

Studies in 16th Century Construction Project Management:

San Lorenzo de El Escorial and San Pietro in Vaticano

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ARCH 499: Architecture Honors Independent Study

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Introduction

It is common to emphasize the crucial role of the architect in the landmarks of architectural history. This habit becomes widespread during the Renaissance, with the growing importance of the Individual. This results in the collective efforts of countless laborers, superintendents, masons, carpenters, and even other architects, to be neglected, and masked as the fruit of one person's action. The role of the architect develops into that of someone akin to a creator. It is especially the case in examples of elite architecture, which went down in history as landmarks that were often fueled by inflated visions of God or a nation, often surreptitiously intertwined with exaltations of the self. In 16th century Italy and Spain, these visions manifested in endeavors such as the Basilica of San Pietro in Rome, and the monastery of San Lorenzo de El Escorial outside of Madrid. The former, a product of the desire of a line of wealthy popes acting in the name of all Christians; the latter, a memorial for a military victory, monument to faith and knowledge, as well as residence and mausoleum of the Spanish monarchy.

The objective of this paper is *not* to compare the projects in terms of the prowess of their builders, the ingenuity of their architects, the efficacy of construction, nor the legitimacy of the source of their funding. Rather, it is to holistically compare and contrast the *Reverenda Fabbrica di San Pietro* and the *Real Fábrica del Monasterio de San Lorenzo de El Escorial* in terms of their patrons, their politics, the process and progress of the construction at each site (with the associated obstacles), and most importantly, how these manifested in the conditions of the workers and their organizational structure. To achieve this comparison, it is important to observe their similarities and acknowledge the striking effects of their obvious differences, beginning with the terms “*fabbrica*” and “*fábrica*.”

The Italian terms *opere* or *fabbriche* refer to construction institutions that arose the Middle Ages to promote and finance the construction of both religious and secular buildings, administered by secular civilians without the involvement of the Church.¹ In the 16th century, with the construction of new San Pietro, a new type of Fabbrica was instituted: the *Fabbrica di San Pietro*, which was entirely administered by members of the clergy. Since then, the term fabbrica refers to both the construction works and the administrative institution with control over

¹ Marconi 2004 25.

the procurement of materials and labor as well as judicial authority over the *operai*, or workers, of the Fabbrica. In numerous occasions during the 16th century, materials and workers sourced in the site of San Pietro were used in other parts of Rome (for the Villa Madama between 1516 and 1521, under Pope Leo X; repairs to the Ponte Rotto in 1549; and for the Palazzo Farnese in 1550),² a practice which becomes more prevalent towards the 17th century, as the *Reverenda Fabbrica* begins lending equipment, materials, and skilled workers to other projects in the city, growing to become a major construction organization in Rome.³ The Spanish term *fábrica* has several definitions, one of which, shared by its Italian cognate *fabbrica*, is: “fund destined to the reparation of ecclesiastical buildings and to fulfilling the cost of liturgy.”⁴ Another definition refers to the part of a construction work built with masonry and, since the Renaissance, has come to signify the building itself, regardless of its construction method. Thus, in this paper, the term ‘Fabbrica,’ while acknowledging a major construction institution in Rome, refers specifically to both the institution charged with project management, and to the site of the papal basilica in the Vatican. Likewise, the term ‘Fábrica’ refers to both the royal enterprise that administers construction of the monastery of El Escorial, and to the site of El Escorial in itself, including the newer part of the town that became necessary as the project grew.

Before engaging in comparison of these two construction endeavors, it is important to understand their scale and scope. The basilica of San Pietro covers an interior area of about 15,000 m², while the Monastery of El Escorial occupies a surface of about 33,000 m², twice the size of the Vatican basilica. Both construction projects lack clear completion dates, as interior decoration works, smaller additions, and necessary repairs carried on decades after the placement of their last stones. El Escorial’s first and last stones were placed, respectively, in 1563 and 1584, yielding a 21-year-long project.⁵ At San Pietro, these key events took place in 1506 and 1615,⁶ respectively, 109 years of construction. While El Escorial was overseen by a succession of two principal architects, at least nine architects participated in the design of San Pietro.

² D’Amelio 2002 401.

³ McPhee 2008 356.

⁴ Real Academia Española (RAE dictionary): *fábrica*.

⁵ Kubler 1982 31.

⁶ Marconi 2007 80. 1615 marks the demolition of the partition wall that separated the new from the old Basilica, and after this demolition the church was ready to use. Nonetheless, common accepted project length is of 120 years, with the end marked by the consecration of the church in 1626.

Besides the size and stature of these important 16th century constructions, their magnitudes as landmarks in the course of architectural history are different. This is reflected in the varying level of scholarship and documentation available for this particular study. The inception and construction of San Pietro are both heavily documented and investigated, resulting in very exhaustive information (starting at least between 1530 and 1546) pertaining to the different design changes, the ebbs and flows in the course of construction, and adjacent projects of the Fabbrica. The extensive process of construction for San Pietro is reflected in the more sparsely documented beginning period (1505-1529), marked by a regularization in documents and ledgers in 1529, after which details relating to the Fabbrica become more granulated. On the other hand, the 20 years during which El Escorial was under construction are overall more meticulously documented, but the monastery is a less widely researched topic in comparison. Though there exist lengthy, richly detailed tomes that investigate both projects,⁷ these were not readily available for the purposes of this study, and thus, much knowledge held in these books is left to speculation alongside the specific information that *was* available.

San Pietro

After a determination that the Old Basilica of San Pietro was irreparable, a congregation of cardinals and Pope Julius II decided that it should be demolished and replaced. In 1505, demolition began. The Old Basilica was located just north of the Circus of Nero, where the apostle St. Peter had been martyred and crucified, and over the presumed site of his tomb. The new basilica was constructed over the Old one, on the marshy grounds that lay northwest of the Tiber River. This location caused problems for the new construction: improper drainage of the foundations, and differential settling due to the remnants of the ancient Roman circus on the site. The new church came into being alongside its 4th-century counterpart. As one structure grew from the apse eastwards to its nave, the other receded as it was gradually demolished. The project was a 120-year endeavor with a pace that fluctuated with the political circumstances as these affected the availability of funds and, as a result, materials, and labor. The Catholic church did not on its own have enough gold in its treasury to finance this project, and much of the funding flowed in from the Crusades led by the Habsburg king in Spain against Muslims, Jews,

⁷ These include *La basilica di San Pietro. Da Michelangelo a Della Porta* by Federico Bellini, or *La octava maravilla del mundo. Estudio Histórico sobre el Escorial de Felipe II* by Agustín Bustamante García, to name one for each project.

and pagans in North Africa and the Middle East. The rhythm of construction was significantly affected when the inflow of Spanish gold slowed. The final product, the greatest of all Churches, would mark the center of pilgrimage for the Catholic faith.

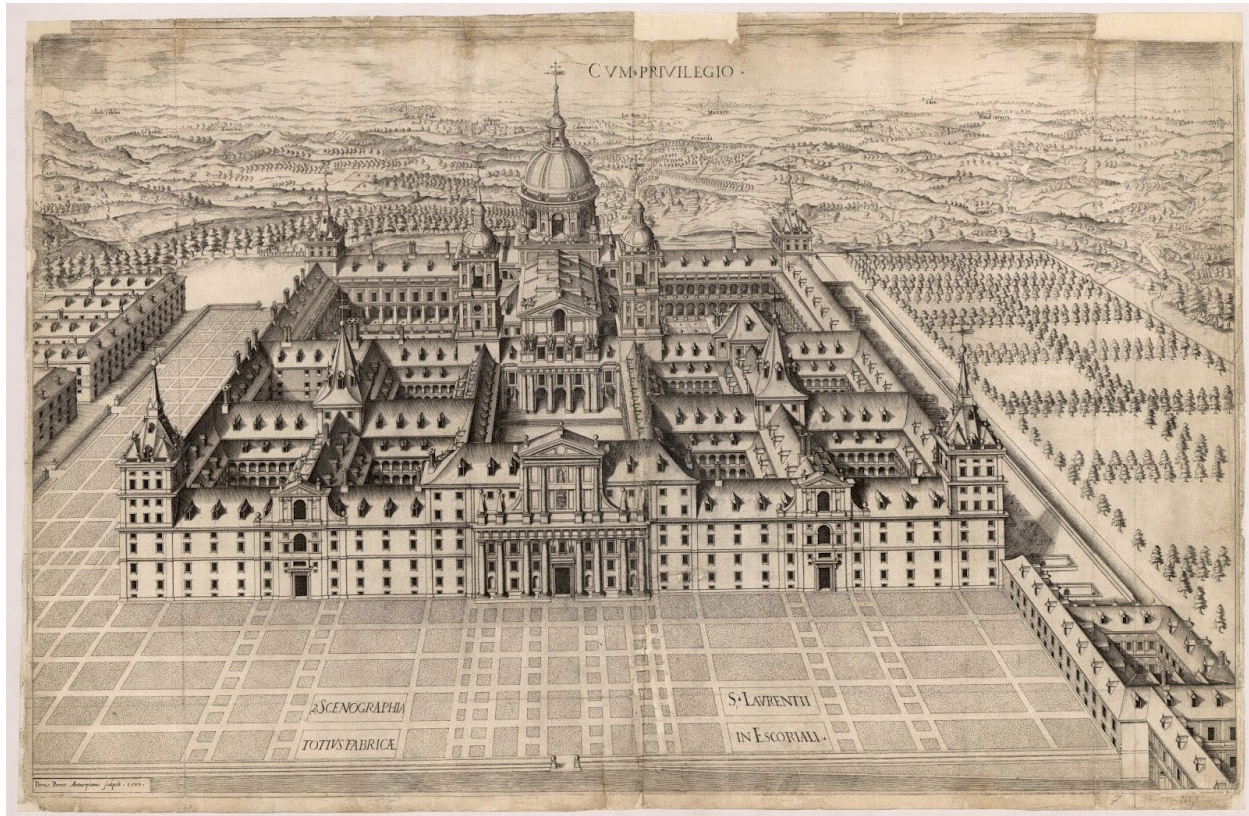


Figure 1. “*Perspectiva general del Monasterio de San Lorenzo de El Escorial*” 1587 Pedro Perret. Museo Nacional del Prado. Engraving.

El Escorial

Nearly sixty years into the demolition and rebuilding of Old San Pietro, Philip II of Spain was envisioning the construction of a great monastery that would also serve as the royal residence of the monarchs of Spain. This project commemorated the victory of the king’s armies at the battle of Saint Quentin in northern France in 1557. Five years after the battle, seven since Philip II’s crowning, the first final plans were completed by Juan Bautista de Toledo. As the design developed, monks of the Hieronymite Order contributed their knowledge of clerical institutions, noting the practical concerns for the functions of a monastery. In combination with the Order, the architect, whose ideas were initially supplemented by those of other architectural consultants the Philip called upon from Italy, shaped the building to serve both aesthetic and

practical purposes.⁸ Juan Bautista had previously served the King in designing his Palace in Aranjuez, and he was subsequently called upon to design a complex fit to the King's wishes. Philip II's esoteric curiosities, especially his fixation with the temple of Solomon, gave El Escorial a prophetic meaning. The final construction emulates an interpretation of the ancient temple found in the visions of Ezekiel, whereby the temple marks the axis of symmetry of the complex, with courtyards on either side. In El Escorial, the central axis aligns the King's private palace, the basilica, the Courtyard of the Kings, which precedes the entrance to the basilica, the library, and the western entrance. The complex also includes a palace for nobles, as well as a school, and rooms for the clergy.

The Patrons

The Monastery of el Escorial was commissioned and built under a single king, advised by monks, architects, and a council of noblemen appointed by the monarch. The personal connection he felt to the monastery harnessed a large part of his focus, which contrasts with the mixed motivations of the several popes that reigned during the construction of San Pietro. King Philip II delegated constructive decisions in his architects Juan Bautista, later Juan de Herrera, and the master workman of the project, Fray Antonio de Villacastín.⁹ From 1562 to 1590, the period encompassing the construction, Philip's attention fluctuated between maintaining or expanding his empire by spending on military campaigns, ruling in his territories in the Iberian Peninsula, and directing gold from the Americas into the construction of his monastery.

In Rome, by contrast, at least eighteen popes lived during the construction of the basilica, counting from the start of the work under Julius II through Paul V, whose name appears on the façade of San Pietro. For the Catholic church, completing the basilica was a priority, but papal approaches and attention to the Fabbrica varied by pope. Some chose to focus on public works throughout Rome, many others dealt with warfare. Others focused on obtaining the means to finish the basilica. As we shall see, the pontiffs Leo X, Clement VII, Sixtus V, and Paul V stand out for their part in altering the administration of the Fabbrica ranks that were above the architect, and for instituting and dismantling different committees and congregations for the legal and financial management of the enterprise.

⁸ Kubler 1982 20.

⁹ Ibid.

Philip II and El Escorial

The years between the abdication in 1556 of Charles V of the Holy Roman Empire (and King Charles I of Spain) and the relocation in 1561 of the Courts of Castille from Valladolid to Madrid by Philip II are crucial in setting the stage for the Monastery of El Escorial. In 1556, Charles renounced the throne and retired to a monastic life in the Monastery of Saint Hieronymus of Yuste, 90 miles southwest of El Escorial. In 1557, Charles's son Philip II takes the throne and strives to annex Northern France to Spanish Flanders. The resulting Battle of Saint Quentin against the French yielded a Spanish victory. In 1558, Charles I died in Yuste, in his bed, from which he had a window into the grand altar in the church of the monastery. Philip II, a staunch believer in destiny and scholar of the esoteric, viewed himself in the likeness of the ancient Israelite king-priests, and wished to build his own Solomonic Temple. He followed in his father's footsteps, with the wish to retire to a monastic life, and eventually die in his own Hieronymite monastery. Not only as a token of faith for his military victory on the feast day of Saint Lawrence, but also a monument to wisdom and a compendium of knowledge, Philip II decided to build the Real Monasterio de San Lorenzo de El Escorial.¹⁰ The complex housed the King's residence, and from 1573, his own and his family's mausoleum. The location of these programmatic elements, on axis with the temple, speaks to the personal nature of this project for the Philip II, whose rooms were directly to the right of the grand altar in the basilica. He lived in his completed Monastery until his death in 1598, on his bed overlooking the altarpiece of his Temple.

The Pontiffs and San Pietro

Papal involvement in the New Basilica began during the pontificate of Julius II (r. 1503-1513), when he commissioned the rebuilding of the basilica in 1503, and began selling a new indulgence to fund construction in 1507.¹¹ Julius II's successor, Leo X (r. 1513-1521), is remembered for the indulgences he granted to contributors to the funding of the New Basilica.¹² Clement VII (r. 1523 and 1534) instituted the *Collegium LX Virorum*, a committee of cardinals, ambassadors and other prelates that oversaw the administration of the Fabbrica, in an effort to

¹⁰ Chueca Goitia 1981 47.

¹¹ Dandele 2008 42.

¹²Ibid. The sale of said indulgences irked Martin Luther into publishing his Ninety-five Theses in 1517, for which Leo X excommunicated him in 1521.

emphasize that the church was “the work of all Christians.”¹³ He hid in Castel Sant’Angelo during the Sack of Rome by the troops of Charles V of the Holy Roman Empire in 1527, which reasonably brought work at the Fabbrica to a standstill. Clement VII later crowned Charles V’s son, Philip II, Emperor. Paul III (r. 1534-1549) extended the Bull of Crusade Indulgence as well as the Bull of San Pietro, pardoning the Spanish-led bloodshed across North Africa and the Levant, and directing the stolen riches into the Fabbrica.¹⁴ These indulgences were renewed by Julius III (r. 1550-1555), interrupted by Paul IV during his pontificate (r. 1555-1559), and then again renewed by Pius IV (r. 1559-1565).¹⁵ Pope Gregory XIII (r. 1572-1585) gave a name to the Gregorian Chapel, west of the right transept in San Pietro. Pope Sixtus V (r. 1585-1590) mobilized the Fabbrica to several public works throughout Rome, completing not only the dome of San Pietro, but also carrying out repairs in churches such as San Giovanni in Laterano, ordering the cutting of a new network of streets, and the placement of several obelisks, including one outside the new papal basilica. Sixtus V also restructured several Vatican committees, including the *Collegium* that governed the Fabbrica. He named the archpriest of San Pietro prefect of the Fabbrica, as a way to limit the power of the *Collegium* over the enterprise.¹⁶ Though the wars against the Ottoman Empire in the last decade of the 16th century took up a good portion of papal attention, there still remained enough for the Fabbrica, even when the pope took an adversarial role to the completion of the project as we know it: Clement VIII (r. 1592-1605) secretly opposed the full demolition of Old San Pietro, and commissioned both the internal decoration of the New Basilica, and the restoration of the roof of the Old Basilica.¹⁷ During his pontificate, Paul V (r. 1605-1621), who opposed Clement VIII’s ulterior motives, dissolved the *Collegium* founded by Clement VII in 1524, and instituted the Sacred Congregation of the Fabbrica of San Pietro, which remains in place until 1968.¹⁸ Additionally, Paul V orders the demolition of what remains of Old San Pietro, and commissions the construction of the new façade designed by Carlo Maderno, which bears his name.¹⁹

¹³Dandelet 2008 44, Marconi 2004, 27.

¹⁴Dandelet 2008 45.

¹⁵Ibid. 46.

¹⁶Marconi 2004 27.

¹⁷Marconi 2007 75.

¹⁸Ibid. 76.

¹⁹Ibid. 75.

in the different administrative bodies that ruled the Fabbrica (committees, the *Collegium*, and the Congregation). The wishes of one pope did not carry very far in the course of history. Julius II in 1505 endorsed the full demolition of Old San Pietro, but this did not effectively happen until a century later, under Paul V, and even then, popes like Clement VIII had attempted to restore the Old Basilica to see Old and New coexist at the Vatican site. While all popes probably wanted to see New San Pietro to completion, they seem to have envisioned that in a myriad of different ways, as evidenced by the countless different iterations that the design of the basilica underwent. Some popes were fortunate to rule for decades, others reigned for mere days. All popes had competing motivations. They held different political allegiances and granted Bulls to pardon Crusaders, reaping the profits that came from the Holy Land and Northern Africa. Particularly, the papal allegiance with Spain had the greatest effect on the completion of the basilica given that, as we shall see, it was Spanish gold that largely funded its construction.

Funding

While Philip II rearranged royal properties and secured sources of funding for his monastery in Spain, he also provided a large portion of the funding for San Pietro. This was in continuation of Charles V's endowments for the construction of the new basilica, which in turn stemmed from the relationship of Charles' father, Ferdinand II of Castille, with Pope Julius II. While Ferdinand did not begin donating funds to the construction, the pope had granted him the first bull of the crusade in 1504, and they had mutually aided one another in military campaigns.²⁰ From the start of construction, one great driver of productivity at the Roman Fabbrica was the inflow of Spanish gold into the papal coffers.

The following survey recounts the provenance and unsteady influx of funds at the Italian Fabbrica, a survey limited to the first 75 years of work due to the sources available for this study. The first indulgence for the construction of the basilica (the Bull of San Pietro), issued by pope Leo X in 1513, was criticized in Spain nearly as much as by Martin Luther. Much of this criticism was on the grounds that said indulgence would draw money away from Spain. As a response, after his crowning as king of Spain in 1519, Charles I of Spain (Charles V of the Holy Roman Empire), struck a deal wherein the indulgence of the Bull of San Pietro was no longer

²⁰ Dandeleit 2008 43. After the Reconquista and the siege of Granada in 1492, the Catholic monarchs were still carrying out military campaigns beyond the Peninsula, venturing into North Africa and the Levant.

preached in Spain, but a portion of the crusade indulgence was regularly sent to the Fabbrica. The rise of Clement VII to the papacy in 1523 saw a sharp decrease in the Spanish funding, as a result of the pope supporting the French against Charles V, and this slowed demolition of the old basilica.²¹ As Clement VII reorganized the Fabbrica by founding a *Collegium*, a committee of 50 cardinals in 1524, he attempted to internationalize the project, calling different catholic ambassadors to the *Collegium*, in an effort at denoting that the basilica is the work of all Christians. In 1527, the troops of Charles V sacked Rome, and work at the basilica comes to a standstill. It is unclear when work can return to normal after this bloodbath, but in 1529, all ledgers of the Fabbrica become regularized by papal mandate.²² Clement VII's successor Paul III (r. 1534-1550) enjoys better relations with Charles V than the previous pontiff, as Paul III supports Charles' military campaign against the Ottomans in north Africa. One fruit of these improved relations is the influx of one hundred thousand ducats every six years to the Fabbrica. In 1538, the establishment of the Spanish state in Naples provides a regular income source beside the sexennial sum.²³ By 1540, a regular rhythm of work at the basilica resumes. In the following pontificate, Julius III (r. 1550-55), once again renews the crusade indulgence. At this point, Spanish gold accounts for about sixty-five percent of funding for the basilica, and work proceeds briskly. When Paul IV becomes pope, in 1555, a period of hostilities ensues between Spain and the papacy. Thus, payments to Rome stop, and workers start receiving only a third of their previous salary until the death of the Neapolitan pope in 1559. It is during Paul IV's papacy that Philip II becomes king and wins the battle of Saint Quentin. Under Pius IV (r. 1559-1565), the crusade indulgences return, but they are not actually paid out to the Fabbrica until 1565.²⁴ By this time, construction has begun at El Escorial. Work at San Pietro returns to normal pace with the ascent of Pius V to the papacy in 1566, and the victory of the Holy League (Spain, Papal State, and Venice) at Lepanto in 1571 strengthens the relationship between Rome and Madrid, ensuring patronage of the basilica. The decade of 1570 again saw delayed payments to the workers both in the Vatican and at El Escorial.²⁵ The spotty funding of construction at the basilica hints at the wavering progress of the works.

²¹ Dandele 2008 44.

²² Ibid. 45.

²³ Ibid.

²⁴ Ibid. 46.

²⁵ Cano de Gardoqui García 2002 166.

The network of the Fabbrica was initially limited to the project site at San Pietro, but after the 16th century it eventually circulated workers, materials, and even equipment throughout various project sites in the city of Rome, though San Pietro was often, if not always, first in priority for such goods and services.²⁶ At the Spanish Fábrica, laborers were called upon to the site by street criers who announced the bidding of work all over Spain, and materials and provisions were marshalled to the center of the peninsula.²⁷ The construction of El Escorial required large sums of money, used not only for works at the construction site, but also for public works meant to ease transportation to the monastic complex and provide a steady supply of provisions for the laborers.²⁸ The Fábrica itself became central to the employment of construction professionals in the Iberian Peninsula in the second half of the 16th century. Thanks to Philip II's personal involvement in the project, the accrual and disbursement of funds for El Escorial was minutely followed and documented by a series of *contadores* and *pagadores* (accountants and paymasters), as ordered by the monarch, which allow us to pinpoint the total cost at around five million ducats.²⁹ The exhaustive documentation of funding shows that cashflow was generally stable, apart from the first five to ten years of the project. In these early years, while new sources of funding had to be secured, the rhythm of construction slowed, even stopped at times. As a result, among the new sources of income that I shall discuss next was the return of monies that had been previously lent by the Fábrica to other Royal Works, such as the Palace of Aranjuez or the Alcázar in Madrid, both designed by Juan Bautista de Toledo, and which were closer to completion at the time of the loan.³⁰

The main sources of cash for the Crown within its possessions in the Iberian Peninsula were taxes, which were collected at the provincial, local, and parish levels. Church taxes and certain Papal indulgences allowed Philip II to collect money from Christian peasants and nobles alike. Additionally, extensive, and redundant customs taxes on salt, silk, wool, and other imported and exported goods reached the royal coffers, along with money collected as fines.³¹ The king also made use of his colonies in the Americas, funding from which became regular

²⁶ McPhee 2008 368.

²⁷ Cano de Gardoqui García 1989 221.

²⁸ Cano de Gardoqui García 2002 151.

²⁹ Ibid. 128.

³⁰ Ibid. 133.

³¹ Ibid. 135.

after 1565. The most common imports were precious metals, like Argentine silver and Inca gold, and slaves, for whose introduction to Spain slaveowners had to pay taxes.³² Many nobles, such as the Count of Medellín, were granted permission by the king to levy their own taxes, on top of those already destined to the crown, in exchange for a regular cashflow into the Fábrica at the Monastery. Philip II was also in contact with bankers from Lombardy in northern Italy, who granted him credits and loans for the purpose of this project. Some nobles even offered monthly contributions of thousands of ducats in exchange for princely titles, which Philip II eventually stopped granting.³³ Lastly, a smaller contribution to the funding of the Fábrica was the resale of surplus materials and bread sales to the workers.³⁴

In the same way that, among the other royal works simultaneously under construction, the flow of cash was directed mainly towards the monastery, so too was the production of construction materials and provisions for the workers who began to live at El Escorial. One of the many reasons for moving the courts from Valladolid to Madrid in 1561 was the proximity of the city to the construction site. The new capital of Madrid experienced heavy growth during the period overlapping the construction of the monastery, with an average of 150 houses constructed annually. This speaks to the availability of workforce around Madrid, and the necessity to recruit labor and harvest provisions from other parts of the Castilian region. Both during and after construction, the Royal Monastery was supplied by a series of royal abbeys and hamlets around Madrid. In 1563, Philip II purchased the village of La Fresneda and several adjacent plots of land, where Hieronymite monks resided from 1569 until they moved into their finished quarters in the Royal Monastery in 1571. El Quejigal was purchased in 1564 with the purpose of providing timber for the works. Once the pines in the property were sawn and sent to the Fábrica, vineyards and olive trees were planted, yielding harvests so bountiful that they required the refurbishment of the hamlet. El Santo (or the hamlet of San Saturnino) and its extensive pastures also provided cattle, wine, and oil for the monastery both during its construction, and once it was in operation.³⁵ In 1595, the king bought two additional small villages: el Campillo and Monesterio. He expelled the villagers and turned the lands into pastures and hunting grounds. The pastures were farmed by Hieronymite monks to supply the new monastic compound, and the

³² Cano de Gardoqui García 2002 136.

³³ Ibid. 137.

³⁴ Cano de Gardoqui García 1989 226.

³⁵ Martínez Leiva 2015 (II), Martínez Leiva 2015 (I).

hunting grounds were used for Philip's leisure while he vacationed at his new royal residence.³⁶ Additional hamlets and abbeys were purchased with the intent of supplying wheat to the Fábrica, until the installation of wheat storage on site in 1571.³⁷ The extent of the Fábrica's demands reached out radially towards quarries in Burgo de Osma and Bernardos, mines as far as Villaverde in Euskal Herria, and farms as far as Villa del Campo in Cáceres, nearly in Portugal.³⁸

It would be fascinating to understand the use of quarries, woods, and properties in the city of Rome and its surroundings for the purpose of material procurement for the basilica. Arguably, the furnishing of travertine from the Tiburtini mountains, timber from the woods of Lazio, iron from Orte and Turano, and lime and pozzolana from the Roman countryside, among others, contributed to the economic development of said territories.³⁹ This appears analogous to the use of royal properties for the supply of not only the construction of the Monastery, but also its operation. This raises the questions of whether the pope would have even been able to acquire properties for the purpose of material procurement and supplies, and whether that practice was prevalent prior to the start of the new basilica. Nonetheless, the feasibility of a point-to-point comparison is constrained by the available research, and the complexity of the Vatican project. The Fabbrica at its inception was limited to San Pietro, but its growth as an institution extended its arms over the city of Rome, lending materials and laborers, and probably also dominating the procurement of constructive resources, since virtually no institution in 16th-century Rome could rival the dominion of the Fabbrica over the city's building industry.

³⁶ Martínez Leiva 2015 (I).

³⁷ Cano de Gardoqui García 1989 223.

³⁸ *Ibid.* 219.

³⁹ Vaquero Piñeiro 1995 159.

The Course of Construction

El Escorial: Location and Sequence of Construction

At the same time as the initial plans for the monastery were delivered to the King in 1561, a search for the optimal site was underway.⁴⁰ It is unclear whether the first plans preceded the choice for the site. A council of doctors and wisemen were sent by the King to evaluate a potential site. This was a sunny esplanade, previously a pasture, shielded by mount Abantos on the northwest, with a breathtaking and strategic view of the Sierra de Madrid and the southern half of the Central Iberian Plateau. The choice for the site follows the guidelines set forth by medieval Castilian monarch Alphonse X “the Wise” pertaining to places used for studies. He advised that such locations must enjoy “good air” and “beautiful views,” as well as an area “well-supplied by bread and wine.”⁴¹ The location of the site, nestled in the mountains, allowed for the channelization of numerous creeks and brooks, harnessed on their way to the lowlands to provide running water to the Monastery, its construction site, and several mills constructed to furnish the town and the Fábrica.⁴² Before finalizing the decision, Philip II visited the site described as “a rocky amphitheater at the foot of the mountains.”⁴³ Juan Bautista de Toledo, who accompanied the king to the site, decided that the southern façade of the complex should not be exactly aligned to the cardinal direction but rather, that it should angle slightly to the east, so as to ensure that the royal dependencies enjoyed as much sunlight as possible in the winter.⁴⁴ The King ordered the driving of the stakes marking the four corners of the site, and decreed the site (*Sitio*) of the Fábrica to be just northwest of the village of El Escorial in 1561. The proximity to the small town, which grew significantly as construction progressed, made it easy for workers to take up residence there, and allowed for the establishment of institutions like a wheat storage and a free hospital for the workers.⁴⁵

⁴⁰ Chías Navarro 2016.

⁴¹ Alfonso X el Sabio qtd in Ortega Barnuevo 2016 52.

⁴² Chías Navarro 2014.

⁴³ Ortega Barnuevo 2016 53.

⁴⁴ Chías Navarro 2016.

⁴⁵ Cano de Gardoqui García 1989 217.

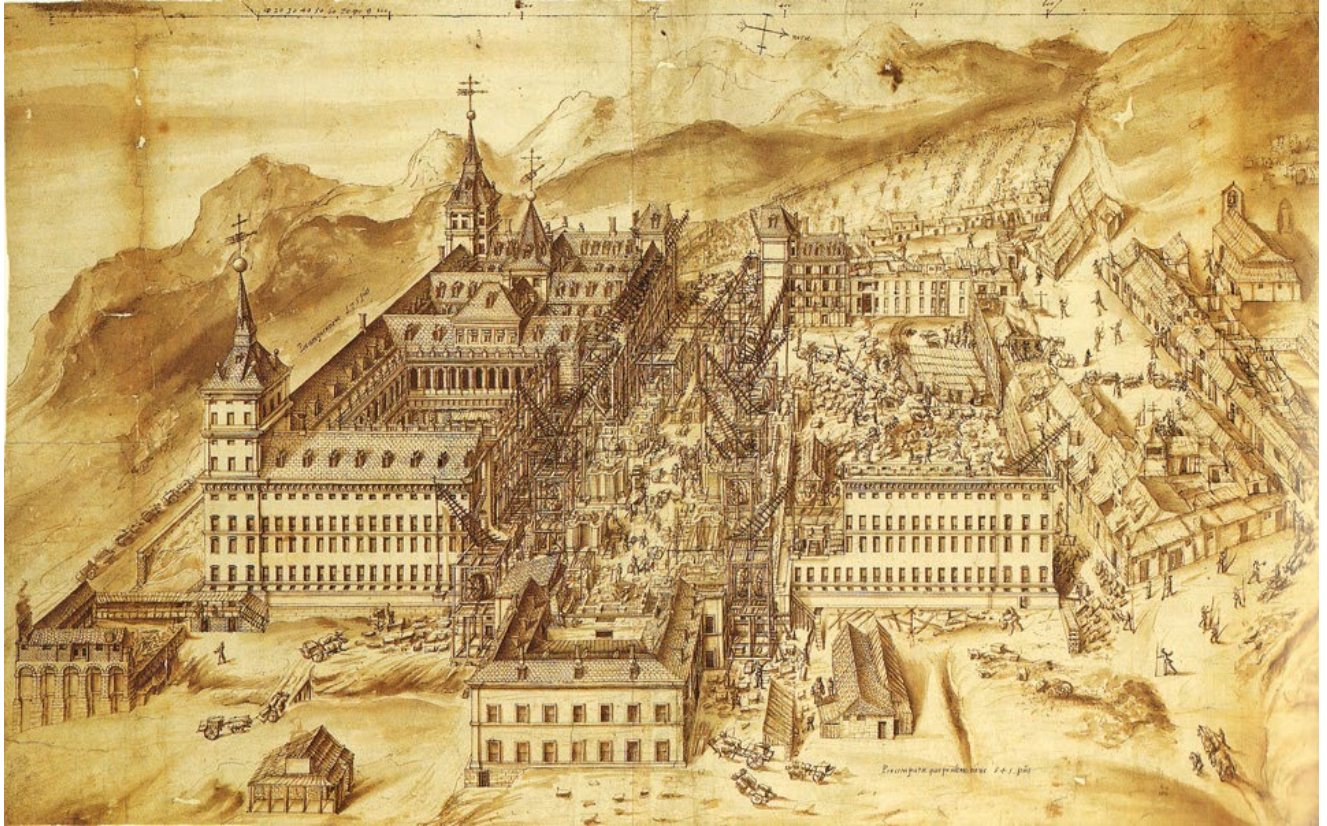


Figure 3. “El Escorial under construction.” 1576, Attributed to Fabrizio Castello. Hatfield House, collection of the Marquis of Salisbury. Engraving. View looking west.⁴⁶

Construction started on the south and moved north, continuing from the outside in with the construction of the basilica. In 1562, groundbreaking began in the southern border of the delineated rectangle. The southeast corner of the site required the construction of heavily buttressed retaining walls, which were filled in to level the rectangular esplanade required by the site. Construction began with digging the foundation of said retaining wall, which required about 200 men.⁴⁷ By 1563, when Philip issued the first Royal Instruction pertaining to the government and administration of the Fábrica, the southwestern tower of the complex was underway, as the foundations for both the retaining wall/façade and tower emerged from the ground.⁴⁸ In 1564, the buttresses of the southern retaining wall were completed in their full height, and in 1565 a second Royal Instruction divided the Fábrica into zones: the southwestern small cloisters, the rest

⁴⁶South portion of the complex appears complete including the retaining walls (left), while the royal palace (small construction in the middle foreground) stands finished outside of the cranes devised by Juan de Herrera for the construction of the basilica (middle). Notice the open courtyard beyond the basilica, temporary constructions to the north (right) of the project, and the completion of some exterior walls in the Northern half of the complex (right).

⁴⁷ Chías Navarro 2015 28.

⁴⁸ Ibid. 29.

of the southern façade, and the main staircase of the monastery were under the control of the Congregation, while Juan Bautista and his master builders took charge of the emerging church and the larger, southeastern cloister.⁴⁹ Juan Bautista died in 1566, leaving the Fábrica without a leading architect until Juan de Herrera is appointed principal architect in 1572, though he was already an assistant to Juan Bautista. Up until 1569, about 650 workers had been present at the site, and the procurement of materials, food, and salaries had been irregular. The number of workers increased to 2,000 or 3,000 when the basilica began.⁵⁰ In 1569, the southeastern cloister, for which the retaining wall was crucial, began to be laid out. By the following year, 1570, the grand staircase of the monastery had been started, and it was concluded in 1573.⁵¹ In 1575, a flu epidemic among the builders slowed work for two months.⁵² The following year marks the beginning of construction of the basilica, the period during which the Fábrica reaches its highest population, between two thousand and three thousand men.⁵³ The Hieronymite community had taken residency in the monastery in 1571 (within the two cloisters south of the basilica), and they were cramped while the northwestern cloisters designated for the college were under construction. Information on the succeeding decade is limited, and the next significant milestone was the laying of the last stone on the Courtyard of the Kings in 1584.⁵⁴ In 1586, the Basilica was finished. At this time, the Courtyard of the Kings, which precedes the entrance to the Basilica, was already paved.⁵⁵

⁴⁹ Chías Navarro 2015 32.

⁵⁰ Cano de Gardoqui García 1989 216.

⁵¹ Chías Navarro 2015 32.

⁵² *Ibid.* 33.

⁵³ Cano de Gardoqui García 1989 216.

⁵⁴ Kubler 1982 31.

⁵⁵ Wilkinson Zerner 1993 100.

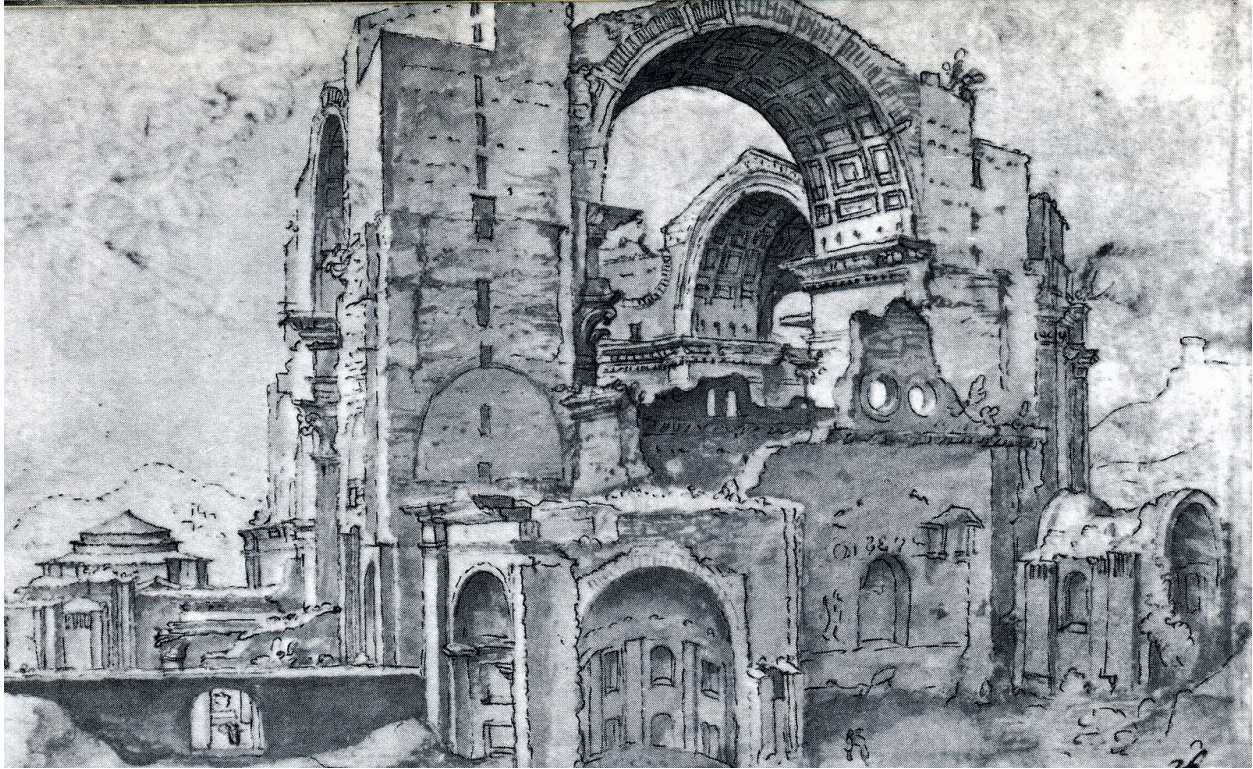


Figure 4. "San Pietro under construction." ca. 1536, Maarten van Heemskerck. Drawing.

San Pietro: Location and Sequence of Construction

Construction of the Vatican basilica began in 1506. At this point, the bulk of the work consisted in demolishing the existing Old Basilica to make way for the new one. Documentation of the process of construction between the beginning of the works and Michelangelo's involvement in the Fabbrica in 1546 is sparse. During the few early years of the project in which work progressed adequately, the deep foundations for Bramante's massive pillars serving as pendentives for the dome were being excavated, continuously drained in the process. The sack of Rome in 1527 resulted in a construction hiatus that would last several years. In 1538, a dividing wall was erected, separating the old basilica from the new. Under Michelangelo, the northern transept was vaulted, and some ambulatories built under Raphael's supervision were still under demolition.⁵⁶ Some of the work constructed under Sangallo was also demolished in 1548, and this process lasted well into 1557. Once the ambulatories behind the apse were eliminated, in 1549 the vault covering the southern transept was concluded.⁵⁷ By 1550, the allegiances of the reigning pope with the Spanish monarch allowed for crusade indulgences to reach the workers at

⁵⁶ Bellini 2001 75.

⁵⁷ Ibid.

the Fabbrica, and work resumed at a brisk pace again. In 1552, the base for the dome drum was finished.⁵⁸ In 1553, the apse began construction after the demolition of the ambulatories from the 1510s, and in the following years the engaged exterior columns and interior pilasters of the dome drum were completed.⁵⁹ In 1557, after the last of Sangallo's work was torn down, the apse was fully vaulted, concluding the vaulting of the entire western portion of the church, with the exception of the central dome.⁶⁰ In the 1560s, while Philip II was reorganizing his Royal budget to begin El Escorial, work at the Roman Fabbrica was limited to the exterior, including the column capitals for the exterior of the dome's drum, cladding in the exterior of the apse, and the trabeation atop the dome drum, which was mostly finished in 1568.⁶¹ The chapel of San Michele, in the northwestern corner, which had begun in 1567, concluded in 1569. In 1570 excavation began for the foundations of the chapel of Santa Marta, the southwest corner chapel. In the following year, construction of the northeastern Gregorian chapel began.⁶² The 1570s saw much of the funding hitherto used in the Fabbrica diverted to military campaigns against the Ottomans. Nonetheless, in 1577, the Gregorian chapel was enclosed, and marble cladding began. The last chapel to be finished, the Clementine chapel was concluded in 1578.⁶³ Through the 1580s, the last details of the angular chapels came to conclusion, including exterior cladding and lanterns for the chapels immediately east of the dome. The dome drum trabeation was finished in 1588, and the Fabbrica was divided into two parts: one devoted to the dome, and one devoted to the lower story of the basilica.⁶⁴ In 1589 dome construction began, and the lead for its roof was ordered. Dome construction progressed relatively quickly, as the interior shell was finished, and the stairs between the interior and exterior shells were finished in 1591. Meanwhile, in the lower stories of the Fabbrica, the *tegurio* designed by Bramante to house the altar of the Old basilica is demolished in 1592, and the floor of the crossing is raised due to improper drainage of the foundations, creating the Vatican grottoes.⁶⁵ In 1598, the exterior marble cladding of the apse and transepts were finished, and the interior finishes for the dome began. At this point, at the turn of the 17th century, the square body of the church was finished, as was the dome, but the eastern

⁵⁸ Bellini 2001 75.

⁵⁹ Ibid. 77.

⁶⁰ Ibid. 75.

⁶¹ Ibid. 77, 78, 79.

⁶² Ibid. 81.

⁶³ Ibid. 83.

⁶⁴ Ibid.

⁶⁵ Ibid.

half of the older Constantinian basilica still remained, and the reigning pope Clement VIII ordered the restoration of its roof.⁶⁶ After this lull in which the pope pondered whether the Old basilica should come down or remain, Paul V declared its full demolition in 1605.⁶⁷ At this point, it had been decided that the church would have a Latin cross plan, and the nave extension was underway. In 1607 the northern nave aisle foundations were underway, and by 1612 the extended nave joined the new, Maderno-designed façade by way of a narthex.⁶⁸ It was not until 1615 that the 1538 dividing partition was demolished, and oval domes over the nave aisles were completed as well.

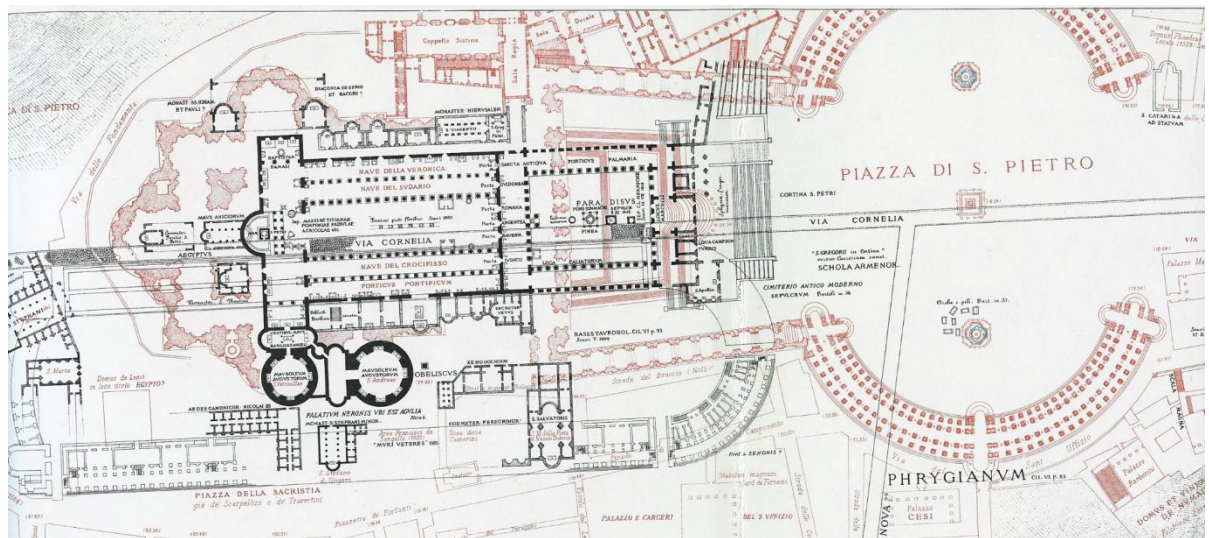


Figure 5. "Forma Urbis Romae," Plate XIII, detail showing the new basilica in red, the old basilica in black, and the Circus of Nero in gray, all superimposed. 1901, Rodolfo Lanciani. Drawing.

Examining the fluctuating progress of San Pietro and El Escorial side by side illustrates the overall direction in which works headed, occurring even with unfinished designs. San Pietro moved eastward from the west, trailing the demolition of the Old Basilica. El Escorial moved northward from the south, following the topography which required massive retaining walls and vigorous cutting of earth to achieve a level site. San Pietro underwent many design changes, which resulted in the demolition of work that had already been completed. Demolition of constructed work also took place at El Escorial, since the king consulted with architects external

⁶⁶ Marconi 2007 75.

⁶⁷ Ibid. 76.

⁶⁸ Ibid. 80.

to the Fábrica when the course of the work looked unsatisfying.⁶⁹ These occurrences are justified by construction which started while design was incomplete, or still fluctuating, which would be rare in modern times. Furthermore, this resulted in the flow of construction of both projects to seem very uneven. Instead of a uniform development from a fully laid-out site, volumes at San Pietro went up and became vaulted when other adjacent volumes were not yet started. Likewise, at El Escorial, the south towers were roofed, and the monastery was already inhabited while the piers of the basilica were still rising, and the foundations of the library had not even been dug. The effects of this rhythm of construction are evident and heavily documented in San Pietro: when construction halted due to political or economic circumstances, structural components designed to hold in a finished work were left standing alone. This often meant that the adjacent, necessary buttressing elements were not remotely feasible, and cracks developed on the built arches. It is unclear whether similar events took place at El Escorial, but the 1576 Hatfield engraving (see p. 16) showing the monastic complex under construction shows a finished exterior north façade that is not shored, which would be a colossal risk in present times. Furthermore, it appears that the façade wall is not built in its full length, which can lead to problems in joining the next portion to the finished wall. Nevertheless, the question remains, why the project of San Pietro, covering a smaller area, took nearly a century more to complete than a building twice its size, El Escorial, located in a remote location? It is incredibly significant that a 16th century construction of such dimensions was achieved so fast. Might it have been the singularity of the Habsburg leadership, as opposed to the elected pontiffs? Might it have been the extent to which Philip II ensured that workers would be fed and furnished with materials at the Spanish Fábrica? While laborers at El Escorial worked reasonable schedules, as we shall see, workers at the Roman Fabbrica were, at least at some point, working day and night, as evidenced by the purchase of candles during a time when the foundations of the Maderno façade were quickly filling with water.⁷⁰ These questions are not easily answered, as there are many factors that affected the productivity of workers in both El Escorial and Rome, particularly the organizational structure of each of the projects.

⁶⁹ Chías Navarro 2017 9.

⁷⁰ Marconi 2004 45.

The Workers

Organizational Structure at El Escorial

Administrative oversight at El Escorial shifted through its construction. For the first ten years of construction, government and administration of the Fábrica were carried out by the king until 1572, when he delegated to the Hieronymite prior. The architect and the Hieronymites were on the same rank under the king as the nobleman-led council of architecture that was appointed in 1563. The Hieronymite committee comprised of prior, accountant-treasurer, overseer, and paymaster, were not named ‘Congregación’ until 1569.⁷¹ The prior⁷² and his staff weekly reviewed the status of the project and the effectiveness of the workforce. Friar Antonio de Villacastín, though not a member of the Congregation, was appointed *obrero mayor*, or master workman⁷³ in 1562, and he oversaw the masters of quarrying, carpentry, and masonry (*aparejadores de cantería, carpintería, y mampostería*), as well as the keeper of materials and equipment (*tenedor de materiales*), for whom he stepped in several times.⁷⁴ Pedro de Tolosa and Lucas de Escalante, *aparejadores*, had lifetime appointments, answered to the *obrero mayor* of the Congregation, and supervised work by the hired contractors. The *aparejadores* also advised the Congregation on hiring contracted work by auctioned bid. Contracts were often awarded based on estimations provided by Juan Bautista, though the king preferred competitive bidding (*a destajo*). The Hieronymites, known for the austerity of their cult, oversaw the work of master builders and contractors in a time where profiteering from rigged bids was common in 16th century Spain.

The first architect brought direct experience of Rome to the project. Juan Bautista de Toledo was working under Michelangelo at San Pietro, until the king called for him to return to Spain in 1559. Giovanni Battista de Alfonsis, as he was known in Rome, was charged with directing all royal works in Toledo, Aranjuez, and el Pardo, all while making the first plans for

⁷¹ Kubler 1982 30, Congregation means both a board of overseers and an office for archival records (Kubler 32).

⁷² “Hieronymite houses elected their own prior, and at El Escorial the right to elect was [not allowed] until 40 friars were in the monastery” (Kubler 30), but the King continued to appoint priors until 1636. In 1587, the King persuaded fifth prior (in charge when the last stone was placed) to appoint the priors rather than elect them (Kubler 32) What benefits and disadvantages might this appointment system offer, compared to the somewhat democratic election of popes?

⁷³Ibid. 31.

⁷⁴Ibid. 34.

El Escorial.⁷⁵ Philip appointed him *maestro mayor* at the Fábrica in 1563 while he was still in charge of an addition to the royal hunting estate Casa de Campo and leveling a street in Madrid. The excess work, coupled with personal issues, kept him from meeting work schedules, which led the king to invite Francesco Paciotto to provide his opinion of the drawings. Philip also appointed a council of architecture composed of aristocrats, including the Marqués de Cortés,⁷⁶ who brought in wealth from America, the Conde de Chinchón, an ambassador to Spain, and the royal secretary Pedro de Hoyo. The members of the council of architecture had no architectural training, but would give their opinions on what Juan Bautista de Toledo had designed and what other architects, acting as consultants, had contributed. At the beginning of the works, Toledo argued with a master builder, Tolosa, and the King began to think about replacing him with Juan de Herrera, who was selected to assist Toledo in 1563.⁷⁷ The leading Spanish master builders of the time, when called upon in 1564, expressed concern with the progress of the southern retaining wall, the projected columns of the Basilica, and the refectory.⁷⁸ In the last years of his life, Juan Bautista was largely ignored by the king, who kept outsourcing to other consultants, and he was replaced after his death by Juan de Herrera.

The king issued several royal Instructions which amended the organization of the Fábrica. In 1565, due to insubordination of the builders he divided the Fábrica into zones. This way, the *aparejadores* would have closer supervision over their workers.⁷⁹ This was amended to in 1569 by the prior to prevent profiteering by the contractors. In 1572, Philip fully delegated authority to the Congregation, which newly included only the prior, overseer, and accountant. The *veedor* or overseer inspected all ranks of the Fábrica, stopping payments on bad work, and monitoring the conduct of the master builders and their foremen. The *contador* or accountant took over the role of the paymaster, keeping records of incomes and expenses, as well as contracts and estimates. The Congregation, the architect, and the master workman seemingly moved to the same rank with the instruction of 1572, in which the master workman rather than Juan de Herrera took charge of appointing and dismissing the master builders. Compared to the structure established in 1563, in which Juan Bautista appointed three *aparejadores*, the new one

⁷⁵Kubler 1982. 20.

⁷⁶ Son of Hernán Cortés, the conquistador. Ibid. 33.

⁷⁷Ibid. 30.

⁷⁸ Ibid. 21 “Rodrigo Gil de Hontañón, Hernando González de Lara, Enrique de Egas, and others”.

⁷⁹ Chías Navarro 2015 32.

simply doubled the *aparejador* dedicated to stonework and quarrying, alongside the original two for carpentry and brickwork.⁸⁰ Master builders were required by the king to make work drawings and wooden patterns for stonecutting at a building on site that was exclusively dedicated to drafting. They wrote contract specifications, and directed crews by delegating to *capataces*, who fulfilled the duties of foremen. The *aparejadores de cantería*, or master masons, placed daily orders to teamsters and carters to deliver material from the quarry. One friar was required to accompany a master mason to the quarry weekly to supervise deliveries.⁸¹ Conflicts were common between the master builders, especially master masons and contractors, and Pedro de Tolosa sometimes even challenged the master workman Villacastín. Much of this conflict was meant to be averted with the Instruction of 1572, which the *aparejadores* rejected, requiring further royal decrees in 1574 that would limit their power. The structure after 1572 quickly grew from four master builders to ten crews, each with its own master mason. The growing number of master builders quickly resulted in insubordination, strikes for increased pay and living quarters at the quarry, the dilution of responsibility, and the retention of payment from contractors. Thus, in 1576, Herrera named Juan de Mijares *aparejador único* (single master mason) in the *basílica* of the complex, a position he maintained until 1583. The authority of the other master masons was revoked, and for fulfilling the ten new sections of the *Fábrica*, twenty contractors were chosen after competitive bidding in 1576.⁸²

Below the *aparejadores* in the organizational structure were the *capataces*, or foremen. The first Instruction in 1563 paired foremen with a friar who would shadow their work and help them prepare a list of the workers under them, and compile the hours put into the project. With the restructuring of 1572, foremen took oaths to serve well, and were shuffled around from crew to crew. The workers' numbers had increased, many were idle, and they were often dismissed after the end of their contract. While the *aparejadores* were producing drawings and templates, the *capataces* would receive from them the lists of task assignments for the next day. Foremen, whether they worked at the quarry, the tile works, or the project site, were expected to mediate between *aparejadores* and workmen, leading their crews to ensure the master builder's tasks

⁸⁰ Kubler 1982 35.

⁸¹ *Ibid.*

⁸² *Ibid.* 37.

were completed properly.⁸³ At the lowest tiers of the hierarchy of the Fábrica were the workers, Peones (laborers), who worked for 11 hours a day in the summer, and 10 in the winter.

Work schedules in 16th century Spain typically ran from May to September, from sunrise to sunset with a break for meals. Most projects halted construction in the winter due to the weather and workers devoted this time to the prefabrication of materials. The construction of El Escorial marks an exception in that construction did not stop for the winter.⁸⁴ In fact, the construction schedule for the Monastery went on to affect future Royal Works.⁸⁵ Schedules varied at the Fábrica depending on the rank, as did the types of contract. From 1569, work began to be contracted on the basis of competitive bidding, with a set time and a set cost appraised by the Hieronymite monks.⁸⁶ Some laborers were still paid on an hourly basis, especially for tasks requiring large amounts of workers such as quarrying stone, cutting wood, or even toiling fields to feed the oxen that transported materials.⁸⁷ Work procured through competitive bidding was still subject to a specific daily working schedule, but the schedule did not affect the lump sum awarded, nor the speed of construction.⁸⁸ In the summer, laborers at the bottom tier of the organizational structure worked for 11 hours a day, while their superiors (*capataces*, *aparejadores*) worked for 10. Laborers would work between 6.30 and 11 in the morning, take a meal break until 1 in the afternoon, then resume work until 5 in the afternoon, eat dinner in half an hour, and finally work until sunset, more or less at 8 in the evening.⁸⁹ In the hot summer days, work would begin 1.5 hours earlier, with longer breaks in the middle of the day. In the winter, daily schedules were shortened by an hour for all ranks, starting at 7 in the morning and concluding at sunset, at roughly 6 in the afternoon. The Royal Instruction of 1572 unified schedules throughout the Fábrica, and throughout Spain, as Philip II took El Escorial as a model project for other Royal Works underway.⁹⁰

During the comparatively brief period of construction for El Escorial, Philip II amended the administration and organizational structural of its Fábrica through this Royal Instructions.

⁸³ Kubler 1982. 39.

⁸⁴ Cano de Gardoqui García 1998 45.

⁸⁵ Ibid.

⁸⁶ Ibid.

⁸⁷ Ibid. 47.

⁸⁸ Ibid.

⁸⁹ Ibid.

⁹⁰ Ibid. 49.

Thanks to the clarity of these documents and the brevity of the project, there exists scholarly research that can readily examine the effects of said Royal Instructions on the conditions of the workers and the organization of the Fábrica. In the case of San Pietro, however, records did not become consistent until 1529, and the academic material available for the remaining years is either too extensive for the purpose of this study or does not specifically delve into specifics such as work schedules. Fortunately, enough material is available to infer that the structural organization at the Roman Fabbrica did not differ greatly from its Spanish counterpart, though it did undergo significant developments as roles became institutionalized and codified, and as the leadership of the Fabbrica changed with each reigning pope.

Organizational Structure at San Pietro

At different building projects, *fabbriche* or *opere*, in Rome up until the 14th century, an architect would oversee *capomastri* (crew foremen who oversaw crews of *manovali*, laborers, or *muratori*, masonry workers) parallel to a *camerlengo*, who ensured that contractual terms were followed during construction and a *computista*, who addressed financial matters such as payments both to the workers and material suppliers.⁹¹ The Opera or Fabbrica at San Pietro was entirely led by members of the clergy, its internal structure that shifted as successive pontiffs began their mandates. The clerical body of administration, whose denomination and composition changed throughout the 16th century, was one tier above the architect. This was the bureaucratic composition of the Fabbrica which administered payments, ordered materials, and hired laborers. The first of such administrative bodies was appointed under the pontificate of Leo X, to manage the Fabbrica in a financial and legal sense.⁹² A cardinal appointed *commissario* headed the committee, assisted by 7 *soprastanti* and *misuratori* (superintendents/supervisors and measurers) who measured the completed work and skillfully estimated the cost of work. In the committee there was the architect, who took care of the sequence of operations at the Fabbrica, a banker who served as treasurer, and a merchant who managed supplying of material and deliveries, as well as relations between the workers within the Fabbrica. At this point, the cardinal-led administration had direct involvement on the project field. It was under Clement VII that a

⁹¹ Marconi 2004 26.

⁹² Ibid.

Collegium of cardinals was established in 1524 and it would last until 1605, when it was dissolved by Paul V. Clement VII created this administration a few years after Martin Luther had posted his theses, outraged in part by the cost of New San Pietro. The *Collegium* was also equipped with a team in charge of furnishing the Fabbrica with material, a function that affected both production and its delivery. During the pontificate of Paul III, in addition to the *Collegium*, three *deputati* (secular employees) spearheaded the leadership of the Fabbrica, but they were quickly replaced by a singular *Protettore* (a cardinal Patron). Shortly after, the archpriest of the Basilica became the key figure leading the Fabbrica, under the title of *Prefetto*, or prefect. This was done by Sisto V in the late 1580s to weaken the power of the Collegium, an effort that also manifested with an increase in the number of cardinals, which the pope hoped would reduce their income. The *Collegium*, initially a 50-person organization had grown through the 16th century into a committee of 70 cardinals, further enlarged by Sisto V with hopes that authority would be diluted, but probably making management of the construction site even more complicated. This is probably in conjunction with his reshuffling of the pontificate authority, as he dissolves committees and founds different cardinal congregations. The power of said congregations slowly weakened in favor of the different *Prefetti*, a position that maintained its power through the pontificate of Clement VIII.⁹³ After Paul V dissolved the *Collegium* at the bureaucratic leadership of the Fabbrica, he founded the Sacred Congregation of the Reverenda Fabbrica of San Pietro, composed of 10 cardinals and other prelates, among which remained the *Prefetto*, and archpriest of the basilica. This congregation engaged in monthly meetings with the so-called Little Congregation (composed of a bursar, a *computista*, an architect, a *fattore*, and a *soprastante*) for the purpose of payment justification and invoicing. The *soprastante*, architect, and often the bursar would vouch for the invoice, after which the *depositario* in the Fabbrica would fulfill the payment. Parallel to the many changes that the clerical administration of the Fabbrica underwent in the 16th century, the role that mediated between the cardinal organization and field laborers fluctuated depending on who fulfilled it, in one instance disappearing altogether.⁹⁴

Having understood the bureaucratic body of governance within the Reverenda Fabbrica, identifying how mediation to the workers on the field was realized is crucial to understand the

⁹³ Marconi 2004 27.

⁹⁴ Ibid.

enterprise's functioning. Nine years after the start of work at the new basilica, Pope Leo X appointed Giuliano Leni (socialite, entrepreneur, and merchant) as *curatore* of the Fabbrica in 1514. Leni became the first (and only) *curatore*, adding a tier between the architect and other operai and the ecclesiastical leadership, that garnished administrative, financial, and technical functions.⁹⁵ Leni had previously been a *soprastante* for Bramante. His relationship with Bramante is based on a "convergence of interests" between an entrepreneur attracted by the prospective profit from works around the city, and an architect in need for stable financing. His role as *curatore* had previously been fulfilled by the architect, and marked a first in its kind, with no antecedents nor successors. As *curatore*, Leni carried out functions such as coordinating operations with *capomastri*, administering payments, and all practical or technical issues of the worksite.⁹⁶ The notarial documentation for Giuliano Leni's role from 1517 and 1530 coincides with the sparsely recorded first years of the Fabbrica, which indicates that his records filled an important gap. This documentation encompasses a series of contracts between Leni and skilled workers for wall-building, chiseling, and digging. Among the documents is a contract for the construction of a massive foundation, for which Leni would furnish materials and quarrymen, while another individual, "*magister Dominicus lombardus muratore*" (master Dominicus, Lombardian *muratore*), guaranteed the continuous labor of 30 men and 3 carts.⁹⁷ Another contract from 1521 entrusts Leni with the construction of 12 columns with their capitals and two travertine pilasters for the North transept. The contract stipulates the required time frame, and a sum of 1,000 ducats per month.⁹⁸ This suggests that perhaps, unless a standardization of the procurement of work took place, individual contracts existed for each component of the building. Contracts featured abundant graphic explanations, and their format, which stipulated lump sum costs and durations, was very similar to the type of contracts that were awarded by competitive bidding at El Escorial. Leni's close relationship with the pope suggests that the non-clerical leadership of the Fabbrica was influenced by each pontificate, as if the owner's representative for the project switched alongside the popes, who might have favored not only different architects, and decidedly favored different organizational structures and different patrons. Leni continued to work even through the Sack of Rome in 1527, but died in 1530, leaving his position of power

⁹⁵ Marconi 2004 26.

⁹⁶ Vaquero Piñeiro 1995 157.

⁹⁷ Ibid. 158.

⁹⁸ Ibid.

over the Fabbrica to be disputed between *deputati* and the architects. This in turn limited the role of material suppliers and procurers of labor by leaving them out of the decision process for the project, where they had been more integrated under Leni's multidisciplinary leadership.⁹⁹

The role of *curatore*, which encompassed furnishing materials, contracting work, and heading the administration of the project site, has been delineated by scholars because of its multidisciplinary nature. Another individual with a multifaceted role was Pietro Paolo Drei. Drei was the descendant of a lineage of *muratori*, *fattori*, and *soprastanti* who climbed the ranks of the Fabbrica in the 17th century. The Drei family resided in the Vatican Borgo, and though technically they were under the mandate of the architect, they devoted their lives to the Fabbrica and that was their first allegiance.¹⁰⁰ Pietro Paolo Drei, in the role of *soprastante*, worked closely with the architect, and communicated the design to the laborers on the field through enlarged, construction detail-like sketches. He fulfilled additional duties characteristic of a *soprastante*, such as supervising material quality and deliveries, executing the orders of both the architect and the congregation, and as a result his hand is present in countless drawn details and ledgers from the time of his involvement.¹⁰¹ It seems that during the development of the Fabbrica from the construction site of New San Pietro into a Vatican-operated construction company that worked throughout Rome, the employment of factotums was highly beneficial. Leni's role was akin to that of a general contractor, project manager, and owner's representative. Drei's role overlapped the functions of designer, engineer, and project superintendent.

As far as the hierarchy beneath the ecclesiastical administration and its mediators, the roles of builders were not too different from those at El Escorial. Certain roles remained more or less consistent throughout the many administrations of the Roman Fabbrica. The *soprastante*, who answered to the Congregation, worked alongside the architect in supervising, estimating, and appraising completed and pending work. The function that the *soprastanti* fulfilled was like that fulfilled by the *aparejadores* at El Escorial, except that the *aparejadores* worked directly beneath the architect. Often, the *soprastante* is referred to as 'second architect,' suggesting a role that both oversees construction, but also has input on design decisions.¹⁰² The role of *aparejador*

⁹⁹ Vaquero Piñeiro 1995 159.

¹⁰⁰ McPhee 2008 356.

¹⁰¹ Ibid. 358.

¹⁰² Bellini 2001 74.

is still codified in present-day Spain, differentiated from *arquitecto* in that the former includes a technical component. “Aparejar” in Spanish means to carry out all necessary duties in preparation for executing an activity. The role of *soprastante* in Italy has mutated to become codified as *direttore dei lavori* (director of works), similar to a project manager. *Computisti* accounted for completed work, carried out periodic inspections of the site, and compiled the measures and estimates done by the *soprastanti* for financial administration. For San Pietro, the *fattore generale*, or *monizioniere* was a key figure. He managed the project site, established the roles of workers, took attendance of workers, supervised their work, and was the only one in charge for materials and other general supplies. His functions are analogous with those carried out by the *obrero mayor*, or master workman at El Escorial, except that at El Escorial the role was fulfilled by a single friar who was unaffiliated with the Hieronymite Order. The *obrero mayor* mediated between the Hieronymite Congregation and the *aparejadores* and their employees, in a sense not far from Giuliano Leni’s mediation role, with the exception that the *obrero mayor* Fray Antonio de Villacastín worked at El Escorial from start to end. *Capomastri* were crew foremen, whose functions were like those carried out by *capataces* in Spain. It is notable that the role of the architect at San Pietro might seem to have been minimized in this analysis. This is not only due to an effort to focus on the builders, but also because information on the architects at the Roman Fabbrica is so extensive; their influence must have been significant, especially in convincing the pope or cardinal committee that rework was necessary on account of design changes. It is also noteworthy that the roles and organizational structures in Rome and El Escorial were both in flux, especially the growing prominence of the role of the architect.

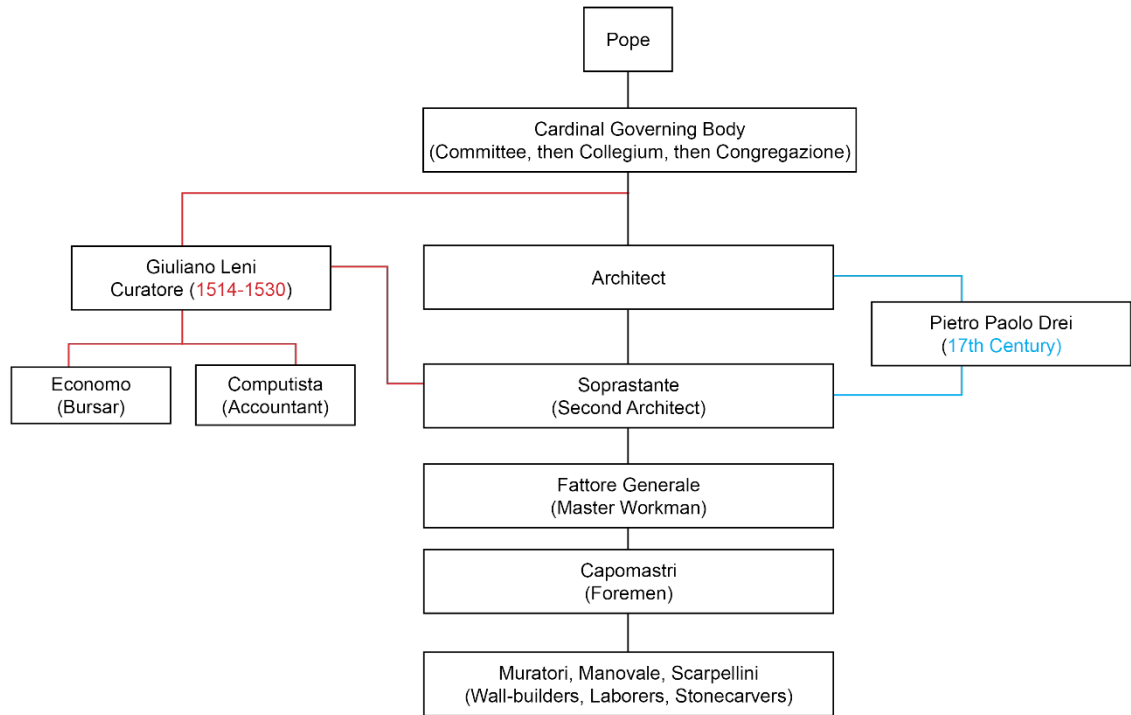


Figure 6. San Pietro: Approximate Organizational Structure through the 16th century.

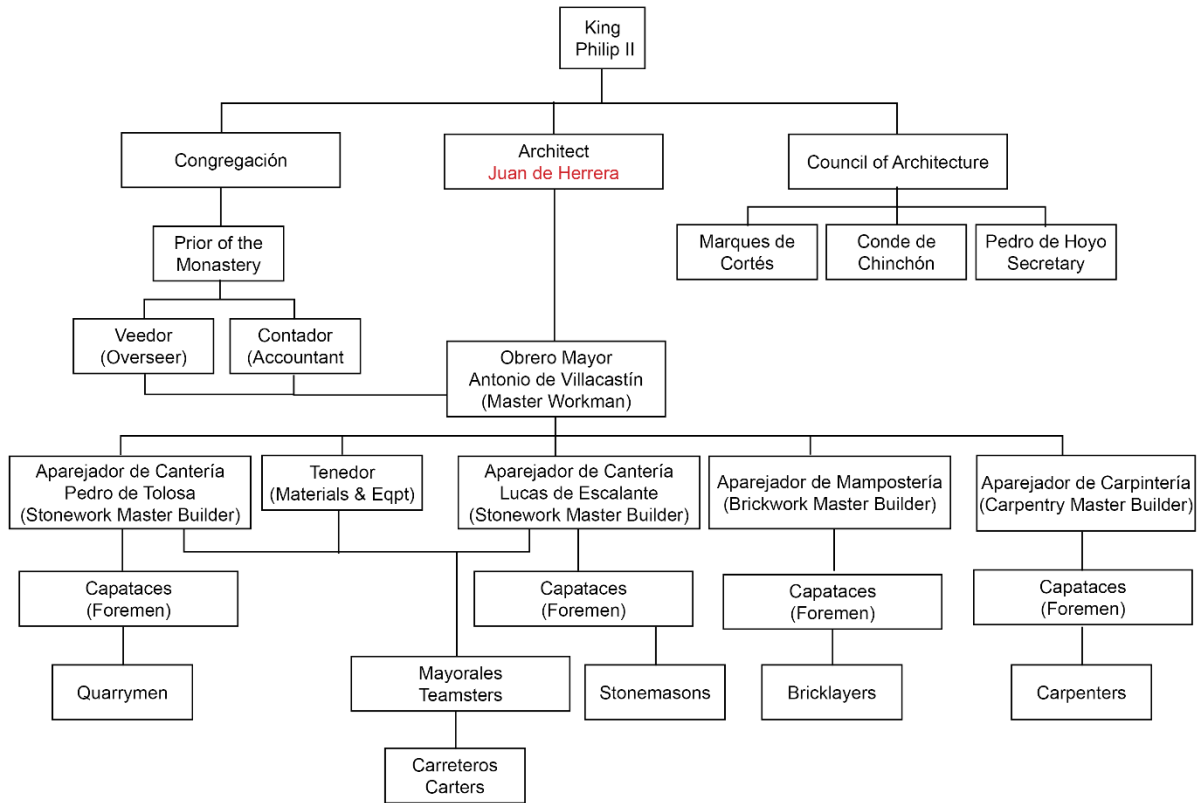


Figure 8. El Escorial: Organizational Structure from 1563

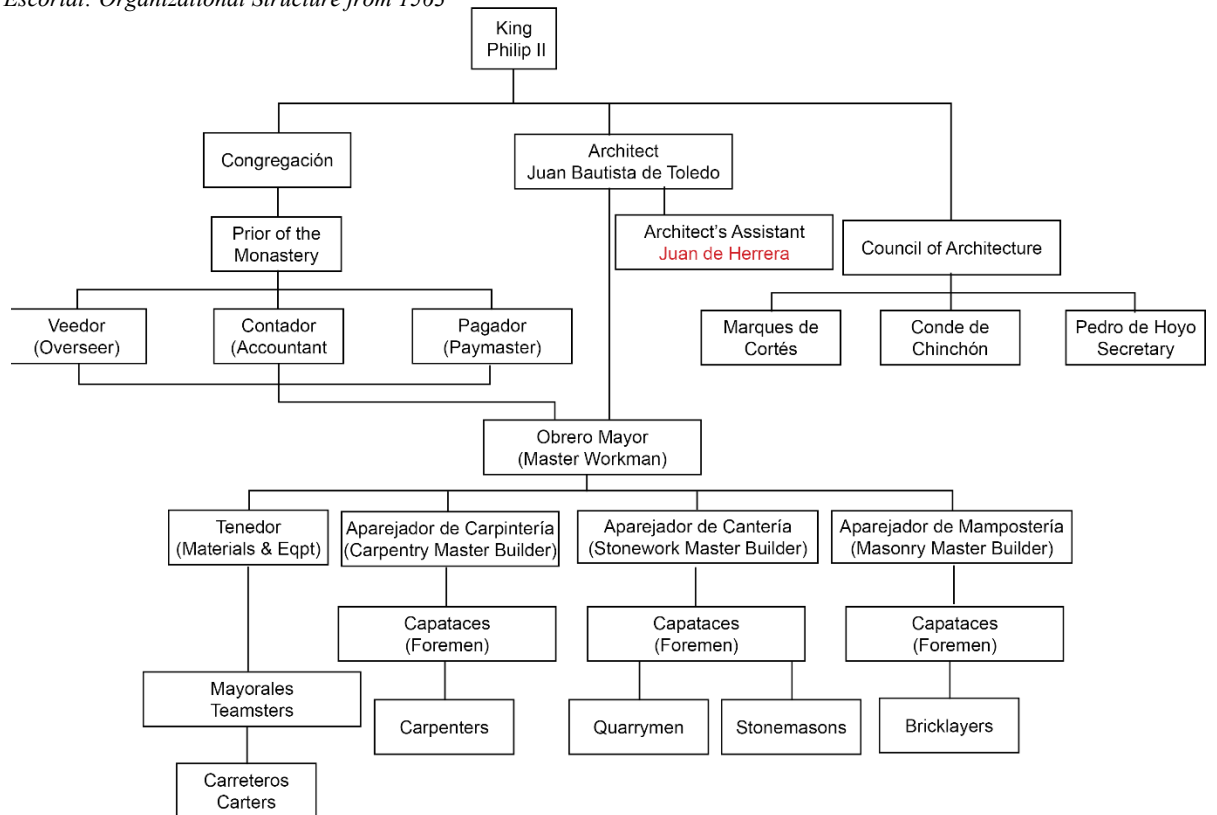


Figure 7. El Escorial: Organizational Structure from 1572

Conclusions

Having taken a comparative look at the Reverenda Fabbrica and the Real Fábrica, it would be useful to contextualize their operations through comparison to modern day construction. The Roman Fabbrica faced challenges that the Spanish Fábrica did not share. Construction began under the order of one pope whose vision did not exactly align with his successors. When demolition did begin on the old basilica, the design of the new one was not complete, and it would still undergo several changes even after being partly materialized in some instances. The soil conditions of that particular sector of the Tiber River shore would be the cause of much grief to architects and builders alike, not to mention how notoriously complex it is to build in Rome, where ancient ruins are more than likely beneath one's feet, as was the case with the Circus of Nero beneath San Pietro. Construction on the basilica continued through a historical Sack on the city and many wars fought in the name of God. The political circumstances in the city, and especially the allegiance and influences of the reigning pope often slashed the budget of the Fabbrica, often stopping construction. The ephemeral nature of the pontificate instilled much doubt in the popes whose differing visions seemed far from completion, knowing that their predecessors also might not live to see the basilica to completion. To make matters worse, disagreements between successive popes lead to the creation of bureaucratic bodies designed for their own peril, probably making accomplishing anything seem virtually impossible. This, coupled with the ever-changing design and unstable political context arguably might have resulted in a sort of piecemeal construction where entire sections of the building were erected and vaulted while their adjacent components were barely crowning over the foundation trench. Construction professionals were working from contract drawings that were not finished, and subject to change. In fact, drafting of construction details might have been taking place very regularly in the evenings, in preparation for the following day's work. Contract procurement reflected this instability, as *soprastanti* and *misuratori* were often on the field, looking at foundation walls and estimating their cost after the fact, executing small contract after small contract dedicated to separate components of the final product. Project delivery, in a sense, was carried out by way of what today would be called multi-prime contracting, which procures a prime general contractor, and trade contractors for specific trades, as opposed to a single contract with subcontracted craftsmen. There is no doubt that construction in the 16th century took more

strength, people, and years than today. It so happened that New San Pietro coincided with many other circumstances that may have been unfavorable to its century-long construction.

While the Roman Fabbrica struggled with the central position of its site, bearing the effects of overlapping circumstances, it seems that the Spanish Fábrica benefited from its removed location and centralized leadership. Philip II was known as “the Prudent.” He did participate in numerous military campaigns, but he often delegated their oversight while he remained in his Alcázar in Madrid. From there, he could purchase and rearrange Crown properties with the goal of furnishing his upcoming Monastery. Mills and farms were dedicated to the functioning of the El Escorial site, and its village. The king’s headstrong determination (and Divine Right) allowed him to move heaven and earth to establish a Fábrica where workers enjoyed tax exemptions on their salaries, as well as free healthcare and lodging. Granted, such efforts were probably not necessary in the middle of the city of Rome, where workers might have been able to reside in their own homes. El Escorial was not free of design changes nor obstacles to construction. Philip II financed the construction of a complex now known for its austerity with the money of Spanish taxpayers and seized colonial riches. The king’s hurry to see this impressive complex to completion caused him to pressure his Royal Architect to the point of dispensing with his designs to a certain extent. Construction had already begun with parts of the complex still undrafted, and Juan Bautista was often engaged in disputes with workmen and master builders at the site. Though the general footprint of the complex had been defined since the beginning, nearly every night the *aparejadores* would retire to the drafting facility to prepare details for the next day of work, similar to what Pietro Paolo Drei would do at the Roman Fabbrica. Contract procurement for El Escorial was just as granulated as in San Pietro, with small portions of the construction awarded by bid. In a similar sense as with the Roman Fabbrica, the monarch was not able to disburse large lump sums of money to the builders for significant portions of the work, having to distribute small sums of money here and there as different parts came to completion. It was not just the monarch’s urge to see his vision realized, but also that of the monks of the Hieronymite Order to inhabit their new monastery. The king’s power, and haste to complete El Escorial, might have contributed to its quick completion, taking nearly a century less than the Roman Fabbrica to conclude New San Pietro, for a project that is twice the basilica’s size. Nonetheless, the phenomenon of piecemeal construction is not exclusive to the papal basilica. The Hieronymite Order moved into the monastery in 1571,

merely nine years after the works started. By then, one half of the monastery was finished, while its northern half and its basilica were still well underway.

As at San Pietro, at El Escorial there were built components that were torn down due to design changes, and other structural components were left standing alone without temporary shoring or bracing, which might have incurred damage to the final construction. A big player in explaining this is the project delivery method for each building: a sort of multi-prime contracting in which contracts were awarded on specific parts of the final product. The more universal contractual drawings showing the entire project were not binding, since the design was still subject to change, and it did on many occasions. The small scope contracts at both sites included a narrative detailing amounts of materials, or lengths of wall, especially for simpler parts of the buildings. Likely, scopes of work involving vaults and, especially, domes involved more consolidated work procurement, as opposed to small-scope contracts. In any case, this narrative was often supplemented by a sketch on the backside of the contract.¹⁰³ The brevity of these prime contracts might be explained with an assumption of the contracted builder's knowledge, and the fact that its narrative and sketch would in turn have been supplemented with verbal instructions from the *obrero mayor*, the *fattore generale*, a *soprastante*, or an *aparejador*. While those ephemeral verbal communications are now lost, we nevertheless have enough documentation to reconstruct the organizational structures at both sites.

¹⁰³ Chías Navarro 2017 8.

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