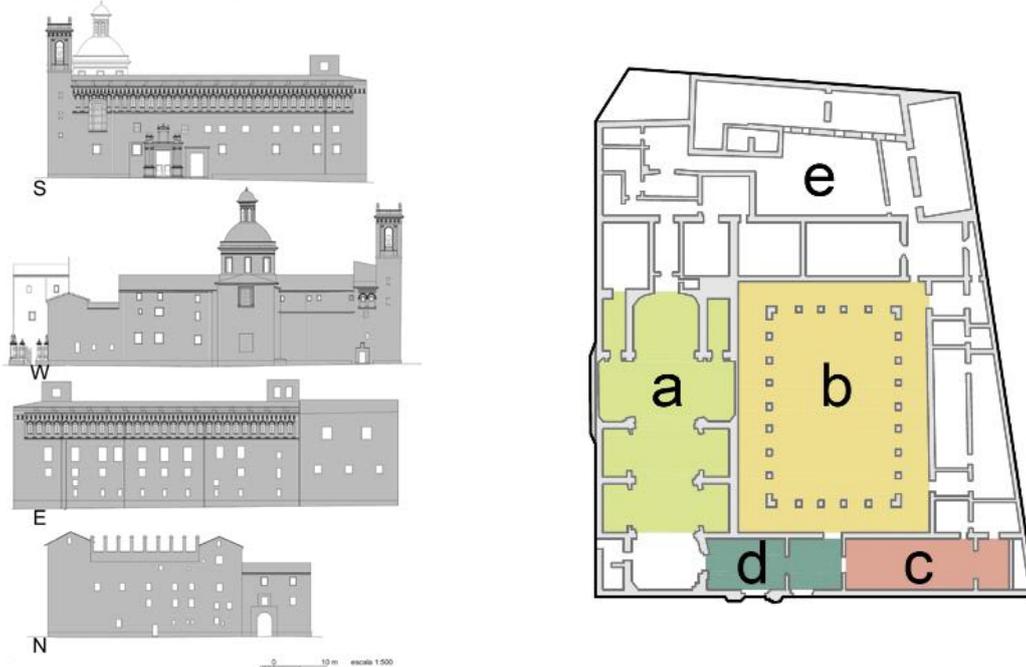


Figure 4. Graphic elevations of the walls of the Seminary.

Figure 5. Plan of the ground floor of the Corpus Christi College in Valencia.

The main divisions of the building are shown in Figure 5: a) The College Chapel; b) the Cloister; c) Our Lady's Chapel; d) Vestibule; e) service area.

## Analysis

The two most important walls, the south and west, containing the building's main gate and enclosing the church, one of its most important elements, were subjected to a study that included the influence of the dome on its supporting drum. It should be pointed out here that the seminary cloister has already been thoroughly studied by [2].

In 1577 Saint Charles Borromeo published the Instructions on Ecclesiastical Buildings and Furnishings, which had an influence on the volumetric conception of the structure. In 1580 a start was made on buying up the houses surrounding the site [3], which leads us to think that the area to be covered by the seminary had already been decided. Some kind of drawing of the building, however, simple, must have already been in existence at this time. Knowing as we do that in 1576 Gaspar Gregori was working on the Cocentaina project, which was signed by Ribera together with the master builders Jaime and Andrés Terol, we are inclined to think that Gregori was the one who produced the first drawings of the seminary [4]. In 1590 Gaspar Gregori's name appears in the contract for the church of the Colegio del Patriarca, but only to supervise the stonework: ... All the stone in this work must be cut from Godella stone (...) under the supervision of Master Gregorio or any other person the Patriarch might appoint ... In this contract [5] Guillem del Rey had to work to previously existing drawings: ... in conformity with the drawings supplied to him ...

The College's account books [6] show entries for expenses from the year 1586, when the work was started, but not before. We know that it was not usual to draw up a contract for making the drawings; this was normally settled by a simple cash payment, as in the case of the drawings made in 1602 and 03 for the Gondi family, and there is no existing documentary evidence. However, it is also true that in the documents drawn up later no mention is made of Gaspar Gregori, or anyone else, being responsible for the drawings.

**South wall.** The compositional aspects of the building and the regulating lines used in its design are best appreciated in the south wall, which includes the main entrance. Figure 6 shows a detail of this wall with the measurements of the most important elements given in both the traditional Valencian handspans (21 cms) and metres. The figure includes a cross-section of the wall at the centre of the main door and the window over its arch.

In Figure 7, below the elevation there is a grid whose module is a Valencian palmo (handspan) (derived from the vara = 0.91m). The legend at the sides is in multiples of 5 handspans. We can also see that the height of the bell-tower and the length of the south wall, including both doorways, are comprised in a distance of 140 handspans. We incorporated horizontal and vertical golden rectangles into this figure, i.e. the proportion between the sides was equal to the golden section (1.618). The contribution of these rectangles is given horizontally and from smaller to larger. The first golden rectangle is aligned with the lower cornice of the upper line of arches and also with one of the columns in the doorway. The second rectangle follows the line of the upper cornice of the arches and reaches the centreline of the window over the right-hand side of the doorway and the end of the left-hand door jamb. The third reaches to the top of the wall on the roof and horizontally to the centreline of the right-hand jamb of the college entrance.

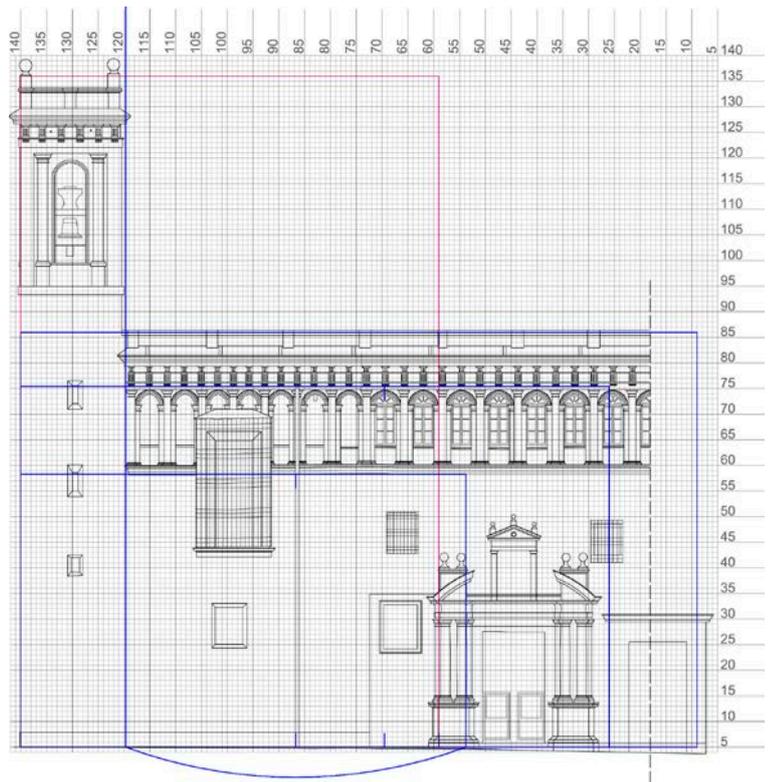
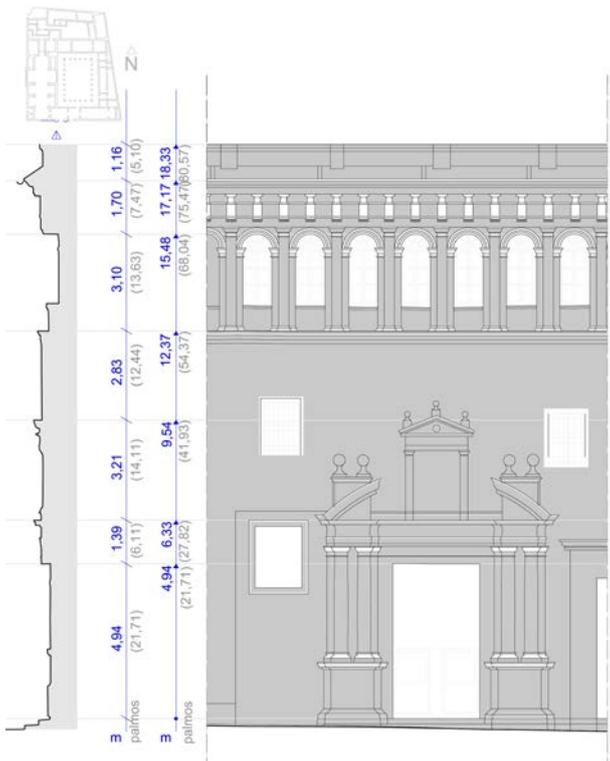


Figure 6. Detail of south wall elevation and cross-section.

Figure 7. Regulating lines in the south wall. Measurements in handspans (Vara = 0.91cm).

**West wall.** The only regulating lines in the west wall are on the right-hand side (Fig.8), the only part that shows evidence of compositional design. Here, we also drew horizontal and vertical golden rectangles. The second rectangle was raised over the first vertical rectangle, which limited us to the height at which the bells are hung in tower. The similarities between the west and south walls can be seen in Figure 9, especially in the similar dimensions, for example, of the height of the doors, the upper and lower levels of some windows, and the relationships between the dome and the bell tower. Another example can be seen in the height of the fascia on the west wall, the height of the roof, which coincides with the lintel of the window of the choir. This is logical if we consider that they both enclose the same space, which is the nave of the church.

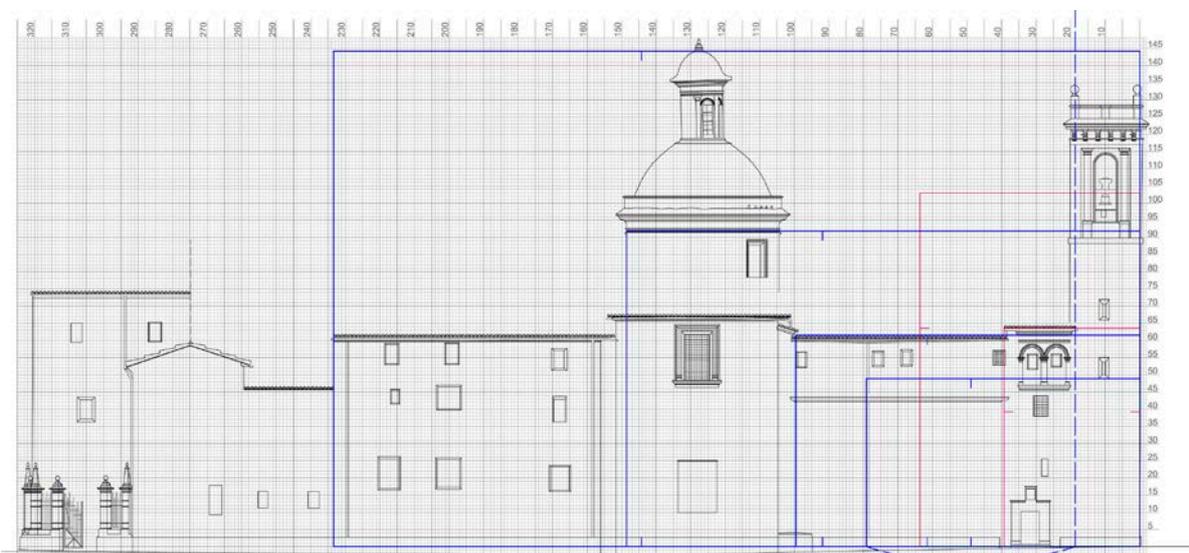


Figure 8. Regulating lines in the west and south walls. Dimensions in handspans (Vara = 0.91cm).

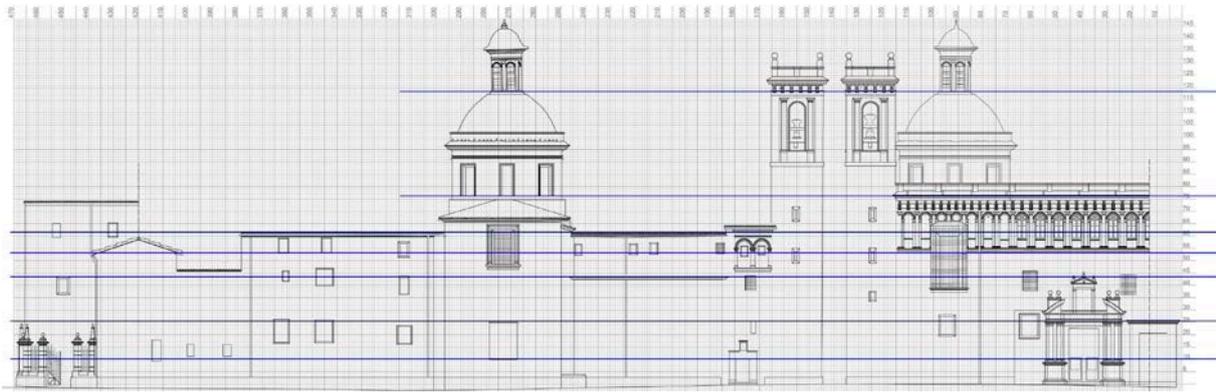


Figure 9. Regulating lines in the west and south walls. Dimensions in handspans (Vara = 0.91 m).

Figure 10 shows a detail of the west wall including the dome of the church. Here again the dimensions of the architectural features, or some of its most important elements, are given in metres and Valencian feet. The cross section follows the centre-line shown in the figure.

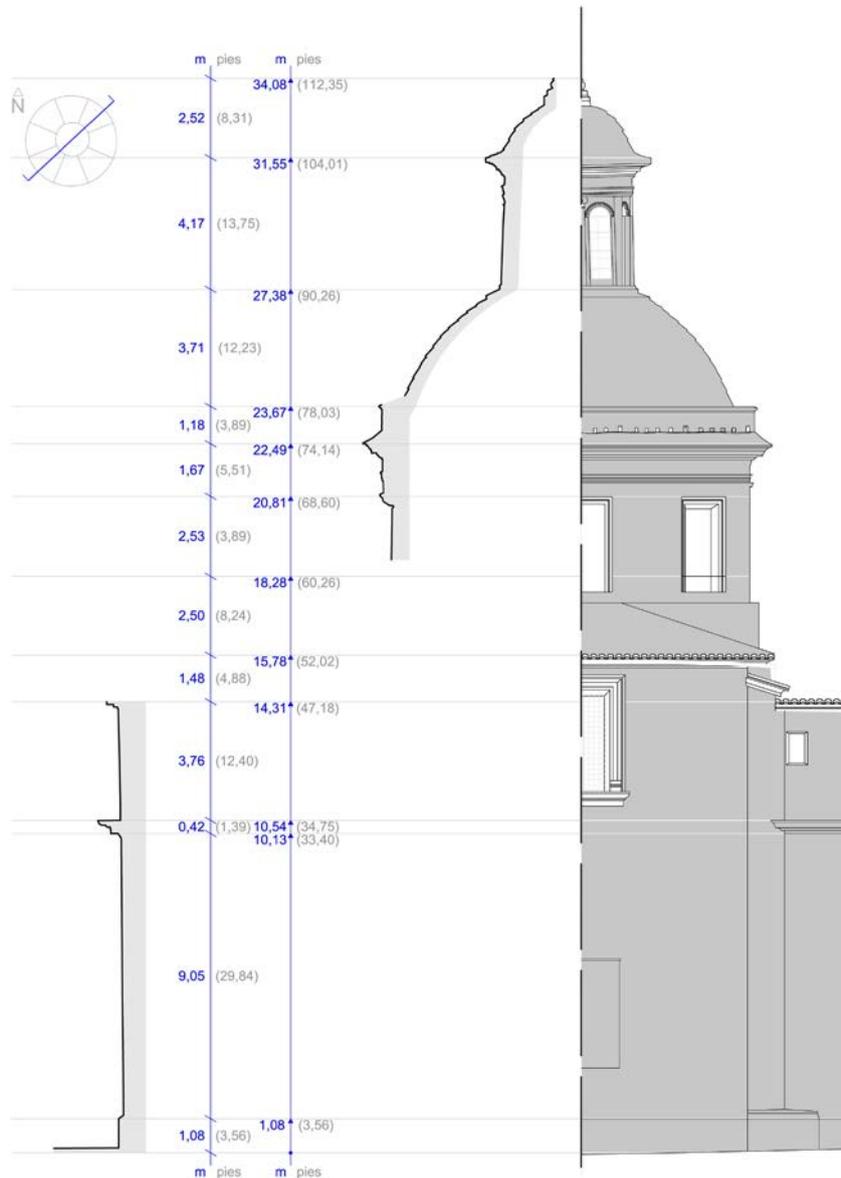


Figure 10. Detail of the elevation and cross section of the south wall.

**Floor plan.** A plan of the ground floor was drawn up from the data collected by the laser scans and the in situ measurements and we then carried out an analysis of its different proportions and regulating lines. This floor was found to follow a model in which the symbolic aspect of the building is given priority over its utility, which is taken for granted if the basic criteria of the different architectural types are respected, and the cross sections of the load-bearing elements are considered to be part of its form [7]. Whoever drew up the general outlines of the ground floor (there is no documentary evidence available as to who did it, but recent studies point to the figure of Gaspar Gregori) must have considered that even though the site was not a rectangle but a trapezium, he had to find the central point of its composition (Figs. 11 and 12), and so he simply found the centre (P1) of the inscribed circle (C1) to which the streets of Nave on the south side, Cruz Nueva on the west, and Carnicols on the east form tangents. It should be remembered that centrality was one of the fundamental ideas of the Renaissance [8].

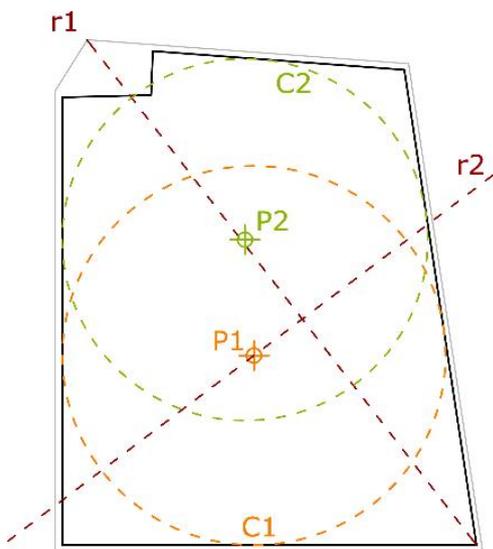


Figure 11. Regulating lines (1).

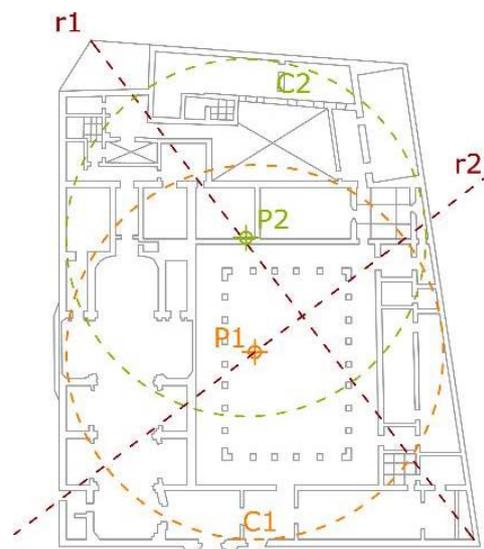


Figure 12. Regulating lines (2).

In Fig. 13 three squares were drawn with their inscribed circles and central dividing lines. In the case of the first square, q1, this line coincides with the columns on the left hand side of the cloister.

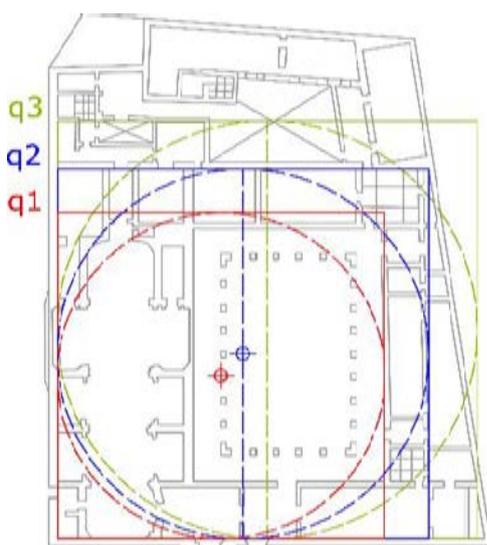


Figure 13. Regulating lines (3).

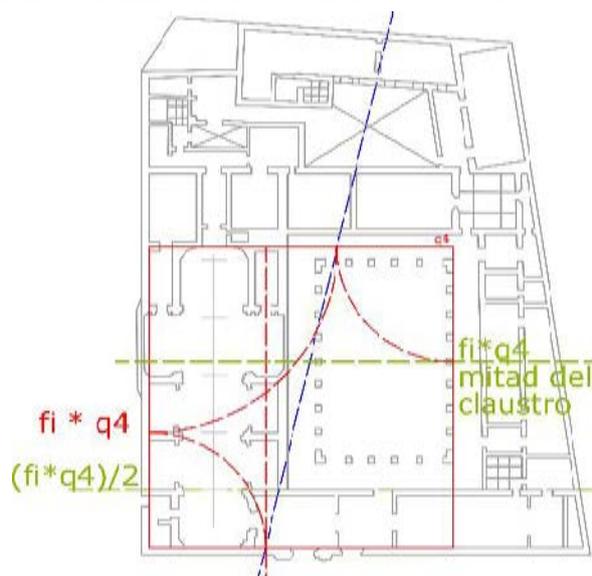


Figure 14. Regulating lines (4).

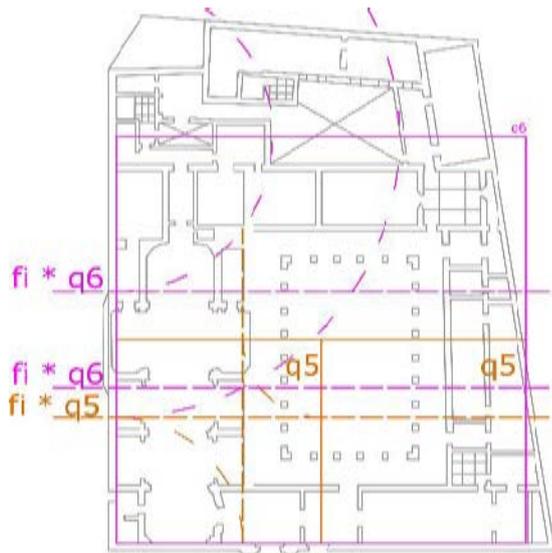


Figure 15. Regulating lines (5).

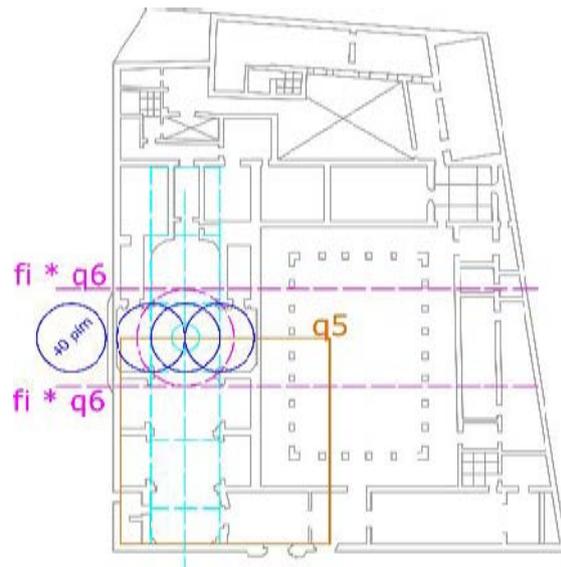


Figure 16. Regulating lines (6).

In Figure 14 we obtained the golden section of all the sides of quadrilateral q4 (“fi\*q4” in the figure). The right hand side of q4 coincides with the columns on the right hand side of the cloister. The golden section on the right coincides with the mid-point of the cloister’s north-south line. The half of the golden section on the left hand side coincides with the internal face of the cloister wall and that of the church. The straight blue line is obtained by finding the golden sections of the upper and lower sides of q4.

In Figures 15 and 16 we continue to find golden sections, in this case in squares q5 and q6. In Figure 14 we drew a dome inscribed within a square of 40 square handspans, as specified in the instructions given to master builder Guillem del Rey. We repeated this module in cyan and obtained 5.5 squares from the foot of the church up to the dividing wall with the service area.

## Conclusions

During the Counter-Reformation architecture was strongly influenced by the work of Saint Charles Borromeo, published in 1577 under the Latin title *Instructiones Fabricae et Supellectilis Ecclesiasticae*, six years before the founding of the Corpus Christi College and nine years before work actually began on its construction. Borromeo’s treatise is in fact cited in the Foundation’s constitution, which was discovered in Patriarch Juan de Ribera’s library. Almost all the conditions stipulated in the Italian treatise were complied with in the seminary built in Valencia, and we can see how the political, social, religious and cultural contexts of the time come together in its architecture.

On attempting to understand the building’s intrinsic properties and the regulating lines of its plans and elevations, we also obtained an insight into the process that might have been followed in designing the Corpus Christi College. It should be remembered that centrality was one of the key ideas of the Renaissance and this concept is evident in the plans of the building. These plans were analyzed to study the proportional relationships between the building as a whole and its different parts, and it was seen that at times the proportion of its parts was already implicit in the principles followed in its design, which were almost always faithfully copied from the treatise.

## Acknowledgements

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