

RESTORATION OF THE MONUMENT: REFLECTION ON THE PLANIMETRIES OF THE ALHAMBRA

LA RECUPERACIÓN DEL MONUMENTO: REFLEXIÓN SOBRE LAS PLANIMETRÍAS DE LA ALHAMBRA

ANTONIO ALMAGRO GORBEA

ROYAL ACADEMY OF FINE ARTS OF SAN FERNANDO

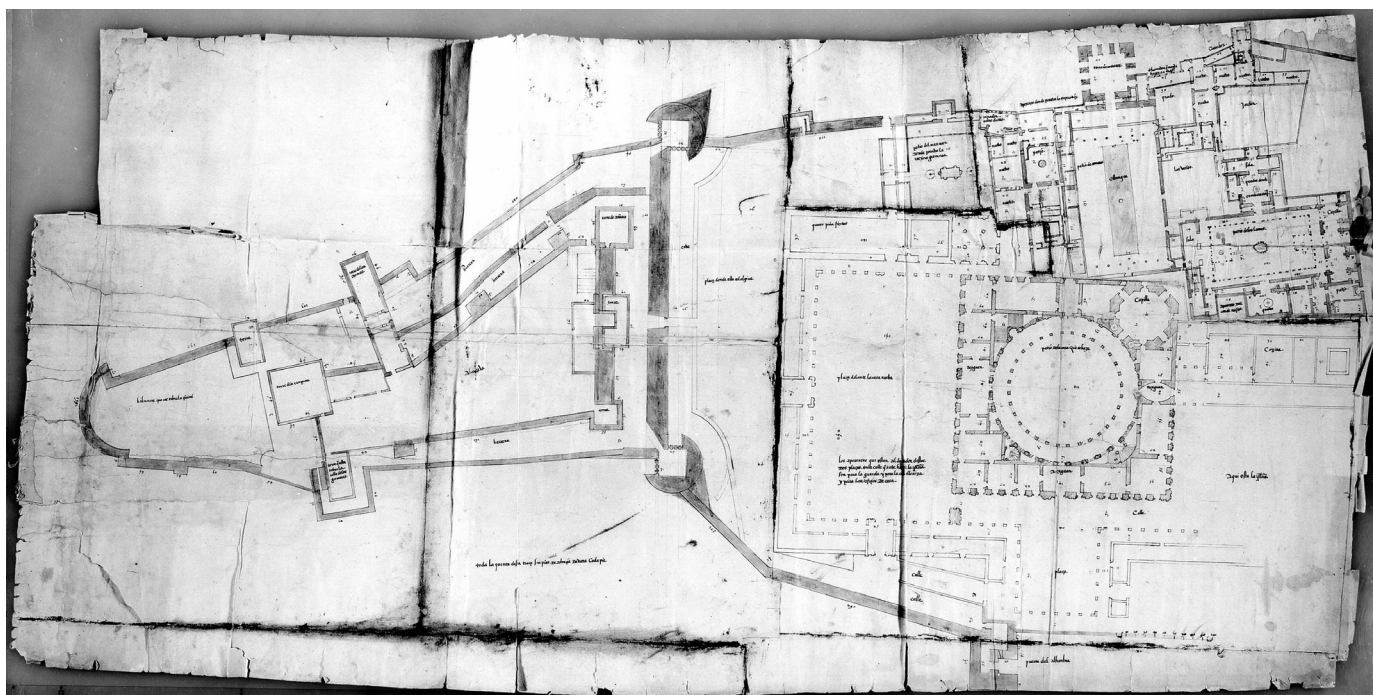
analgo48@gmail.com

ABSTRACT: when commemorating the 150th anniversary of the inscription of the Alhambra as a National Monument, it is also worth remembering the more than 250 years since the beginning of its graphic documentation as a cultural heritage. The extensive collection of plans and drawings of the monumental site that we have today constitute exceptional documentation to analyze its transformations and the criteria with which it has been intervened. Since the Royal Academy of Fine Arts of San Fernando started the first planimetry works in the 18th century with the aim of facilitating and disseminating its knowledge and guaranteeing its best conservation, the numerous recording works carried out are a faithful reflection of the forms of understand the Alhambra and approach its conservation.

KEYWORDS: documentation, graphical survey, photogrammetry, plans **RESUMEN:** al conmemorar los 150 años de la declaración de la Alhambra como Monumento Nacional merece recordarse igualmente los más de 250 años del inicio de su documentación gráfica como bien patrimonial. La extensa colección de planos y dibujos del conjunto monumental de que hoy disponemos constituyen una documentación excepcional para analizar sus transformaciones y los criterios con que se ha intervenido en él. Desde que en el siglo XVIII la Real Academia de Bellas Artes de San Fernando iniciara los primeros trabajos de planimetría con el objetivo de facilitar y difundir su conocimiento y garantizar su mejor conservación, los numerosos trabajos de documentación realizados son un fiel reflejo de las formas de entender la Alhambra y de abordar su conservación.

PALABRAS CLAVES: documentación, levantamiento gráfico, fotogrametría, planos

CÓMO CITAR / HOW TO CITE: ALMAGRO GORBEA, A. La recuperación del monumento: reflexión sobre las planimetrías de la Alhambra, *Cuaderno de la Alhambra*. 2020, 49, págs. 237-257. ISN 0590-1987



IL. 1. Pedro de Machuca (attrib). Plan of the Royal House and the Alcazaba of the Alhambra with the project of the new palace. Royal Palace Library, Madrid.

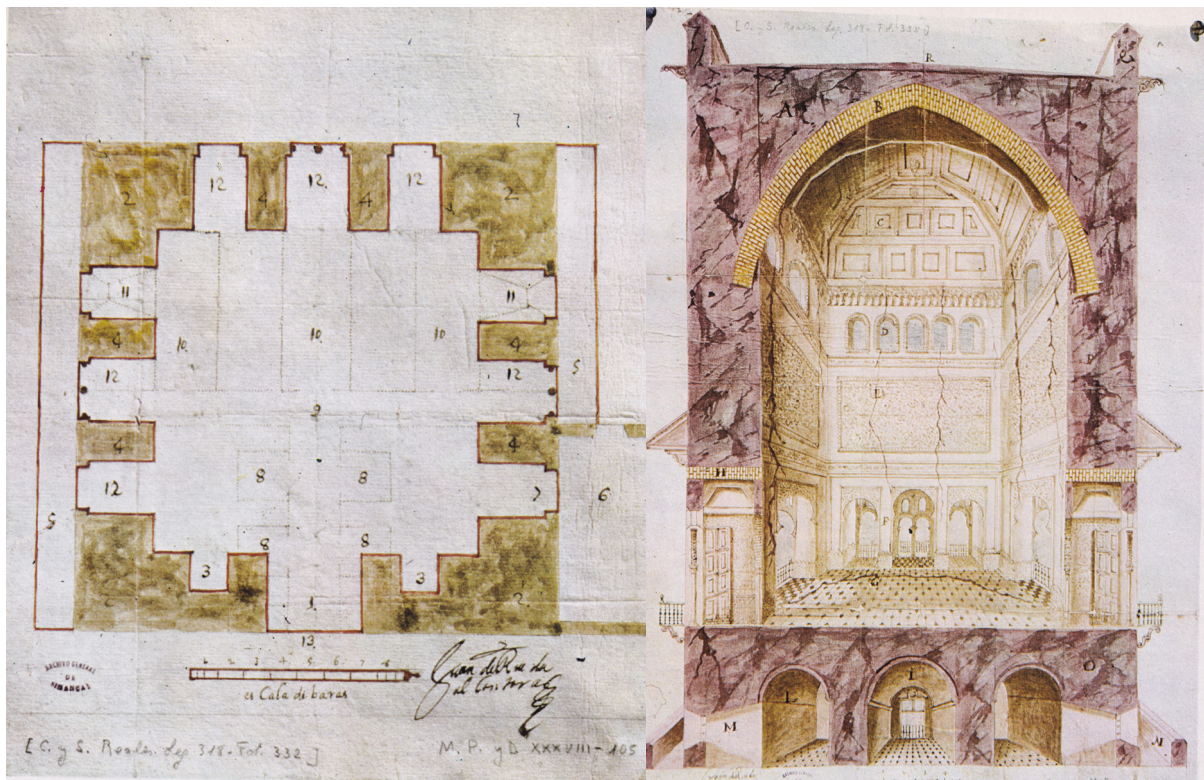
The graphic documents of the Alhambra in Granada that have been produced over time, especially the planimetries of the complex, have played an important role in its protection and conservation and are at the same time an interesting indicator of the way in which these tasks have been carried out.

The commemoration of the 150th anniversary of the establishment of legal protection for the Alhambra is undoubtedly an appropriate moment to reflect on the various protection mechanisms that have been used. The declaration of the Alhambra as a National Monument was made by Order of the Regency of the Kingdom on 10 February 1870. The Order was a consequence of the law that provided for the dissociation and sale of the assets that had belonged to the Crown, and which established that those of a historical or artistic nature were exempt from such sale¹, thus establishing a State protectorate for these assets, assuming their ownership and conservation.

Although this is the origin of legal protection in response to a modern concept of heritage conservation, the Alhambra has always been given special

care thanks to its status as royal property, firstly of the Nasrid sultans, its builders and first inhabitants, and later of the monarchs of the various dynasties that reigned in Spain, who effectively ensured the conservation of their heritage at all times. It is clear that such protection was always in keeping with the vision of each period and with the importance of the property for those responsible for them. Both in its origins and during the 16th and 17th centuries, the Alhambra was considered the property of the monarchs and was therefore subject to their will and tastes. This can be seen clearly in the first technical plan we have available, attributed to Pedro de Machuca and preserved in the Library of the Ro-

1. Law of 18 December 1869, "declaring the Crown Estate extinct, returning to the State full possession of its assets and rights and those of the Royal House, and arranging for their disposal, with the exceptions given". Art. 2. 2 exempts from such disposal "Those which by reason of their historical or artistic nature must be preserved".



IL. 2. Juan de Rueda Alcántara. Drawings of the Tower of Comares (1686). General Archive of Simancas.

yal Palace in Madrid. The so-called «large plan»² of the group of drawings made for the construction of the Palace of Charles V in the Alhambra enclosure shows us the insertion of the new building and its relationship with the Nasrid Royal Quarter and the Alcazaba (Il. 1). Although the information it provides is of great value, it is clear that the reason for this drawing was not the protection of the monument, but rather its transformation according to the wishes of the Emperor and his collaborators.

If we disregard the very generic and imprecise Platform by Ambrosio de Vico, the following drawings are those made in 1686 by the master Juan de Rueda Alcántara for the consolidation works of the Comares tower³. The drawings show little technical expertise in how to represent architecture, still far from the standardization that was to be imposed by Descriptive Geometry in the next century, but they are particularly expressive and are undoubtedly of great interest (Il. 2). They are plans that illustrate a report on the state of the tower, and in that sense they contain very useful information despite the

fact that the building as heritage is not considered in a modern sense and its metric quality is insufficient.

During the 16th and 17th centuries, those responsible for the conservation of the monument were the governors of the fortress, all belonging to the family of the Duke and Duchess of Tendilla⁴. The political upheavals that put an end to the perpetual nature of the governorship led to other more scientific, modern actions within the enlightened spirit character-

2. ROSENTHAL, E.E. *El palacio de Carlos V en Granada*. Madrid: Alianza, 1988. p. 23

3. CASARES LÓPEZ, M. Documentos sobre la Torre de Comares (1686). *Cuadernos de la Alhambra* 9 (1973), p. 53-66.

4. LÓPEZ GUZMÁN, R. (coord.) *Los Tendilla, señores de la Alhambra*, Granada: Patronato de la Alhambra y Generalife, 2016.

ristic of the 18th century. They include in particular the actions taken by the new institutions created by the Crown, such as those of the Royal Academy of Fine Arts of San Fernando, which, upon learning of the deterioration suffered by the Alhambra, undertook an exemplary and innovative project that we can consider corresponds absolutely to the modern age: documenting the monument as the most effective means of guaranteeing its conservation.

In view of the news of the precarious state of the existing paintings in the Hall of the Kings and the consequent danger such a situation entailed, as it could lead to their disappearance, the Academy became interested in making copies of them not only to preserve their memory but also to promote their dissemination in Spain and the rest of Europe, with the added objective of increasing the international prestige of the nation. For this reason, in the meeting of 14 October 1756, Ignacio de Hermosilla, secretary of the corporation, in keeping with the Academy's plan to «conserve and propagate the news of our Antiquities and Monuments», proposed to commission a local painter, a student of the Academy, to copy the portraits of the Moorish kings on the ceilings of the Hall of the Kings in the Court of the Lions of the Alhambra. As, four years later, nothing had been done, the Academy, through Luis Bucareli, then Governor of the Alhambra, passed on the assignment to the Painting and Architecture teacher, Diego Sánchez Sarabia⁵. At the end of 1760, Sarabia sent three oil paintings of the portraits and figures of the Hall of the Kings and three drawings of inscriptions, together with a report. In view of these materials, the Academy decided to send him instructions that expanded on the initial commission, asking him not only to rigorously copy the inscriptions and paintings on the vaults, but also to draw up plans for the palaces of the Alhambra, including the one built in Arab times with its later reforms and the one ordered by Charles V. The purpose of the commission was undoubtedly to recover information of archaeological interest to learn more about the history involved. Between 1761 and 1762 Sarabia sent the Royal Academy of San Fernando another three oil paintings from the Hall of the Kings, as well as a series of plans, elevations and drawings of decorative motifs on floors and friezes, architectural elements, ceramics and

inscriptions from the Nasrid palace and the palace of Charles V.

For this purpose, the Academy used one of the instruments it recommended and taught: drawing. This means of expression is common to the so-called «three noble arts»: architecture, painting and sculpture; but it is undoubtedly the instrument par excellence of the professional practice of architects. Not only is it the means by which they express their ideas before they materialize, but it is also an essential tool for studying what has already been built. Within the different graphic forms of representation of architecture, planimetric representation has been of greater use thanks to its particularities. Representation through the laws of descriptive geometry defined by Gaspar Monge in the 18th century continues to be the most direct and intuitive system for understanding the reality of an architectural work. Such representations give us an objective view of the forms and dimensions of what is represented. The application of drawing as a method of analysis and therefore of knowledge to architectural heritage is consequently clear and unavoidable. If we want to preserve a piece of heritage, we must first know what aspects of it we have to preserve in terms of materiality and concept. Thus, drawing, as an exercise in research and expression of our knowledge, is essential and unique.

The precedent of the project by the Academy of San Fernando should be sought in studies on monumental and vernacular architecture carried out in different European countries as from the beginning of the 18th century, but in the tradition of analysing classical architecture as a source of knowledge and inspiration for architects, which in this case was transferred to Islamic architecture as a new field of study. These ideas were already present among

5. RODRÍGUEZ RUIZ, D. *José de Hermosilla y las Antigüedades Árabes de España: los orígenes del proyecto*. Espacio, Tiempo y Forma (Serie VII, Historia del Arte), 1, 3, 1990, pág. 226. RODRÍGUEZ RUIZ, D. *La memoria frágil. José de Hermosilla y las Antigüedades Árabes de España*. Madrid, 1992, p. 35

the architects of the Renaissance who examined the architecture of the ancient world using drawing as the main medium for the study of form and proportion. The idea and method are reflected in the Instruction received by the architecture students of the Royal Academy of San Fernando who went to Rome:

«Ancient ruins are not merely to be seen and drawn: they must be studied in a serious, discerning manner because the excellence of most ancient things hangs on the fact that their authors worked more with their reasoning than with their hands, as opposed to their modern counterparts. Ruins are to be measured, their perfections and defects speculated upon, and the precautions and traces of their construction ascertained»⁶.

Undoubtedly, the spirit of these instructions had been followed by two of the main architects of this academic work, José de Hermosilla⁷ and Juan de Villanueva⁸, during their stays as students at the Academy in Italy.

These experiences and teachings have been kept alive in almost every period. However, in the Age of Enlightenment they were applied, for the first time, to the architecture of another culture different from the Classic Greece or Rome, more precisely, in the Alhambra. At the height of the Neoclassical period, the Academy, which promoted the trips of its most outstanding students to Rome and Italy to study classical architecture, had to face the problem of preserving a new and exclusive artistic legacy of Spain on the European stage. To this end, the Academics applied the same method: drawing the architecture and decorations as a way of learning about and preserving it and spreading its existence as part of the nation's heritage.

Although the initial project planned by the Academy and commissioned to Sánchez Sarabia was only to document these antiquities, in view of the interest aroused by the work carried out and the satisfaction of the corporation with the material received, the decision was taken in 1762 that it would be published and consideration was given to extending the procedure to other monuments in the country.

In 1766 Charles III agreed to the Academy printing the drawings, although the publication of the *Antigüedades Árabes de España* (*Arab Antiquities of Spain*) was still delayed for a few years, the volume with the architectural drawings finally appearing in 1787; the second volume with the inscriptions and ornamental motifs was not printed until 1804. This work was fundamental in making the Alhambra known in the cultured world of Europe and was undoubtedly the seed for numerous publications in the following century.

Six canvases and forty-three drawings of Sánchez Sarabia's paintings and designs are kept at the Academy⁹. The paintings correspond to the first commission he received to copy the paintings on the vaults of the three alcoves of the Hall of the Kings in the Court of the Lions. They constitute a work whose value is more historical and testimonial than artistic, since neither the technical quality of the painting nor the fidelity with regard to the original are worthy of special note. From a modern-day point of view, they can be said to be more an interpretation by the artist than an exact copy. Nevertheless, they stand as a memorable attempt to document these very interesting medieval works, which, owing to the characteristics of the painting technique and medium, have always involved serious conservation problems.

The architectural plans made by Sánchez Sarabia were eventually criticised and finally discarded when José de Hermosilla was able to compare them

6. Cited in RODRÍGUEZ RUIZ, D. (1992). *Op. cit.*, p. 17.

7. SAMBRICIO, C. José de Hermosilla y el ideal historicista en la arquitectura de la Ilustración. *Goya, Revista de Arte* 159 (1980), p. 143.

8. CHUECA, F. Y DE MIGUEL, C. *La vida y las obras del arquitecto Juan de Villanueva*. Madrid: Escuela Técnica Superior de Arquitectura de Madrid, 2012. p. 61-92.

9. ALMAGRO GORBEA, A. (Ed.) *El legado de al-Andalus. Las antigüedades árabes en los dibujos de la Academia*. Granada: Patronato de la Alhambra y Generalife, Real Academia de Bellas Artes de San Fernando, 2016.

with the actual architecture. We know that he finally used them as working sketches to note down measurements, thinking that they were of no use for anything else, as he makes known in his correspondence: «because neither the small nor the big plans or outlines are useful for anything other than to jot down the numbers in pencil and even then only the plans because the elevations show not one line in its place»¹⁰.

Without a doubt, the most valuable part of what the artist from Granada did included the copies of ornamental elements, especially tiling, inscriptions, decorative details, etc. As the Academy had not initially considered publishing this graphic material, Sánchez Sarabia had to consider creating a collection of drawings to be kept as an album to learn about the decorative forms and all their parts, including the original bright colours and which needed to be kept in a better state than they are today. Unfortunately, when it was decided to make the edition, it could not be made in colour as there were no technical means to do so at that time, but there is no doubt that the way in which all those drawings were made clearly shows an interest, which we must consider novel, in valuing the importance of the use of colour in that architecture, thus anticipating the ideas of later scholars, such as Owen Jones, by more than seventy years¹¹.

The criticisms and doubts raised about the work carried out by Sánchez Sarabia with regard to the plans for the palaces finally led to an agreement to commission the review, correction and completion of this work to the captain of the engineers, architect and honorary academic, José de Hermosilla y Sandoval, assisted by the architects Juan de Villanueva, who had recently arrived from his six-year stay as a student in Rome, and Juan Pedro Arnal. Accordingly, the Academy assumed the project successfully with one of its most prestigious members and two of its most outstanding students. The three architects travelled to Granada for the project in the autumn of 1764.

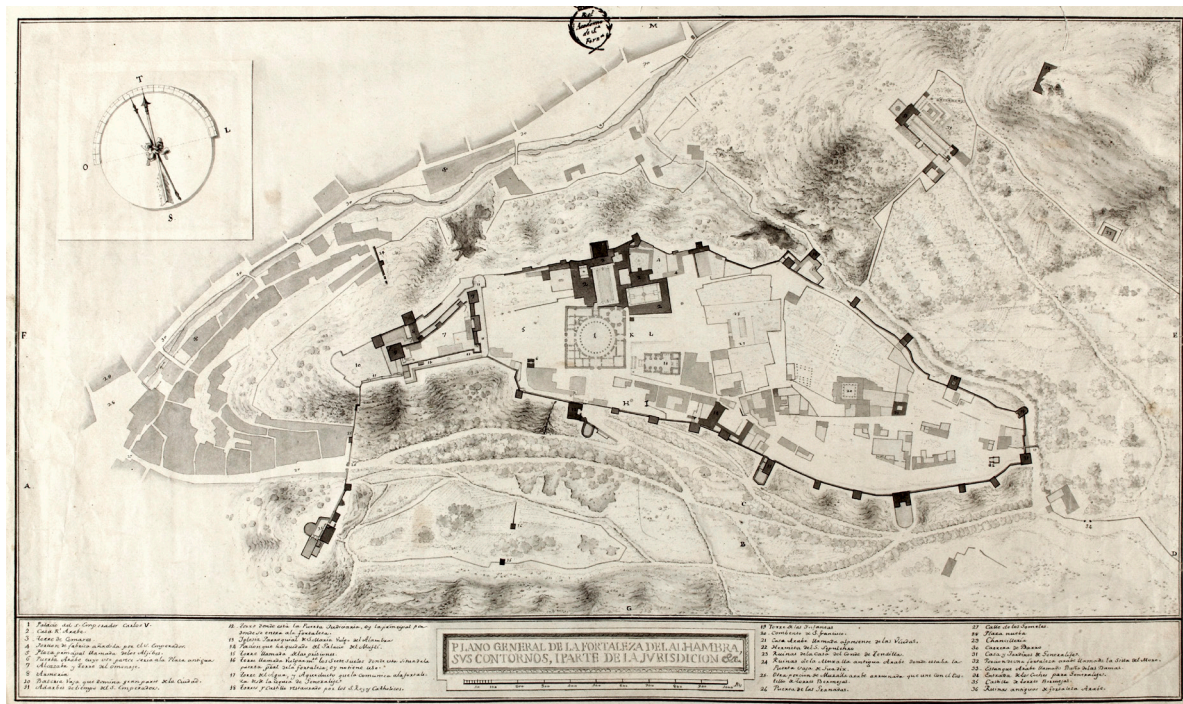
The collection of drawings made by this team of academic architects stands out for its graphic quality and detail. It is clear that they are not commitment drawings, but rather analyse the whole and

each part of the building. The most outstanding is the general layout of the fortress, which has very good graphics and marked precision taking into account the technical resources available (Il. 3). The use of the plane table, an instrument to which Hermosilla must have been accustomed, enabled the creation of a remarkably accurate plan regarding the location of the main elements of the complex, especially the perimeter of the walls. Even in the overall dimensions, special mention must be made of the remarkable accuracy of the measurements. We therefore have a reliable and sufficiently accurate plan that can be trusted entirely because none of it is free or improvised. It is therefore of great documentary value as it includes elements that have now disappeared, especially after the demolition of the southern wall by Napoleon's troops when they withdrew from the city. In this entire area of the east end of the wall, it is worth mentioning that the towers were raised above the *chemins de ronde* of the adjoining walls, which today are much smaller, as well as the presence of several towers that have now disappeared. This general planimetry of the complex carried out by José de Hermosilla is by far the best documentation until very recent times, and can be considered highly reliable and remarkably precise. It is the result of conscientious work, good technique and, above all, a scientific spirit that sees the architecture of the past as a historical source worthy of being preserved and studied.

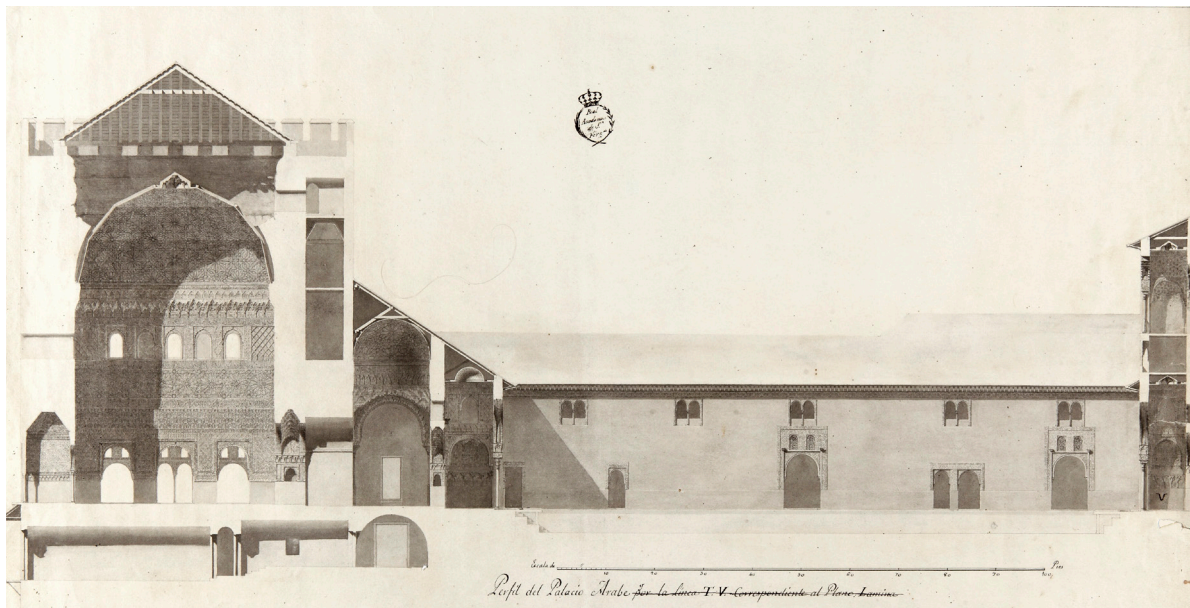
The plan of the Royal House drawn in this project lacks the quality and precision of the general plan. Even if the dimensions of the different rooms are correct, there is a tendency to regularize the structures and overlook the small deformations, which leads to an accumulation of errors that finally beco-

10. Letter to Ignacio Hermosilla dated 7 November 1766, Archives of the Real Academia de Bellas Artes of San Fernando, sig. 1-37-1.

11. GOURY, J. Y JONES, O. *Plans, Elevations, Sections and Details of the Alhambra*, Londres, 1842-1845; JONES, O. *The Grammar of Ornament: Illustrated by Examples from various Styles of Ornament, One Hundred and Twelve Plates*. Londres: Day and Son Ltd., 1856.



IL. 3. José de Hermosilla. Plan of the Alhambra. Real Academia de Bellas Artes de San Fernando.



IL. 4. Juan de Villanueva. Section of the tower and court of Comares. Real Academia de Bellas Artes de San Fernando.

me more prominent. This is partly due to the fact that we are dealing with a building of very complex geometry, with many irregularities and in which the exclusive use of linear measurements leads irremissibly to this type of inaccuracy. Something simi-

lar occurs with the lower floor of the Royal House and the layout of the Generalife, whose courtyard does not show the skew it actually has. The section of the tower and the Court of Comares, drawn by Juan de Villanueva (Il. 4), are made with genuine

virtuosity and are very expressive, despite certain metric errors that accumulate as it moves into more inaccessible areas, generating an increase in the height drawn in comparison with the actual height.

Nevertheless, the drawn and published plans constitute the first architectural study of the complex carried out with a coherent sense of globality, with the idea of transmitting or showing the reality of the Alhambra as a fortress set in a territory and as a palace complex, diachronic in terms of the genesis of its different parts, but in the understanding that the structure obeys ideas whose logic was being unravelled. Taking into account the means available at the time, the academics' work was nothing short of memorable, not only did they spread the word about our country's heritage, but also left us a conscientious documentation of the state of the Alhambra in the second half of the 18th century, carried out with great scientific rigour, generally far and above that of other later artists who in many cases limited themselves to copying or plagiarizing this work.

What is really interesting in this work is that the study and architectural analysis of the Nasrid palace is not only approached from an archaeological viewpoint, looking for the mere documentation of a number of antiques, but also involves instruments typical of architecture, even if it is based on concepts related to the prevailing style. It seeks to find in its different elements canons and modules such as those used in the classical architecture of Vitruvius, e.g. the search for symmetry, the definition of the column and the arch typical of the Arab style or the definition of proportion¹². All of this can be seen in the analyses carried out to find the original structure of the palaces and its expression in hypotheses that today produce a certain perplexity¹³ but which are fruit of a method typical of the ideas that prevailed at the time. In this interpretation we can also see the thinking of the enlightened Spaniards who approach the study of the arts evolved with respect to medieval styles, moving on from specific disdain as works on the fringes of the classical world, to being appreciated not only as testimonies of a historical moment, but also as bearers of aesthetic values beyond the strict rationality of classicism. If one thing is re-

grettable, it is that the work was not more extensive, involving other parts of the buildings, which would be of valuable assistance in many of our current investigations.

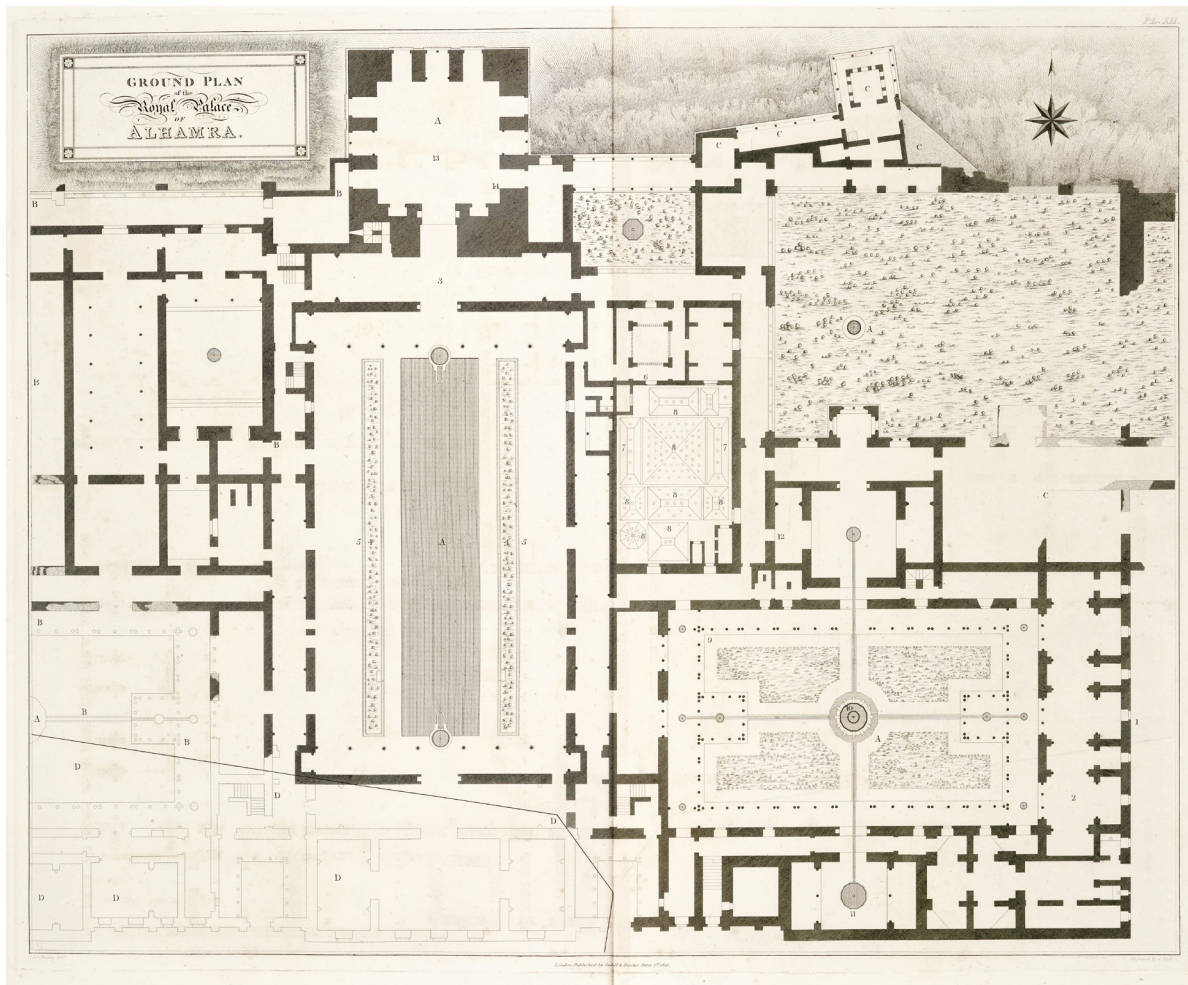
In the 19th century, there were many publications containing an abundance of drawings and plans of the Alhambra. The enlightened spirit of the previous century gave way to the development of an interest in the Orient helped along by romantic ideals in a movement that sees the value of ancient monuments as expressions of history. Not only is the classical world valued, but also the medieval is rediscovered. The Alhambra thus becomes a focus of attraction as it is the «oriental» monument closest to countries in Europe. Travellers and scholars show their interest in it and publications appear to spread the word. In many of them, the drawings by Hermosilla are copied more or less accurately, although there are also important contributions that are now a source of information on the state of the complex before the important restoration work carried out in the second half of the 19th century and the first half of the 20th. However, it is important to remember that the romantic spirit that is generally behind these works favours idealisation and, consequently, invention, in line with the first restoration works carried out in the 19th century.

We must first of all refer to the work of Alexandre de Laborde *Voyage pittoresque et historique de l'Espagne* in which, in the case of the Alhambra¹⁴ rather than drawing up a new planimetry, the author used the one carried out in the previous century. Thus, almost all the plans published by Laborde are copies of those made by Hermosilla and its collaborators. The small differences in the drawings seem to be caused more by error or forgetfulness by the printer

12. RODRÍGUEZ RUIZ, D. (1992), *Op. cit.*, 73-112.

13. ALMAGRO GORBEA, A. (2015), *Op. cit.*, cat. 48.

14. DE LABORDE, A. *Voyage pittoresque et historique de l'Espagne*, Paris 1812. Pl XXIV-LXXIV.



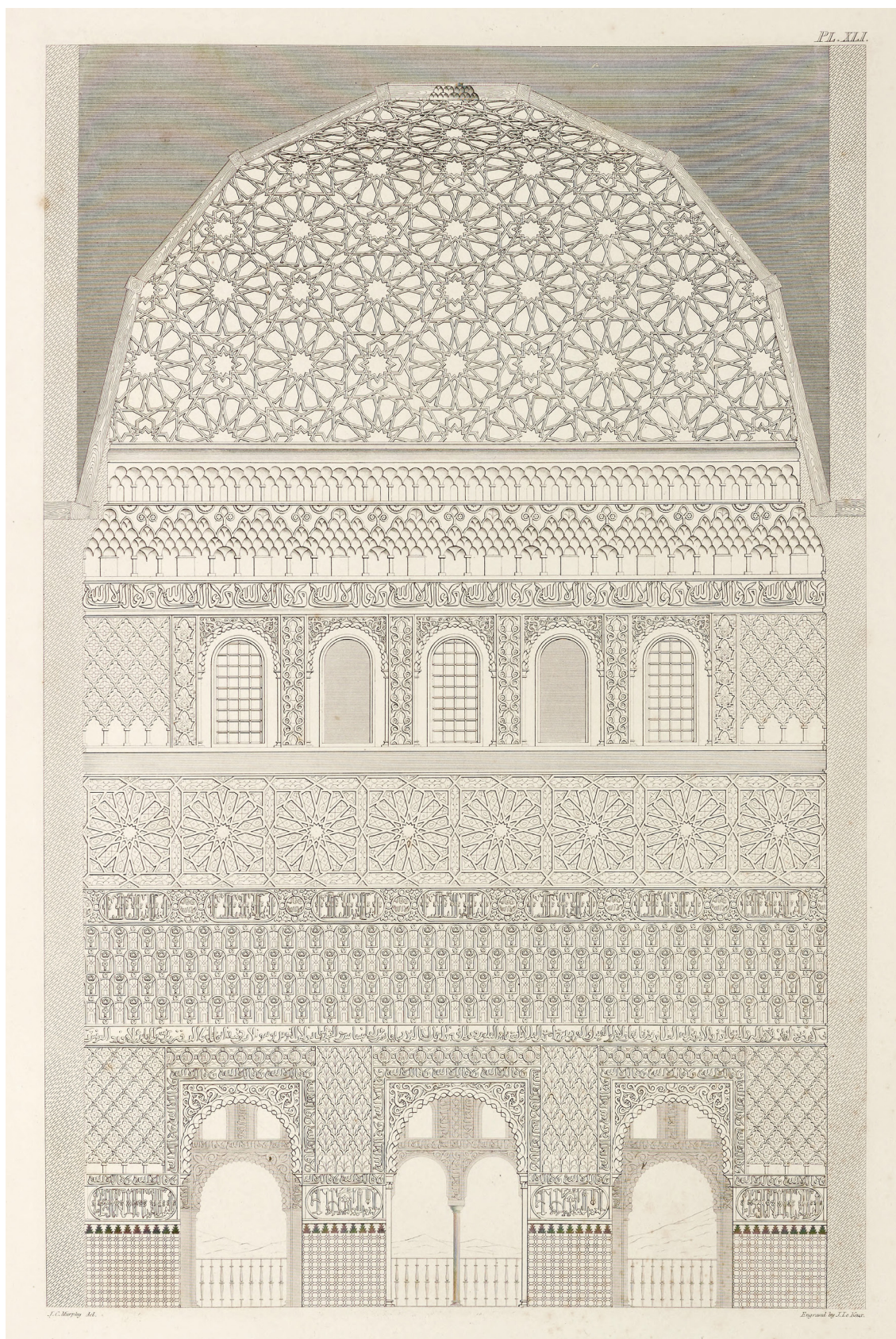
IL. 5. John C. Murphy. Plan of the Royal Palace of the Alhambra. Murphy 1813: Pl. XII.

than by real corrections, as they do not affect much more visible, gross errors.

The work by James Cavanah Murphy, *The Arabian Antiquities of Spain*, published in 1813 after the author's death¹⁵, is notably more extensive than previous ones, the result of a long stay by the Irish architect in our country. In the case of the general plan of the Alhambra fortress, it is clear that the Hermosilla plan has been completed with the one Francisco Dalmau made of all Granada in 1796. The graphic scale has been transformed from Spanish feet to English feet, but the accuracy of the details is maintained, although Christian elements are simplified in an effort to highlight their Islamic counterparts. All the buildings and plots represented in the Alhambra coincide exactly with the plan of Hermosilla.

His plan of the Royal Palace is a mixture of hypothetical reconstruction and real drawing, but not very accurate in both cases (Il. 5). The hypotheses, such as the existence of a court symmetrical to that of the Lions, copied from Hermosilla, are completely unfounded. In trying to remove the Christian additions from the drawing, such as the new rooms of Charles V, he makes a notable mistake in assuming that the gallery leading to the upper loggia of the Queen's Dressing Room and the Dressing

15. MURPHY, J.C. *The Arabian Antiquities of Spain*. London 1813.



IL. 6. John C. Murphy. Section of the hall of Comares. Murphy 1813: Pl. XLI.

Room itself are Muslim. Even in terms of metrics the plan is not reliable. Apart from the lack of graphic scale, what can be deduced is that it follows the Hermosilla plan very closely, correcting its most visible errors, but maintaining absolute regularity and perpendicularity in the walls and structures, which finally leads to serious error.

The published plan of the bathroom has the same defects. He tries to reconstruct the old Muslim bathroom and confuses structures that Hermosilla himself had identified as Christian. Although he corrects Hermosilla's biggest mistakes, he makes others, such as assuming that the oven room is connected to and integrated with the hot room. The plan of the Generalife seems to have followed a similar process. Basically, the plan copies that of the Academy and thus contains many of the same errors, but also new errors and a number of corrections or additions that are also somewhat unreliable.

The interior elevation of the Hall of Comares (Il. 6) seems to be based on data taken by Murphy himself as the detail is dealt with much better than in Villanueva's drawing. Despite this, there are still errors in the heights that suggest he took them from the latter. It can be said that Murphy's drawings are the result of having transferred a number of very incomplete sketches to very well drawn, printed plans and many of them may have been made with the Hermosilla drawings before him to complete some of the details.

In 1837, the book by Girault de Prangey *Souvenirs de Grenade et de l'Alhambra* was published in Paris. At the end of the book there are two prints with plans of the Alhambra¹⁶, which are the result of his stay in Granada between 1832 and 1833. Although they are less ambitious than Murphy's, they are a coherent series and are evidently the result of own measurements rather than copies of others, with a few exceptions.

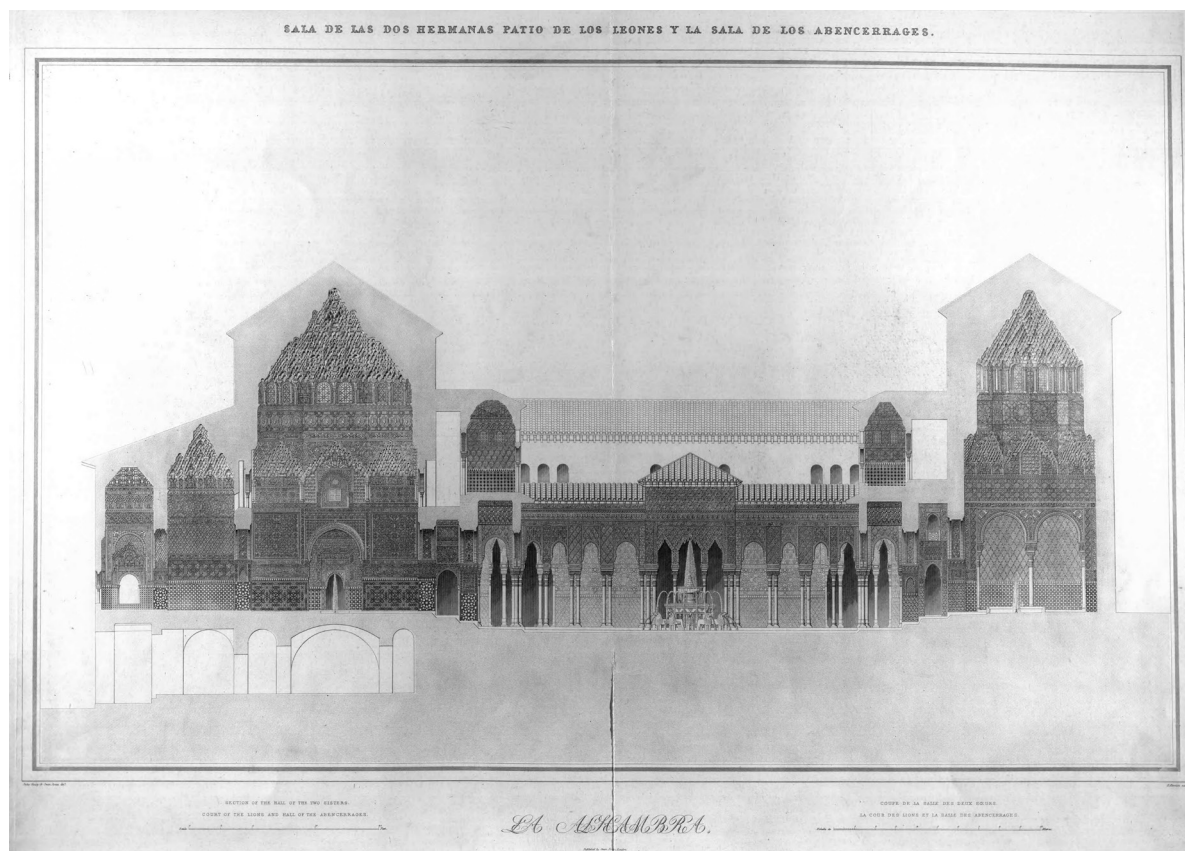
In one print he publishes a general plan of the fortress that is nothing more than a reproduction of the one in the Dalmau plan, with the same errors of dimension, but correcting some of the details, such as the lack of alignment of the axes of the tower and the Court of Comares. The origin of this plan is

also evident from the fact that it is scaled in yards, like the original plan, while the other drawings are scaled in metres. It should be noted that Girault de Prangey no longer draws buildings in the Secano, which he labels as «uncultivated land and ruins» but continues to draw the destroyed tower between that of Abencerrajes and the Puerta de los Carros. The same print shows a floor plan of the Royal House, not very complete and with a serious error in the length of the Court of Comares, drawn almost 4 metres longer than it actually is. This leads to a similar error in the location of the Court of the Lions, which is displaced to the south. In general, the spaces have been regularized and the perpendicularity of the walls, often non-existent, has been maintained.

Of the sections published, the longitudinal section of the Court and Tower of Comares contains the same error in the distance between the porticoes referred to from the floor plan. However, the section and interior elevation of the tower is more precise and better measured than that of Villanueva and Murphy. Girault de Prangey also publishes a cross-section of the Court of Comares with the elevation of the tower and the portico that precedes the hall. Here again, there are very gross errors, indicating a careless and, above all, very incomplete measurement process.

Although Girault de Prangey's plans are not clearly intended to be extremely precise, as evidenced by the relatively small scale at which they have been reproduced, they claim to be the fruit of uninfluenced, direct observation. His purpose seems to be more to illustrate and complement the other prints in his book with scale drawings. Although there are palpable, gross errors, the data they provide are worthy of attention, even if the metrics cannot be accepted too readily.

16. GIRAULT DE PRANGEY, J.P.H., *Monuments Arabes et Moresques de Cordoue, Séville et Grenade, Dessinés et Mesurés en 1832 et 1833, par Girault de Prangey*. Paris 1837, Pl. 29.30.



IL. 7. Jules Gourey y Owen Jones. Section of the palace of the Lions. Gourey and Jones (1837- 43).

Without doubt the most ambitious documentation of the Alhambra carried out in the 19th century is the monumental work by Owen Jones and Jules Gourey, published in London between 1837 and 1842¹⁷. The two volumes of *Plans, Elevations, Sections and Details of the Alhambra* are the result of two stays in Granada, one in 1834 by both authors, at the end of which Gourey died of cholera, and a later one by Jones in 1837. Both architects had previously travelled to various areas of the Mediterranean, making drawings and documenting architecture. In the preliminary note, attention is drawn to the authors' intention to «provide the public with a more perfect reproduction of the Alhambra than those obtained until then». It must be acknowledged that the quality of the drawings and, above all, the prints in this work is exquisite, even if in the end more emphasis is placed on the documentation of the decoration than on the architecture itself.

The general plan of the complex is obviously original in the way it is represented; however, there are doubts as to whether it was done with own measurements or using one of the existing plans, more specifically the one by Hermosilla, with which it has a number of similarities. The area of the east wall and in particular the towers of "El Agua" and the Turret of "La Carrera" are drawn only very vaguely on this plan, undoubtedly reflecting the state of ruin they were in after being blown up by the French troops. The street and plot plan shows differences with the Hermosilla plan, which also proves that, at least in detail, it was drawn on the basis of new data.

17. GOURY Y JONES (1842-1845), *Op. cit.*

The floor plan of the Arabian Royal House is also an original drawing, as stated in the drawing itself, measured by Jones and Goury. However, this plan also leaves something to be desired in terms of metrics and, although in some aspects it improves on the Hermosilla plan, it still contains too many gross errors. Thus, he continues to draw the Court of Comares as completely regular and labels the distance between the porticoes corresponding to one of the sides on the opposite side, which measures almost one metre less. In the Court of the Lions, he limits the distance of its length to 37 metres when in fact it is only 34.90 m. There are also important errors in the Court of Lindaraja and the Queen's Dressing Room, whose tower-roof lantern has a rectangular layout when it is square. The plan is full of other small errors, just like the ones we have analysed so far and offers little improvement on the one by Hermosilla. In other details, it seems to copy, at least partially, Murphy's plan.

The section of the Hall of Comares is quite correct in terms of overall dimensions. However, as in almost all the drawings we have analysed, there are small differences in the heights of the various decorative bands, making the location of the upper windows somewhat more correct. The waste of preciousness and detail in the print does not correspond to the accuracy one would expect. The drawings do not lack expressiveness and vigour in representing the actual architecture and decoration, but in a certain sense it is an ultimately vain effort and lacks the rigour they seem to express (Il. 7).

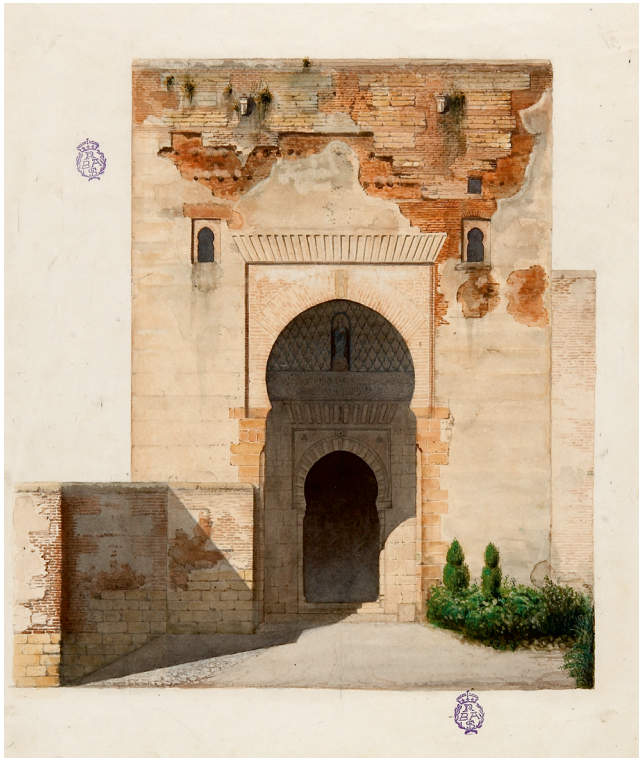
From the second half of the 19th century there are other plans, of the Alhambra thanks to the Contreras family. In his book *La Alhambra, El Alcázar y la Gran Mezquita de Occidente*, Rafael Contreras publishes two plans, one of the complex and another of the Arab palace of the Alhambra. Both are contained in two foldable inserts, with no graphic scale, although the numerical scale of each is indeed given. The general plan of the complex is remarkably inaccurate and constitutes more of a sketch than an actual plan. The plan of the «Arab palace» is not very accurate either because of the small scale used, but it is undoubtedly taken from the same measurements as those published in the series of prints in *Monumentos Arquitectónicos de España* by Francisco

A. Contreras. The only differences between the two plans are the different drawings of the gardens, as well as a number of minor details. Special mention must be made of the plan in this set that incorporates the restorations and research work carried out in the palaces up to that time, which are included with a layout of the various areas very similar to today's.

Another splendid collection of drawings of the Alhambra is the one made as part of the great project of the *Monumentos Arquitectónicos de España*¹⁸, also undertaken under the direction of the Royal Academy of Fine Arts of San Fernando and promoted by the Ministry of Public Works. The project sought to be an accurate, scientific documentation of great aesthetic quality of the most outstanding monuments of Spain, made by remarkable artists and draughtsmen and glossed by prestigious researchers of the day. Twenty-two prints were made of the Nasrid architecture of Granada, including both architectural and decorative elements, published between 1859 and 1886. Apart from the aforementioned plan of the Royal House, special mention must also be made of the floor and elevation of the Puerta de la Justicia, the façade of Comares and parts of the Court of the Lions, the Hall of Justice and the Hall of the Kings. The prints were made with care and precision and were lithographically illuminated, providing the chromatic data to the documentation.

Unlike the work by Hermosilla, Villanueva and Arnal, the documentation of the Alhambra carried out in the *Monumentos Arquitectónicos de España* lacked a pre-established plan and it seems that its execution was due to the initiative of the various authors rather than any clear guideline or instruction. In general, there is an idea of not repeating the drawings already published in the 18th century, but this resulted in most of the work being partial surveys void of any clear thread. The fact that va-

18. ALMAGRO GORBEA, A. (2016), *Op. cit.*



IL. 8. Left: Francisco A. Contreras. Elevation of the puerta de la Justicia by Francisco A. Contreras. Real Academia de Bellas Artes de San Fernando. Right: Francisco A. Contreras. Photogrammetric restoration with orthoimage. Real Academia de Bellas Artes de San Fernando.

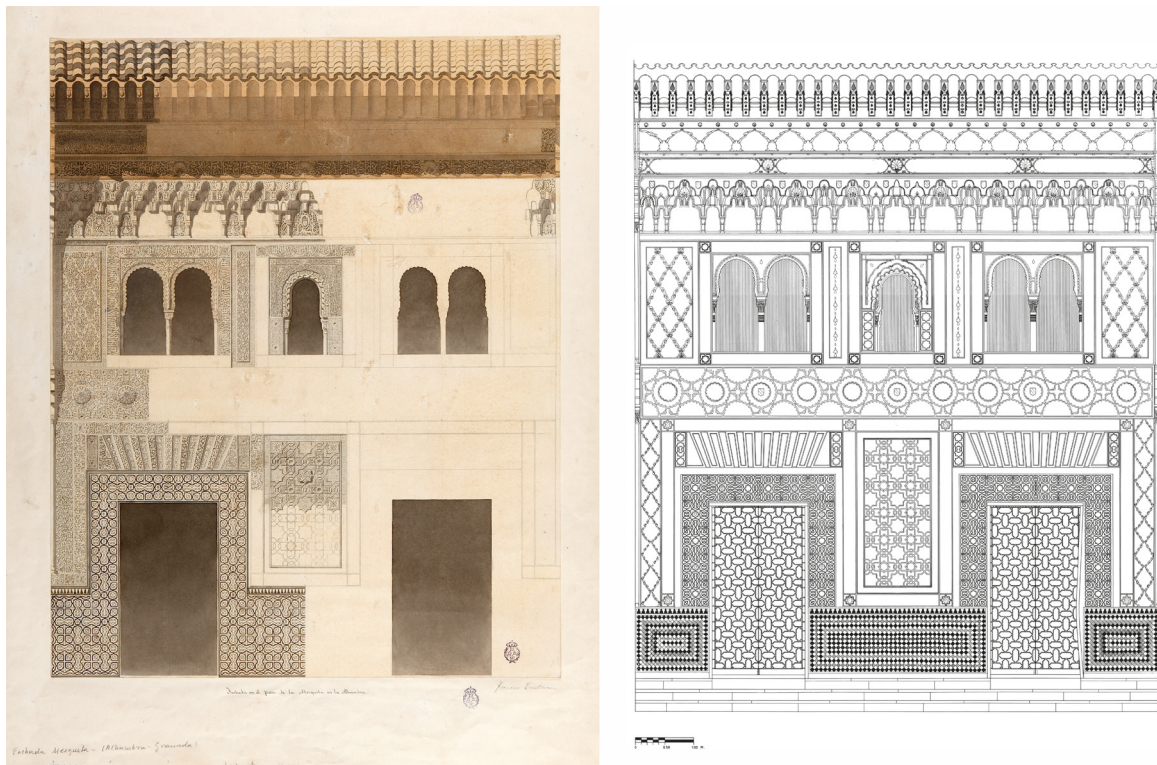
rious authors were involved probably did not help the desired planning either, and although the graphic quality of the drawings is unquestionable, the same is not true of the metric precision, at least as far as we have been able to analyse from drawings by Francisco Contreras. (Il. 8). In others, errors are noted in the representation of the epigraphy, changing the place of some of the inscriptions, which seems to indicate that part of the work, especially that of the authors not resident in Granada, was done with the help of photographs and, in some cases their correct location seems to have been interpreted incorrectly. The impression produced by this work is somewhat similar to that of Sánchez Sarabia. It seems that, given the lack of comprehensive and detailed documentation of the monument, it was decided to select areas or details that attracted attention because of their delicate decoration, so the result corresponds more to a treatise on ornamentation than a genuine architectural study. These works also largely express the ideas and criteria prevailing at the time, which were materialised in the so-called «stylish» or «ornamental» restoration,

more concerned with aesthetic ideals than with respect for historical reality. Some of the drawings by the Contreras show situations after their interventions (Oratory of El Partal)¹⁹, but others include proposals that finally materialised in a different way from what was drawn (Façade of Comares)²⁰ (Il. 9). Basically, these drawings respond to the prevailing criteria in restoration at the time, which idealise what they represent just as the interventions in the monument sought to remake an ideal building that in many cases never existed.

Many plans of the Alhambra were published during the 19th and 20th centuries and were ei-

19. ALMAGRO GORBEA, A. (2016), *Op. cit.* Cat. 104.

20. ALMAGRO GORBEA, A. (2016), *Op. cit.* Cat. 102.



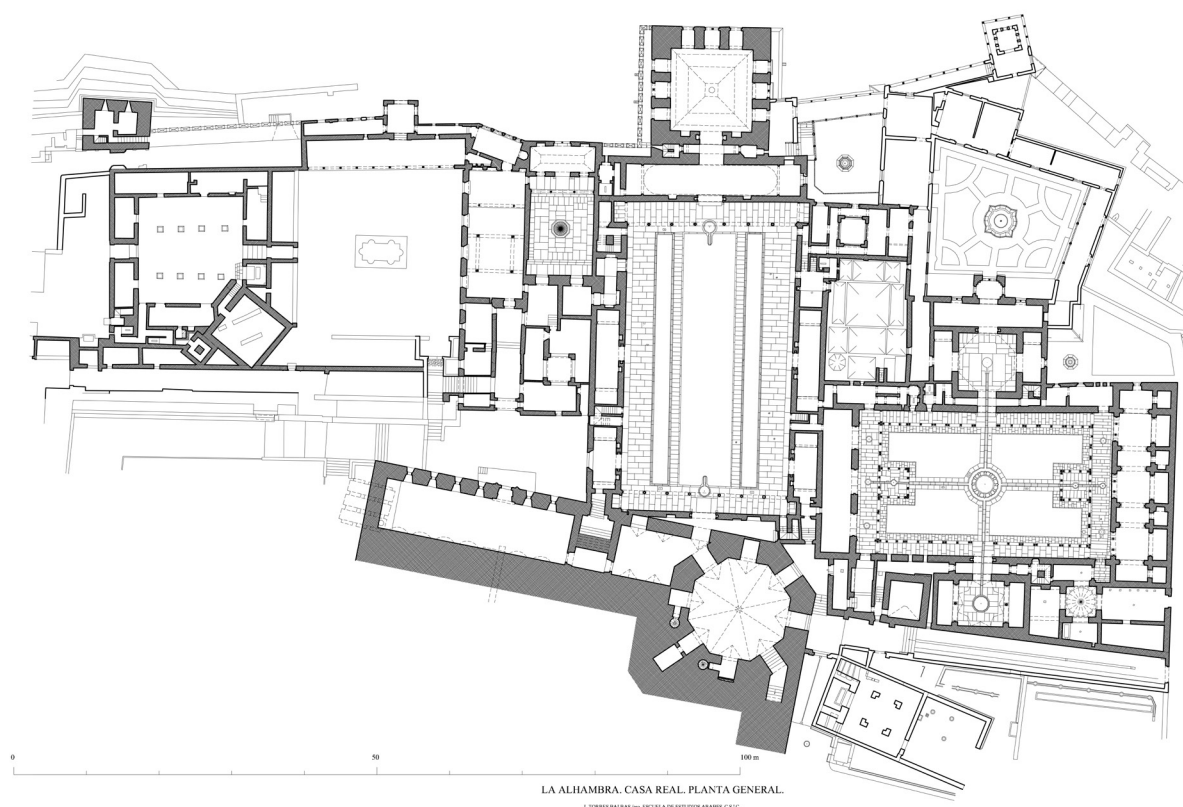
IL. 9. Left: Francisco A. Contreras. Elevation of the door of the palace of Comares.
Right: Manuel López Reche. Elevation of the door of the palace of Comares. APAG.

ther general plans of the complex or of the Royal House. Practically all of them are more or less accurate copies of the ones we have analysed and therefore do not deserve further attention. At the beginning of the last century, we have the first plan of the complex made using a modern topographic technique. More specifically, it is the Plan of the City of Granada by the Directorate General of the Geographic and Statistical Institute directed by Ibáñez de Ibero, made in 1906. It is a plan printed in colour on several sheets. In one of them, the entire Alhambra enclosure is represented with details of the layouts of the interior buildings, although other external elements, such as the Generalife, only appear drawn with the perimeter of their walls. This is a dimensionally correct plan as far as the Alhambra is concerned. The street and plot plans of the interior of the enclosure basically coincide with the Hermosilla plan, which adds reliability to both and confirms that the urban organisation remained almost unaltered throughout the 19th century, although the evolution of the building can be followed with

both plans. In spite of everything, errors can be seen in the location of the enclosure in respect of the Darro River and the Albayzín.

As a result of the fire that destroyed, among other areas, the Hall of La Barca in 1890, a new era in the documentation of the Alhambra began. This catastrophe led to the intervention of the architect Ricardo Velázquez Bosco, who, as inspector of Monuments in the Southern Zone, drafted a General Restoration Plan for the Alhambra with a series of projects whose documentation begins to include plans showing the real state of the monument that constitute an important source of information²¹.

21. VALDELLOU, M.A. *Ricardo Velazquez Bosco*. Madrid: Ministerio de Cultura, 1990. p. 157-184.



IL. 10. Leopoldo Torres Balbás. Plan of the Royal House of the Alhambra. School of Arab Studies (CSIC).

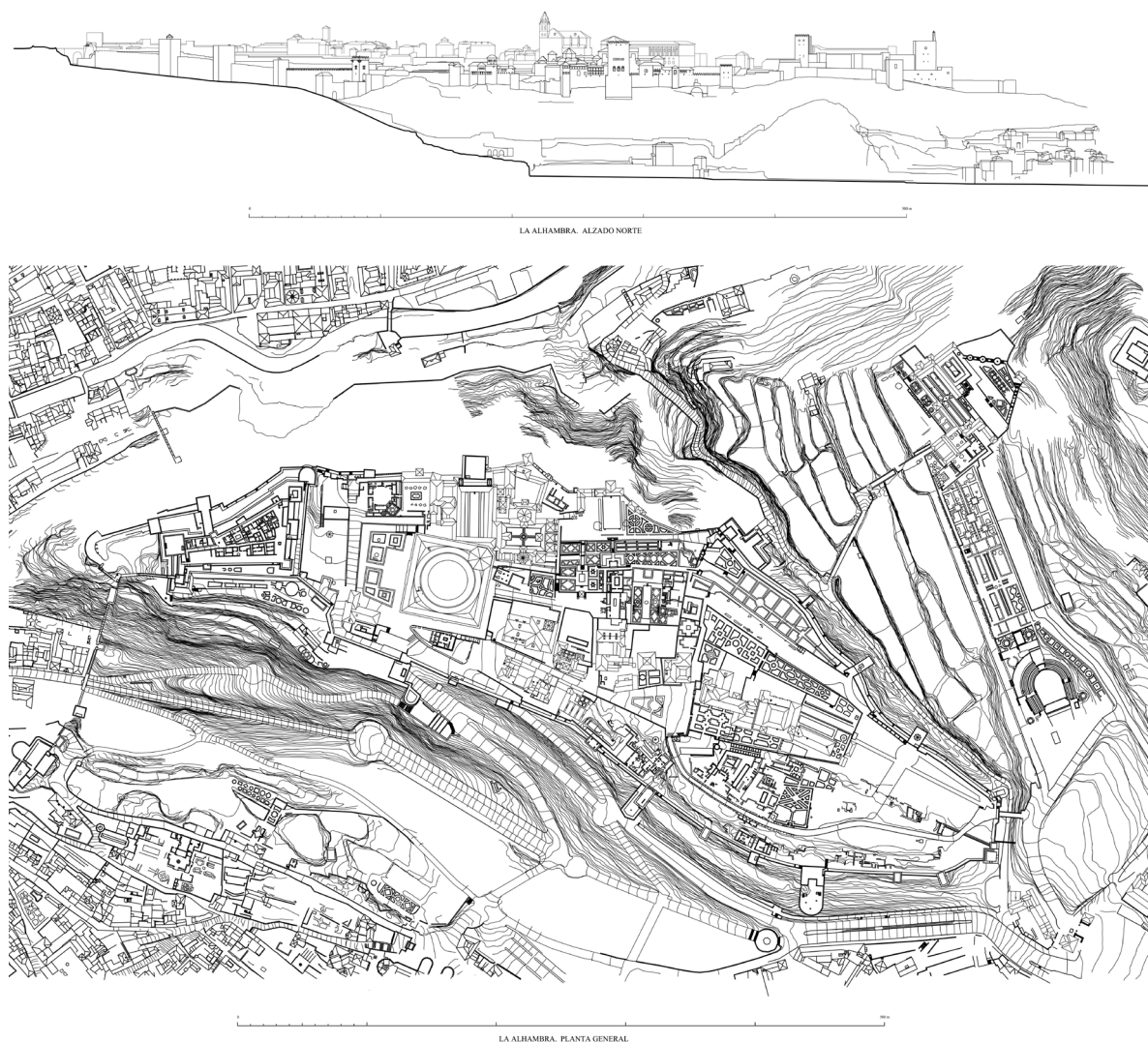
The death of Ricardo Velázquez in 1923 coincides almost exactly with the arrival at the Alhambra of Leopoldo Torres Balbás, to whom we owe the most precise and documented set of plans for the monument produced until then. The new planimetry from this moment on is the faithful reflection of the change of criteria and approach in the conservation of the Alhambra. The drawings start to have a wealth of archaeological information and are the expression of detailed analysis and studies of the buildings and the subsoil. They are part of a modern and precise documentation, undoubtedly the most important source of knowledge of the monument²².

Of the plans drawn up by Leopoldo Torres Balbás, those of the Royal House are worthy of special mention, the one for the general floor being dated 1925 (Il. 10), and the lower floor 1927. Just a quick look at these drawings now shows that the person responsible for them was a detailed and meticulous

person, since each plan is in itself a rigorous and detailed analysis of the buildings of the Royal House in which the different periods of construction, reforms and alterations are shown with all the clarity possible of a document of this type, as well as a details too numerous to list.

In terms of metrics, this plan of the Royal House is by far the best of those made. It represents in full detail the deformations and irregularities of the walls, rooms and courtyards and the measurements that can be deduced from it are accurate and reliable. This is why we are faced with an extremely detailed and reliable plan, where the pre-

22. ALMAGRO GORBEA, A. *Estudios islámicos de Torres Balbás. En Leopoldo Torres Balbás y la restauración científica. Ensayos.* Granada: Patronato de la Alhambra y Generalife e Instituto Andaluz del Patrimonio Histórico, 2013. p. 355.



IL. 11. Photogrammetric plan of the Alhambra restored at the ICRBC and digitized at the School of Arab Studies (CSIC).

cision of the detail is accompanied by remarkable metric accuracy. This plan is probably the synthesis of a form of documentation that Torres Balbás extended to all the buildings he had the opportunity to restore. Except on rare occasions, the plans available in these cases provide accurate, detailed information.

Apart from the extensive bibliography relating to the Alhambra left by Leopoldo Torres Balbás, fruit of his profound knowledge of the monument, his most valuable legacy from the scientific point of view is constituted by these plans and his Diary of Works. In said documents, Torres Balbás does not leave us his theories, but rather objective data,

the result of his observation and analysis. They are like the sources in which to search for the rigorous, accurate information that guarantees the possibility of continuity in the investigation of the monument. An important part of the information provided by the plans and the Diary is today hidden, as is logical after the restoration processes, but, thanks to these documents, not lost. The work carried out by Torres Balbás in the Alhambra enabled the formation of a team of technicians who, after completing their responsibilities regarding the monument, continued their excellent work under the direction of Francisco Prieto Moreno. The draughtsmen Manuel López Bueno and Manuel López Reche are the authors of splendid drawings

such as those of the Puerta de la Justicia or the façade of the Palace of Comares²³ (Il. 9).

From the second half of the 20th century there are four general plans of the complex as a whole. One of them dates back to 1948 and was made under the direction of Francisco Prieto Moreno. There are several versions of this plan, some coloured and others updated, and they have been used as the basis for all the official cartography of the Alhambra for a long time. Although it is a plan made in some detail and includes the interior layouts of the buildings, it also contains errors, especially with regard to the absolute location of some elements, undoubtedly caused by the complexity of the building and the abrupt topography of the site.

Another plan, which is preserved in the archive of the Alhambra, and practically unpublished, is the one made also under the direction of Francisco Prieto Moreno in 1958 with subsequent updates²⁴. This plan is undoubtedly based on a topographical survey, since it shows stations drawn with their corresponding altimetry coordinates. The interior floors of the various buildings and ruins were included in it, probably copied from the partial planimetry that exists in the archive.

Finally, before the end of the last century, two general plans of the Alhambra were made using photogrammetry: one was drawn for the drafting of the General Plan for the Urban Development of Granada in 1982 at a scale of 1/1000; the other, made by the Institute for the Conservation and Restoration of Cultural Heritage in 1985, served as the basis for the first Special Plan of the Alhambra and Alijares²⁵ (Il. 11). The latter is undoubtedly one of the most detailed and accurate to date, as its main purpose was to study and preserve the monument itself. It also has different sections and elevations of the complex as a whole that facilitate its understanding and analysis.

In the late twentieth century, with the creation of the Photogrammetry Office at the Institute of Conservation and Restoration of Cultural Property of the Ministry of Culture, photogrammetric surveys of the Alhambra began, since it was one of the monuments chosen for the possibilities enabled by

the technique²⁶. Conceived as documentation work, with no immediate application in the restoration work, the southern façade of the Palace of Carlos V was refurbished (Il. 12), together with a number of decorative elements in the Hall of Comares (Il. 13). But, above all, mention must be made of the project for systematically documenting all the plasterwork in the hall by taking metric photographs of all the walls from a short distance. Such photographs were then to make it possible to restore all the decoration on a 1/1 scale (Il. 14). The documentation is kept in the current Spanish Cultural Heritage Institute and has never been fully restored. It is valuable information not only for research, but also in the event of unwanted deterioration or ruin of the monument. In subsequent years, the School of Arab Studies at the CSIC has carried out new photogrammetric surveys on the exterior elevations and sections of the tower of Comares²⁷, the bathroom of the palace of Comares (Il. 15) and the palace of El Partal Alto, among others. In recent years laser scanning techniques have also been used in various projects, such as the restoration of the Lion Fountain, a survey carried out by the University of Granada. All these documents meet the current criteria required for any work on heritage and what should be expected in a monumental ensemble of universal fame.

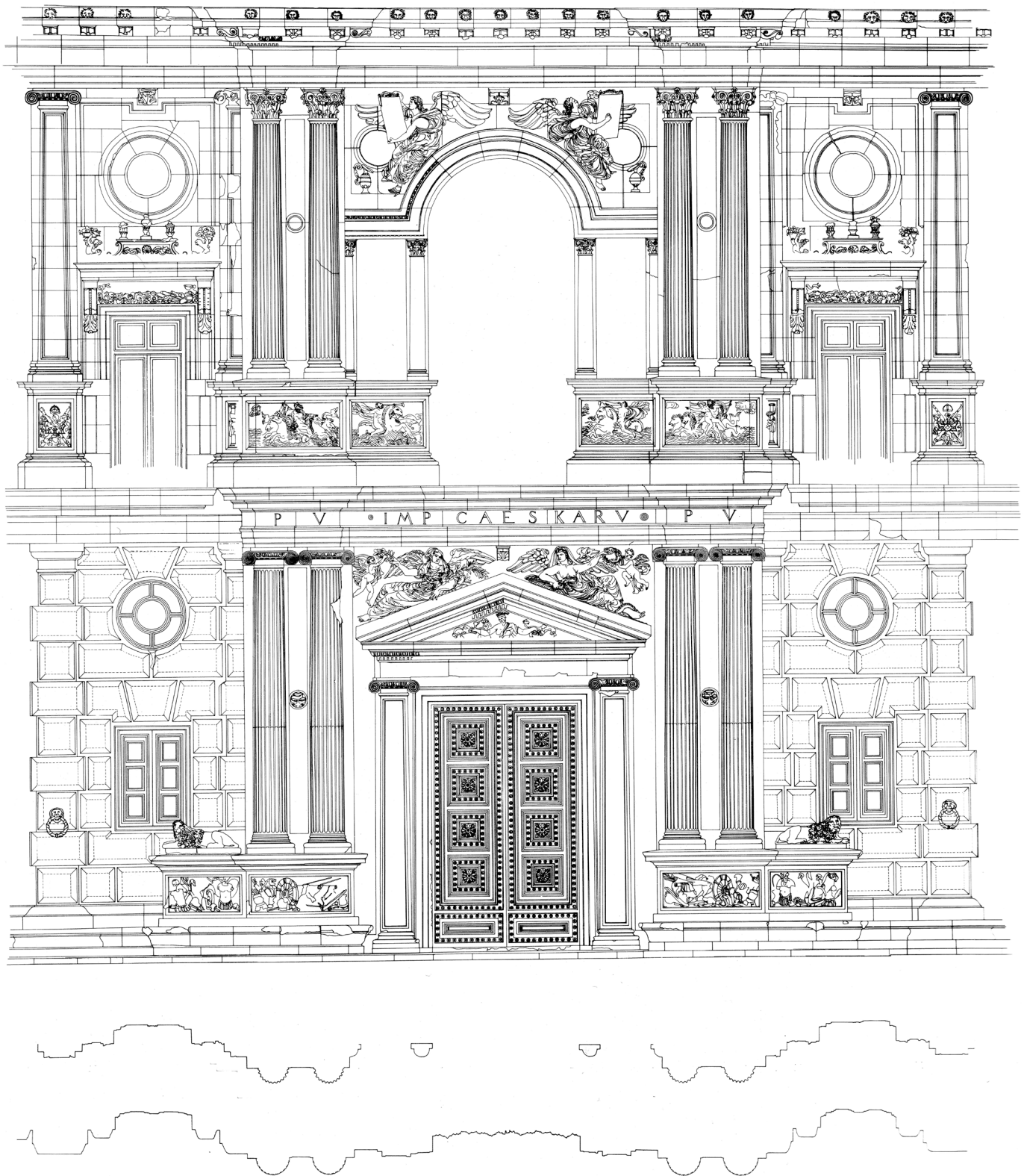
23. FERNÁNDEZ PUERTAS, A., *La fachada del palacio de Comares, I, Planos*. Granada: Patronato de la Alhambra, 1980; <https://www.alhambra-patronato.es/ria/handle/10514/5360> (15/07/2020)

24. [https://www.alhambra-patronato.es/ria/handle/10514/3727\(-3732\)](https://www.alhambra-patronato.es/ria/handle/10514/3727(-3732)) (15/07/2020)

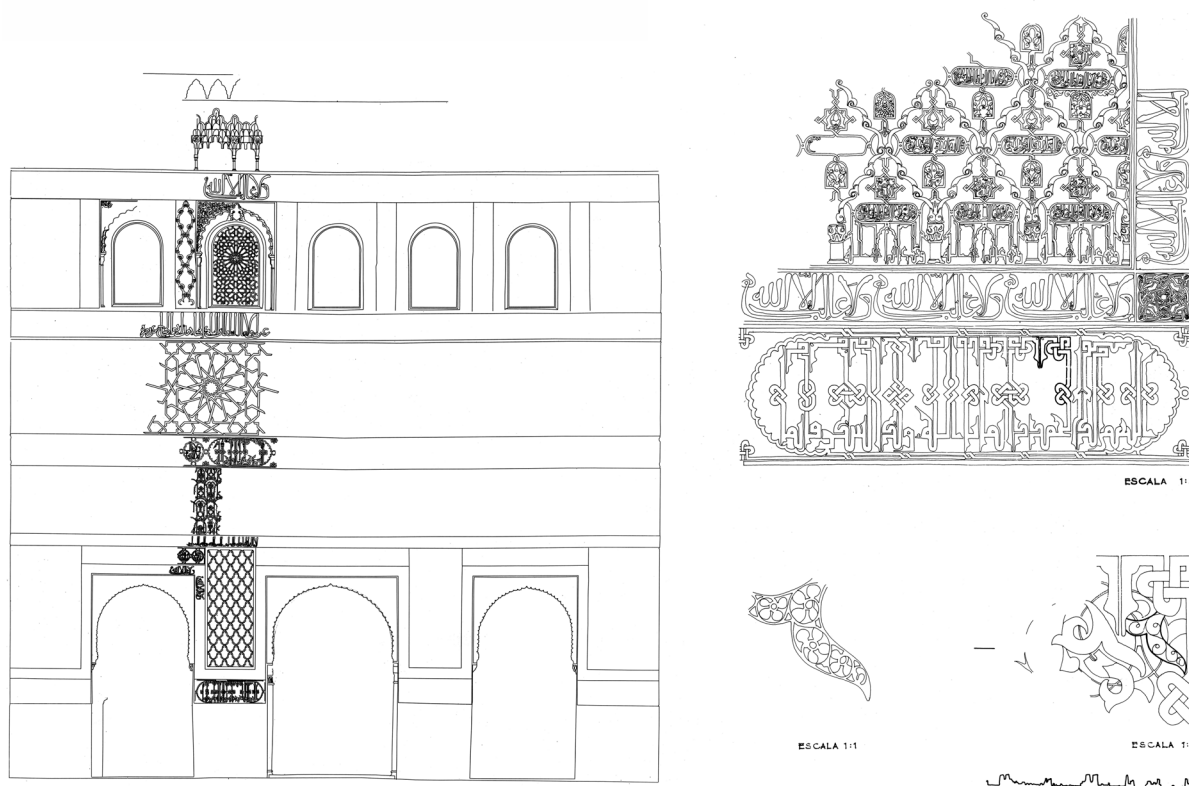
25. Plan Especial de protección y reforma interior de la Alhambra y Alijares. Granada: Consejería de Obras Públicas y Transportes, Ayuntamiento de Granada y Patronato de la Alhambra, 1986. The publication included an extensive collection of earlier graphic documents.

26. ALMAGRO GORBEA, A. *La Alhambra y la representación de su arquitectura*. En Almagro, A. (Ed.) *Fotogrametría y representación de la Arquitectura*. X Symposium Internacional CIPA. Granada: Comité Nacional Español de ICOMOS, 1988. p. 141-154.

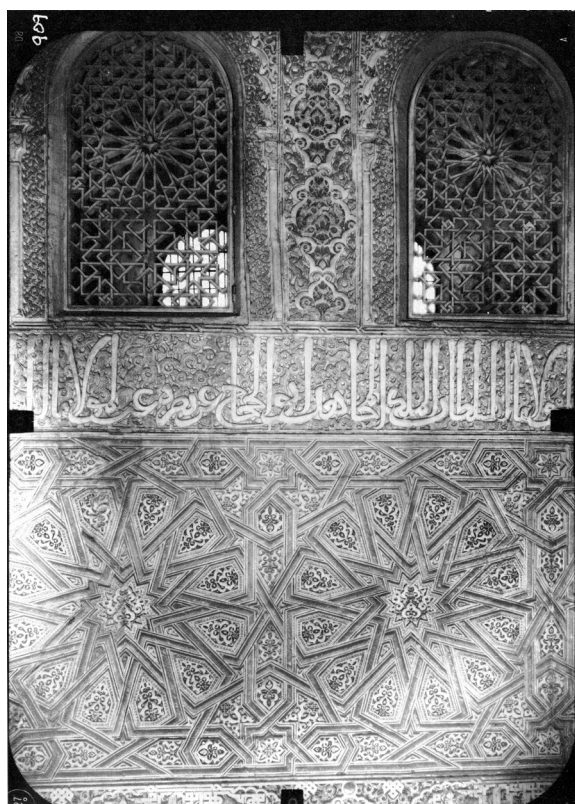
27. ALMAGRO GORBEA, A.; JIMÉNEZ MARTÍN, A. *Jardín con plantas y alzados de papel*. In Jiménez Martín, A. (Ed.) *Arquitectura en al-Andalus. Documentos para el siglo XXI*. Granada: El legado Anadalusi-Lunwerk, 1995, p. 272-279.



IL. 12. South elevation of the palace of Carlos V. Photogrammetric restoration by the ICRBC (IPCE).



IL. 13. Restoration tests on the plasterwork of the hall of Comares at different scales by the ICRBC (IPCE).

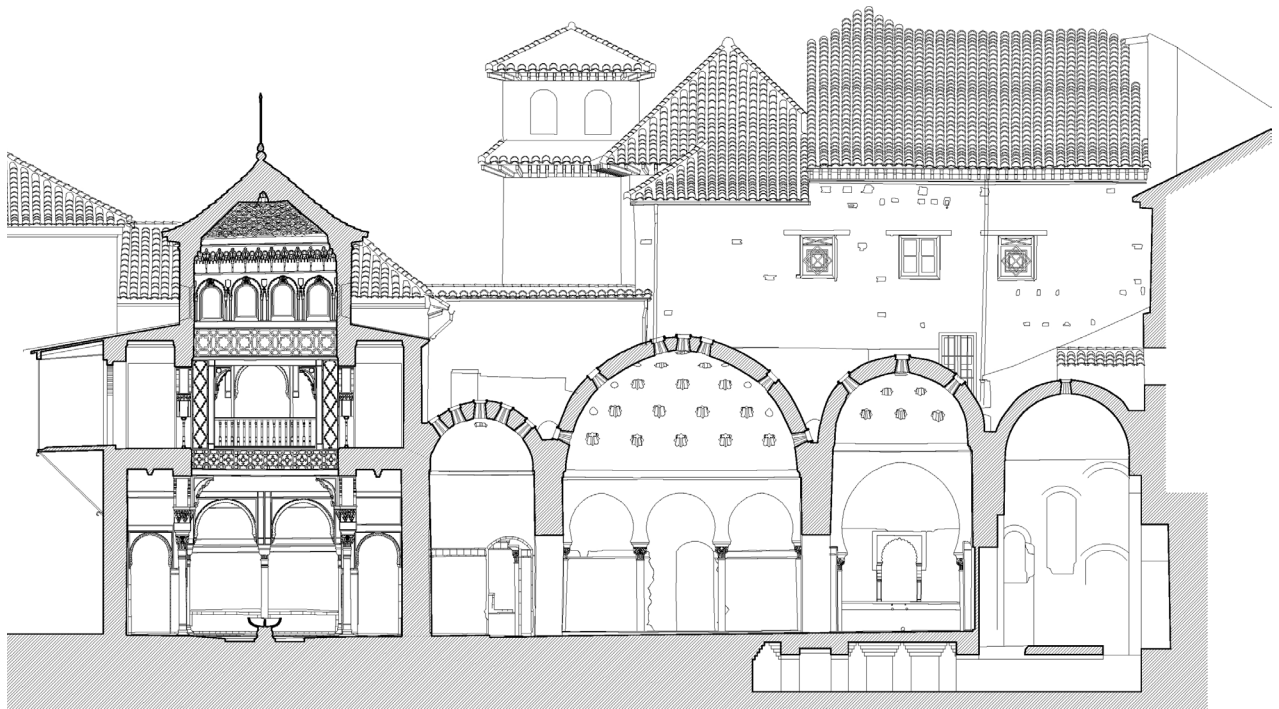


IL. 14. Metric photograph of the plasterwork of the hall of Comares.

The Alhambra is undoubtedly a privileged monument in many ways. This also applies to its documentation. Apart from the already mentioned bibliography, especially from the 19th century, which contains many graphic surveys, its copious archive treasures written documents and a huge number of plans and drawings that can be consulted today on the website of the Patronato de la Alhambra y el Generalife²⁸. The drawings of the San Fernando Academy can also be seen on their website²⁹, which also includes the most modern drawings we have made in recent years. Thus, you can follow its life and evolution through images and plans. This means there is reliable, current documentation that guarantees a good knowledge of the complex as a whole. As a result, we have details of the ups

28. <https://www.alhambra-patronato.es/ria/handle/10514/16> (15/07/2020).

29. <https://academiacolecciones.com> (15/07/2020).



IL. 15. Photogrammetric section of the bathroom of Comares (EEA-PAG).

and down it has been through and the criteria that have been applied for its protection and conservation. However, the challenge remains to improve the documentation of what is done and what we know to ensure the future conservation of the monument. If, in the 18th century, the Royal Academy of San Fernando assumed the need to guarantee the conservation of the Alhambra by producing plans and drawings of its buildings and decorations and made the resources available for their execution at that time, providing valuable documentation worthy not only of its own time, the response we face today must be equal to circumstance and the means available.