Graphic Representation of The Degree of Historical-Archaeological Evidence: The 3D Reconstruction of The “Baker’s House”

Irene Cáceres-Criado
University of Cordoba: Universidad de Cordoba

Diego Francisco García-Molina
University of Jaen

Francisco-Javier Mesas-Carrascosa
University of Cordoba

Paula Triviño-Tarradas (ig2trtap@uco.es)
Universidad de Córdoba https://orcid.org/0000-0003-1212-0926

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Abstract

Over the years, the methodologies used for graphic representation in archaeology have evolved. The substantial change in representation was achieved with the use of computer software. Currently, sketch scanning and photogrammetry are predominating tools used in this field. A new methodology, i.e., the use of the historical-archaeological evidence level scale, has entered this discipline to show the veracity of archaeological studies, as well as that of the vestiges found.

The present study is focused on the virtual reconstruction of the 'Baker's House' in the archaeological site of Torreparedones (Córdoba, Spain). The main aim of this study was to show and identify the veracity of the obtained reconstruction, through the use of the historical-archaeological evidence scale. The methodology used shows the evidence level employed by experts in the creation of virtual representations. The dissemination of the proposed historical-archaeological evidence scale entails the graphical identification of the veracity of reconstructions in this type of representations, always complying with the scientific quality criteria established by the Seville Letter.

Introduction

Representation in archaeology began with archaeological drawing, i.e., the graphical recording of heritage [1]. One of the first rules of what would be scientific excavation, proposed by M. Wheeler [2], includes the analysis of the drawing of stratigraphy as a key element. Authors such as Harris [3] and Carandini [4] expanded the use of plan drawings of excavations (strata mapping), although they only drew the most expressive levels of the sites. Another important milestone in the evolution of archaeology and archaeological drawing was the birth of architectural archaeology. In this scope, archaeological drawing is also important, maintaining its instrumental character to define the stratigraphic order (vertical strata) [1]. All these drawings were handmade by specialists. The union between manual drawing, total stations, photography and computer software would give rise to a new type of representation: photogrammetry and sketch scanning or rectified digital photography [1]. Currently, bi-dimensional (2D) and three-dimensional (3D) drawing allow reconstructing archaeological assets through three-dimensional models using photographs [5].

The draft published by the Spanish Society of Virtual Archaeology (SEAV) gathers definitions that include four types of representations in archaeological praxes [6]. Firstly, 'virtual restoration' "is focused on the ordering of the existing material remains with the aim of visually recovering what existed in the past. Thus, virtual restoration comprises virtual anastylosis". Secondly, the latter (virtual anastylosis) consists in 'the virtual recomposition of the existing parts but split in a virtual model". Thirdly, 'virtual reconstructions' aim to "visually recover buildings and objects using virtual models". Lastly, 'virtual recreation' is focused on "the virtual recovery of an archaeological site through a virtual model, including material culture, the environment, the landscape, uses and social significance" [6].

Of all the types of representations that have evolved throughout the history of archaeology, this project is focused on a new trend: the representation of the degree of historical-archaeological evidence at the scientific level [7]. While reconstructions bring archaeological remains closer to the public [8], this approach on the scale of evidence would bridge the gap between archaeological research and society, thus helping in the interpretation of virtual reconstructions and increasing their veracity.

State of the question: the historical-archaeological evidence scale

The use of colour scale codes in the scope of archaeology began in the 1990s, when these techniques were employed to show the deterioration of monuments [9]. This pioneering scale used gray hues to compare images of different time points through the application of an OR Boolean operator, thereby deducing the differences in the deteriorations of the monuments. However, the idea of using a colour graduation has its origin in the project of virtual reconstruction of the city of Byzantium in the year 1200 [7], where Patrick Clifford, Jan Kostenec and Albercht Berger aimed to support the virtual reconstructions by representing the degree of historical-archaeological evidence.

This scale has ten levels of evidence: (1) the building/object exists in its original form; (2) partially or with modifications; (3) available photographs or plans; (4) archaeological information; (5) detailed graphical evidence; (6) simple graphical evidence; (7) textual and comparative evidence; (8) textual evidence; (9) speculation based on similar structures; and (10) imagination. Each level is associated with a colour, with warmer and cooler hues corresponding to greater and lesser evidence, respectively.

From that point, some authors have used this representation scale to support their reconstructions. Pablo Aparicio and César Figueiredo applied, for the first time, the scale of the Byzantium 1200 project in their studies to verify its effectiveness [10]. The result was the establishment of a fixed colour code (RGB, CMYK and hexadecimal) (Fig. 1). Each colour of the scale is related to a level of historical-archaeological veracity or evidence: (1) imagination; (2) speculation based on similar structures; (3) basic textual reference; (4) descriptive textual reference; (5) simple basic reference; (6) detailed basic reference; (7) basic archaeological information or simple planimetries; (8) strong archaeological or documentary source; photographs and detailed ground plans; (9) existing (or partially existing) with modifications; and (10) existing according to the original. Moreover, each colour is associated with a number between 1 and 10, from lower to higher level of evidence, with the possibility of including an explanatory infogram, or simply a colour graduation along with the image. This proposition of evidence scale has been used by its authors in heritage buildings [10, 11, 12, 13, 14], although it has also been employed by other authors to support their reconstructions [10, 15, 16].

The two mentioned evidence scales differ in the reversal of the evidence levels. For the one that was developed in the Byzantium project, the evidence levels are correlated from the highest evidence level to the lowest. The scale proposed by Aparicio and Figueiredo does not modify the colours; it merely reverses

the colours, beginning with the lower levels of historical-archaeological evidence and finishing with the levels of greater evidence.

A new modification of historical-archaeological evidence scale was proposed by other authors [17], who reduced the number of levels to eight. They also modified the spectrum and colour gradation of the evidence levels. The result was a scale with a colour spectrum of dark greens to brown, with eight levels of historical-archaeological evidence: (1) speculation based on the historical, natural and cultural context; (2) speculation based on similar structures in contemporary or recent times; (3) information based on text; (4) information based on archaeological excavations; (5) simple basic representation; (6) detailed basic representation; (7) existing with modifications; (8) existing in its original format.

Lastly, it is worth highlighting the need for the SEAV to set a series of objectives in the projects carried out in the field of virtual archaeology. Thus, the Seville Letter [18], inspired in the London Letter [19], establishes the principles and criteria to measure the quality levels of projects in this scope [6, 20, 21]. The studies conducted in the field of virtual archaeology must include the scientific approach, choose suitable technology, document the process and obtain an adequate visualisation [19, 22, 23].

Research aim

The aim of this study was to produce a graphic representation of the degree of historical-archaeological evidence of the 'Baker's House' at Torreparedones, complying with the scientific quality levels established for this type of research.

Materials And Methods

Study case and background

The 'Baker's House' is located in the archaeological site of Torreparedones, between the northern limits of the municipalities of Castro del Río and Baena, in the Cordoban countryside. This building is characterised by the presence of the floor of a Roman bread oven and the foundation of what may have been a Roman rotary mill [24, 25].

The virtual documentation of the heritage using new technologies is fundamental for the preservation and protection of heritage assets, and such technologies offer new techniques for the dissemination of the world heritage [26]. The Roman *domus* of Torreparedones has a digital 3D reconstruction that was carried out from its archaeological remains and references of other contemporary *domus*, which helped to understand and identify its spaces (Fig. 2). This reconstruction [27: pending publication] meets the scientific quality criteria requested for this type of works, and it is the foundation for the application of the historical-archaeological evidence scale presented as a result in this study.

Implementation of the historical-archaeological evidence scale of Aparicio and Figueiredo 2017

The representation of the degree of historical-archaeological evidence of the ‘Baker’s House’ required the search for documentary references in order to maximise the veracity of the *domus*. After the search, we analysed the historical-archaeological evidence scales proposed in other heritage buildings, which guided the application of the scale in our heritage building.

The infograms performed to implement the historical-archaeological evidence scale of the *domus* are based on the information obtained in the digital 3D reconstruction of the ‘Baker’s House’ of Torreparedones [27: pending publication].

The graphic representation scale used in this study is grounded on the proposition of Pablo Aparicio and Cesar Figueiredo (Table 1) [10]. These authors proposed a historical-archaeological evidence scale of ten colours, coded with numbers. Each colour corresponds to a degree of veracity. The warmer colours show higher degrees of historical-archaeological evidence, whereas the cooler colours indicate lower levels of evidence and lower authenticity.

Table 1
Scale Depicting Historical/Archaeological Evidence [10].

1	**Imagination (Although in context, elements are imagined)**	**R120 G54 B140** **C65 M90 Y0 K0 #78358B**
2	Conjecture based on similar structures (Based on comparable element elsewhere)	R0 G79 B159 C100 M70 Y0 K0 #004F9E
3	Basic textual reference (Based on broad textual description)	R0 G139 B206 C85 M30 Y0 K0 #008ACD
4	Descriptive textual reference (Based on detailed textual description regarding dimensions, materials, colours, etc.)	R91 G197 B242 C60 M0 Y0 K0 #5BC5F1
5	Simple graphical reference (Based on simple representation in art)	R108 G190 B153 C60 M0 Y50 K0 #6CBD98
6	Detailed graphical reference (Based on detailed and objective representation in art)	R175 G202 B11 C40 M0 Y100 K0 #AFCA0A
7	Basic archaeological information or simple base plans (Based on broad evidence or plans)	R255 G229 B0 C0 M5 Y100 K0 #FFE500
8	Strong archaeological and documental evidence in photographs and detailed plans (Based on precise measurements documented in photographs and detailed plans)	R245 G160 B87 C0 M45 Y70 K0 #F5A057
9	Still existing (or partially existing) with modifications (Based on structures still existing though altered in a later stage)	R237 G108 B126 C0 M70 Y35 K0 #ED6C7D
10	Still existing in original form (Based on structures which exist to this day in their original shape)	R183 G25 B24 C20 M100 Y100 K10 #B61918

The application of the historical-archaeological evidence scale began with the search and review of documents and references related to this new trend within virtual archaeology. The next step was to determine which degree of evidence corresponded to each part of the *domus*, thus identifying a system of

reconstructive units (RU) that would help to record, with greater precision, the historical-archaeological characteristics of each element of the Roman house.

Once all the RUs were obtained, we applied the colours that corresponded to the degree of historical-archaeological evidence as is described in Figure 4.

For the application of the colour-coded scale, we used the Blender 2.90 software, and other computer programmes were used for the previous process of digital 3D reconstruction of the *domus*. Once the model was imported to Blender 2.90, the sections were carried out in the building, to ensure that, when applying the historical-archaeological evidence scale, every part of the *domus* could be observed in a single infogram (Fig. 3).

Results And Discussion

The historical-archaeological evidence scale that resulted from the *domus* of Torreparedones has 31 RUs (Fig. 4). Different RUs were used for different elements, even though they are identified with the same colour. Table 2 shows the different RUs with the historical-archaeological evidence levels of the 'Baker's House', as well as a description of the element or structure.

Table 2 Identification of the RUs and evidence levels associated with Figure 4.

RU	Evidence level	Name	Description
1	8	Elevation of the walls of the *domus*	Since the total height of the walls of the *domus* is not preserved, the work of Vitrubius was selected. It is important to take into account that the ratio relationships established by Vitrubius are approximate.
2	10	Skewback of the walls of the *domus*	The walls were built with rammed earth and *opus incertum* for the plinths, resorting to irregular bonds of limestone, which is the natural local rock, applying plaster as the final layer.
3	9	Pavement made of large stone slates	This building technique consisted in extending a bed of *opus incertum* and irregular flagstone paving, being a parallel technique to the one used in the paving of the streets of the city of Torreparedones.
4	2	Atrium cover	*Compluvium* / *impluvium* system
5	9	*Impluvium*	Square pond that gathers rainwater and discharges to the street through a canalisation system connected to a larger canalisation system.
6	8	*Impluvium* columns	First building phase of the atrium.
7	9	"A *bagnarola*" water tank	Supplied with rainwater gathered in the roofs, given its location in one of the corners of the atrium.
8	2	Latrine	The presence of a limestone slate that stands out in size in all the pavement could be an indication of the location of the latrine hole.
9	2	*Lararium*	Due to its chronology and location, it seems to correspond to a variant of the *aediculae* type, pseudoaedicular, characterised for being made of walls or a solid block, with an inner recess-like cavity, where domestic worship figurines would be placed, crowned by a gable.
10	10	Base of the *lararium*	Square structure that could correspond to the base of the recess that held the figurines for domestic worship.
11	7	Non-preserved pavement	Pavements of the *domus* that are not preserved.
12	1	Roman furniture	Roman furniture associated with each space.
13	3	Kitchen structure	Masonry structure
14	2	Cover of the southern rooms	Large gabled cover that discharges the rainwater into the *atrium* and into the street located south of the *domus*.

RU	Evidence level	Name	Description
15	1	Windows	In the Villa de las Musas (Arellano, Navarra, Spain), a window grill was discovered. The preservation of this type of elements helps in their 3D reconstruction, as well as in the calculation of the size of the hollows.
16	10	Circular base associated with the rotatory mill	Circular base of slightly over 1 m in diameter that seems to correspond to the base of a rotatory mill.
17	2	Roman rotatory mill	Formed by two hollow cones placed upside down, one over the other, with the grain remaining between the two cones and being milled by the friction between the two cones.
18	2	Cover of the storage and milling area	Spaces E-37 and E-38 consist of a hip roof that discharges rainwater into three areas: the northern area (*hortus*), the street located south of the *domus* and the street located west of the *domus.*
19	1	Access to the western area	Without archaeological evidence, it was decided to create an open door to the *hortus*, since there must have been an access in the production area to introduce the elements for their use.
20	9	Pavement of *opus signinum*	Pavement of *opus signinum* in the room identified as *cubiculum*.
21	2	Cover of the *tablinum* and *cubiculum*	The *tablinum* (E-11) and the *cubiculum* located in the northern area (E-12) consist of a shed roof that also discharges into the *atrium*, since, otherwise, the rainwater would go to the open corridor of the western area of the *domus*, where there are no canalisations or storage structures.
22	5	Parietal decoration	This type of decoration has also been found in other Roman sites. The archaeological work conducted in Beatas Street (Cartagena, Spain) recovered panels decorated with embossed motifs.
23	9	Preserved parietal decoration	Ornamental technique in which a mortar coating is repeatedly hit with a mold containing the embossed decoration. Then, the coating is covered with pure lime or mortar.
24	2	Cover of the service area	The other cover is the one that covers spaces E-22, E-23, E-24, E-26, E-28, E-31 and E-46, with a gable roof, which discharges the rainwater into the *hortus* and into the northern area of the *domus*.
25	2	Oven vault	In Augusta Emerita, an oven was recovered, which presented an access similar to the one in the *domus* of Torreparedones, consisting of a small passable entrance up to the very mouth of the oven, embedded in a square structure. Similarly, the floor of the oven preserved in Torreparedones is typologically identical to that of the bread oven of the 'Birds' House' and that of the *domus* of the Planetarium (Itálica, Seville, Spain).

RU	Evidence level	Name	Description
26	2	Oven mouth	It has a diameter of 4 m and it would have been covered by a vault, being embedded, at least in the upper part by a wall, with side openings for putting in and taking out the products to be baked and the fire wood.
27	2	Cover of the woodshed	Shed roof proposed for the closing of space E-32, identified as woodshed.
28	4	Structure designed for the sale of bakery products	Garret made of large 20cm-high slates, located in the southern half of the space.
29	2	Cover of the commercial area, redistribution area and latrine	Spaces E-15 and E-16 are composed of a gable roof, discharging, on the one hand, into the western area of the *domus*, and, on the other hand, into the eastern area. The closing of spaces E-36 and E-13 consists of a shed roof that would be the continuation of the previous cover, discharging the rainwater into the 'porch'.
30	8	Stairs	Stairs proposed for bridging the different levels of the rooms.
31	1	Vegetation	Contemporary vegetation in time and space.

RUs 1 and 2 are identified with the walls that compose the building. RU-1 corresponds to the elevation of the walls that make up the *domus*, with an evidence level 8, indicating 'strong archaeological or documentary evidence'. Since the total height of the walls is not preserved, the work of Vetrubio was considered [28], which offers approximate ratio relationships; this technique has also been used in the Roma Villa of El Saucedo [29]. On the other hand, RU-2 is related to the skewback of the walls, that is, the archaeological remains of these that are preserved. Therefore, the corresponding evidence level is maximal (level 10), as it exists according to the original.

In the archaeological excavation, pavements based on large stone slates were documented in the hall (fauces), latrine, *tabernae* and attrium. This type of construction technique consisted in extending a bed of *opus incertum* and irregular flagstone paving, being parallel to the technique used in the paving of the streets of the city of Torreparedones [30]. The pavement of the mentioned areas correspond to RU-3, with an evidence level 9, i.e., 'it exists or partially exists with modifications', as it is altered. Another type of pavement present in the building is a pavement of *opus signinum* (RU-20), located in a room identified as *cubiculum* [24]. As in the previous case, it presents an evidence level 9, due to its food state of preservation (Fig. 5). The rest of the *domus* does not present any type of paving, and, for the virtual recreation, the first technique mentioned was chosen. Thus, all the paving of the *domus*, except the two preserved types, correspond to RU-11, which presents an evidence level 7, as it is inferred that the building would have the same pavement in all areas.

Regarding the covers, these have seven RUs, all of them with an evidence level 2, since none of them are preserved; their representation is based on comparative architecture [27: pending publication, 28, 31]. The cover that corresponds to the atrium (RU-4) was proposed to be a hipped roof, since a rectangular pond was documented at the centre of the *atrium*, as well as the skewback of four columns in it [24]. Therefore, this would be a *compluvium/ impluvium* system. Secondly, the cover of the rooms in the southern area (RU-14) was proposed to be a gable roof, with the rainwater being discharged into the *atrium* and into the street located south of the *domus*. Thirdly, the covered area of storage and milling (RU-18) are composed of a hip roof that discharges the rainwater into three areas: northern area (*hortus*), the street located south of the *domus* and the street located west of the *domus*. The next cover corresponds to the *tablinum* and to the *cubiculum* located next to the *tablium* (RU-21); this cover is a shed roof that discharges into the *atrium*. The covers of the service area would be RU-24, composed of a gable rood that discharges into the *hortus* and into the northern area of the building, and another shed roof that discharges into the western street. The cover that corresponds to the woodshed (RU-27) is a shed roof that discharges into the northern area of the *domus*. Lastly, RU-29 corresponds to the cover of the commercial area and to the redistribution area and latrine. The cover of the commercial area is represented as a gable roof, discharging, on the one hand, into the western area of the *domus*, and, on the other hand, into the eastern area. The closure of the redistribution area and the latrine consists of a shed roof that would be the continuation of the previous cover, discharging the rainwater into the 'porch'.

The reconstructed *impluvium* of the *domus* (RU-5) gathered the rainwater and discharged it into the street through a canalisation system connected to a larger canalisation system [24]. It has an evidence level 9, since the structure is preserved, although it has been altered. The columns of the *impluvium* (RU-6) correspond to a first construction phase of the *atrium* [24]. Only their skewback has been documented, thus they have an evidence level 8, i.e., 'strong archaeological evidence'.

Another element present in the building is the "*a bagnarola"* water tank, which is located in the residential area, across a wall that separates the *atrium* from the *triclinium*, thus it can be inferred that it was built in a previous time (Late Roman Republic). It would be supplied with rainwater gathered in the roofs, as it is located in one of the corners of the *atrium* [25], which is a system that has been documented in other buildings, such as the *Domus* of Salvius [32]. This structure is fully preserved, although it should have a paved cover system given its location. This cover has not been documented in the excavation, associating it with an evidence level 9.

The latrine was represented in the 3D model based on the presence of a limestone slab that stands out in size among the rest of the evidence found in the pavement. According to Morena et al. [25], the difference in size could indicate the location of the latrine hole. Therefore, this RU-8 presents an evidence level 2, since comparative architecture was used for its virtual representation.

In the 'Baker's House', a square structure was identified, which would correspond to the base of the recess that would hold the domestic worship figurines [25]. This base of the *lararium* (RU-10) has the maximum evidence level (10), since it exists according to the original. The *lararium* that may have existed (RU-9),

based on its chronology and location, seems to correspond to an *aediculae* variant, i.e., pseudoaedicular [33, 34]. The virtual reconstruction achieved in the *lararium* of the 'Arucci North House' [35] helps in the interpretation of this type of lararia, serving as a basis for the representation of the *lararium* of Torreparedones. Therefore, it presents an evidence level 2, since, again, comparative architecture was used for its virtual reconstruction.

There are four RUs that have the lowest evidence level (1), that is, elements that have been reconstructed based on the historical context, such as the Roman furniture associated with each space (RU-12) and the windows proposed in the virtual reconstruction (RU-15). In the Villa de las Musas (Arellano, Navarra, Spain) a window grill was found [36]; the preservation of this type of elements helps in their 3D reconstruction, as well as in the calculation of the size of the hollows. The creation of the windows was carried out through comparative architecture, although, due to the absence of traces of such windows in the building, the minimum evidence level was assigned to it. The third RU with an evidence level 1 is the access to the western area from the street (RU-19); even without archaeological evidence, the digital reconstruction included and justified the creation of a door that allowed introducing the foods into the production area. Lastly, the crops and trees of the *domus* (RU-31), both inside and outside of the building [37, 38], were also assigned the minimum evidence level.

In the room identified as the kitchen, a masonry structure was documented, which is centred and attached in its northern facing [25]. In this context, this structure has been represented as the space for cooking (RU-13). An evidence level 3 was assigned to it, since the only information that was obtained for its reconstruction was a poorly-detailed documentary description.

The western area has a room in which a circular base of slightly over 1 m in diameter was documented (RU-16), which appears to correspond to the base of a rotatory mill [24]. This structure is preserved according to its original form (Fig. 6), thus the maximum evidence level was assigned to it (10). The rotatory mill (RU-17) reconstructed for this base was carried out by comparative architecture, thus an evidence level 2 was assigned to it. It is believed that it consisted of two hollow cones placed upside down one over the other, grinding the grain with the friction between them [39, 40].

With respect to the parietal decoration preserved (RU-23), the ornamental technique consists in a mortar coating that is repeatedly hit with a mold containing the embossed motif, and then it is covered with pure lime or mortar [24]. This technique, which is well documented [25], is only preserved in some areas of the room identified as the *tablinum* and the *cubiculum* located next to it. Since only some areas are preserved, and in an altered manner, an evidence level 9 was assigned to it. This type of decoration has also been found in other Roman sites; for instance, the excavation conducted in Beatas Street (Cartagena, Spain) recovered panels decorated with embossed motifs [41]. The digital reconstruction of the parietal decoration of the two rooms of the building of Torreparedones was carried out in its four walls (RU-22), taking into account the representations of Beatas Street in Cartagena, assigning it an evidence level 5.

The only element preserved in the bread oven that gives the *domus* its name is its floor, and two RUs are associated with it: the vault of the oven (RU-25) and the mouth of the oven (RU-26). The virtual

reconstruction of both parts was carried out by comparative architecture, which is why an evidence level 2 was assigned to it. It is 4 m in diameter and would have been covered by a vault, being embedded, at least in the front part by a wall, with side openings that would allow putting in and taking out the bakery products and the fire wood [25]. In the site of Augusta Emerita, an oven similar to that of the *domus* of Torreparedones was recovered, with a small passable entrance to the very mouth of the oven, being embedded in a square structure [42]. Similarly, the floor of the oven preserved in Torreparedones is typologically identical to the bread oven of the 'Birds' House' and to the oven of the *domus* of the Planetarium (Itálica, Seville, Spain) [43].

The room dedicated to the sale of bakery products (*tabernae*) preserves a garret composed of 20cm-high limestone slates built in the southern half of the room [25]. It could be a structure designed to place the products for sale. This structure (RU-28) is associated with an evidence level 4, since it was reconstructed based on a detailed description of it.

RU-30 corresponds to the stairs proposed in the accesses to some rooms to bridge the different levels of the rooms. These were not documented in the archaeological excavation, although the differences in the level of each space suggest strong evidence for them, which is why it was assigned an evidence level 8.

The COVID-19 pandemic has changed the lifestyle of the people, thus impacting the sites of archaeological heritage [44, 45]. Currently, new technologies are important in the communication between the heritage and the public [46, 47, 48]. Therefore, the historical-archaeological evidence scale tested in the 'Baker's House' of Torreparedones allows people to reflect on the structures of the past, observing the preserved remains *in situ*, the virtual 3D reconstruction performed and the degree of veracity of such reconstruction.

Conclusions

The representation of archaeological remains exists practically since the origin of archaeology. This study complements the most classical types of representation, computer-assisted visualisation and material archaeology, transforming the archaeological work into a scientifically verifiable infogram that is tangible for society.

This study grants value to and guarantees compliance with the principles of authenticity and scientific transparency considered for the digital 3D reconstruction of the 'Baker's House' in the archaeological site of Torreparedones. The application of a historical-archaeological evidence scale helps in the dissemination of the archaeological work carried out in the heritage building.

This work meets the scientific quality requirements established in the Seville Letter, complying with each of its 8 principles and being key for the development of the investigation. The representation of the historical-archaeological evidence scale thoroughly analyses Principle 4 of the Seville Letter: "*it must always be possible to know what is real, veracious and authentic, and what is not*". Therefore, such

graphic representation of the historical-archaeological scale in computer-assisted visualisation is key for the compliance with and attainment of this principle in any project of virtual archaeology.

Declarations

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Authors' contributions

Conceptualization, investigation, formal analysis and writing of the manuscript: I.C-C, D-F.G-M, P.T-T. Data processing I.C-C., and final review F-J.M-C and P.T-T. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

The dataset supporting the conclusions of this article is included within the article. The digital 3D model of the *Domus* is available by contacting to authors.

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Figures

1 Imagination
Although in context, elements are imagined

2 Conjecture based on similar structures
Based on comparable element elsewhere

3 Basic textual reference
Based on broad textual description

4 Descriptive textual reference
Based on detailed textual description regarding dimensions, materials, colours, etc.

5 Simple graphical reference
Based on simple representation in art

6 Detailed graphical reference
Based on detailed and objective representation in art

7 Basic archaeological information or simple base plans
Based on broad evidence or plans

8 Strong archaeological and documental evidence in photographs and detailed plans
Based on precise measurements documented in photographs and detailed plans

9 Still existing (or partially existing) with modifications
Based on structures still existing though altered in a later stage

10 Still existing in original form
Based on structures which exist to this day in their original shape

Figure 1

Escala de evidencia propuesta por P. Aparicio y C. Figueiredo [10].

Figure 2

Aerial view of the digital 3D reconstruction of the ‘Baker’s House’ at the archaeological site of Torreparedones [27: pending publication]

Figure 3

Aerial view with sections of the digital 3D reconstruction (developed by author).

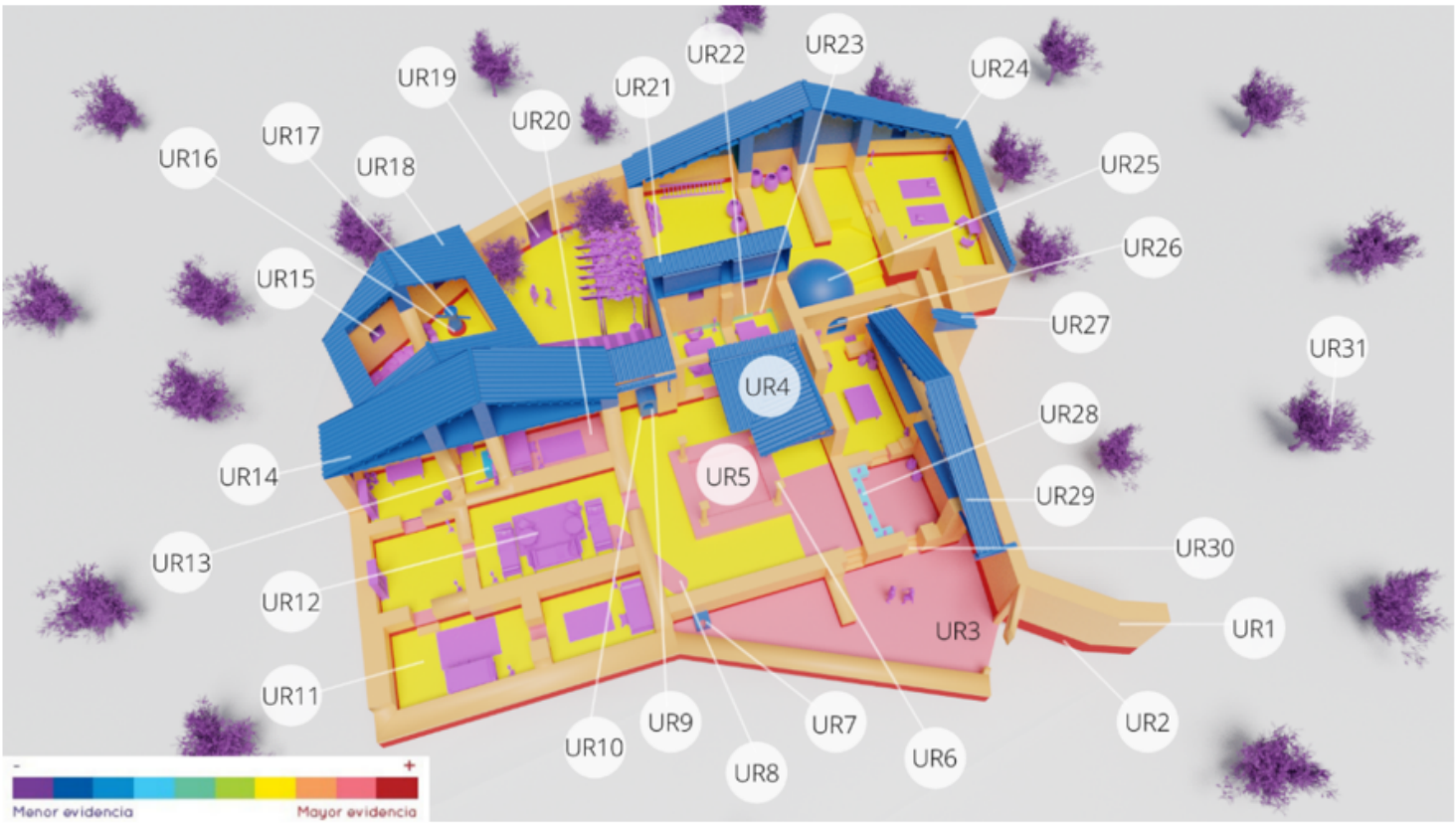

Figure 4

Infogram of the historical-archaeological evidence scale proposed for the digital reconstruction of the domus.

Figure 5

Opus signinum of RU-20 (Source: José Antonio Morena).

Figure 6

Circular base that may correspond to the rotatory mill (Source: José Antonio Morena).