

Valencian *tapia* in the walled city of Mascarell (Castellón, Spain)

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ABSTRACT: Mascarell is a small village, located in the municipality of Nules (Castellón- Spain), which has preserved the integrity of its walled perimeter. It represents a singular example of what is called *valencian tapia* (mud wall joined with bricks and plastered with lime mortar). *Tapia* has been used since ancient times. This makes dating surviving examples difficult. In Mascarell's case, the construction contract document, which is dated 1553, has been preserved. In this document, the characteristics of the works that needed to be done are described in accurate detail. The collapse of a section of the wall due to a heavy rain required restoration. This allowed a detailed study of the original building process, and the recovery of the complete skyline of the city wall. In spite of its declaration as Property of Cultural Interest in the category of 'Historic Site', and its Special Protection Planning, the Mascarell town wall has suffered a historical "slackness". All in all, this has allowed its walls to get drilled, and its moat filled, which deteriorated the original configuration.

1 INTRODUCTION

Interest in earthen architecture can be said to be relatively recent. Perhaps, you may find the first interest in the 1980's. On the one hand, under Unesco's Direction, several French scholars organized a magnificent exhibition of this material at the Pompidou Center in Paris. By then, Spain began to implement different studies, often under the impulse of its regions, special mention Navapalos encounters, which intended to show their heritage. On the other hand, it was also the time for a more scientific basis arising from the various congresses of Construction History. The technique of the wall was then the subject of several papers, which usually corresponded to restoration activities carried out in different parts of Spain and specific publications among which we should note that of Mariano Olcese Segarra, Architectures soil and adobe mud, published by the Official College of Architects of Valladolid, in 1993.

Since 1991 there is a wonderful publication on the subject in the Valencian Community: "*El tapial, una técnica constructiva milenaria*" ("The Mud Wall, an Ancient Building Technique"), by Fermin Font and Pere Hidalgo. Their work extensively deals with the development of this technique, pointing out numerous examples, mainly referred to the province of Castellón. In this province is located the ancient town of Mascarell, today Nules' hamlet. Its main feature is to be protected by a discrete wall that completely surrounds the old town.

In the late 1980's I had the opportunity to develop its Special Protection Planning and to

complete the repair of a part of the walls ruined by rain. Then I was able to read the original contract, dated 1553, for the construction of the work, which provided me with valuable information on Mascarell and its walls, which I'll try to explain below.

2 THE VALENCIAN TAPIA

Needless to say, the rammed earth technique is ancient *stricto sensu*, and it has been extended and maintained by the most diverse civilizations. In the 1st Century BC, Vitruvius already accurately described the characteristics and uses of soil available for construction. This work became true construction specifications to ensure maximum performance of a technique that, by that time, had been widely used yet.

Accurate descriptions of the procedures for obtaining maximum hardness of the walls can be found in ancient books. Descriptions included some specialization, appearing as a new vocabulary was being created.

Valencian *tapia* is mentioned for the first time by Fray Lorenzo de San Nicolas in his book "*Arte y uso de la arquitectura*" ("Art and Use of Architecture"), published in 1639. In chapter XXXV, he distinguishes several ways to make rammed earth walls out of soil. He ends up with the following paragraph:

"Valencian tapia walls are made of soil, half bricks and lime, casting alternatively layers of each material. It is very strong work".

Fray Lorenzo was well acquainted with the Vitruvius treatises, Serlio, Vignola, Palladio or Sagredo to which he devotes special attention. Obviously, none of these great writers knew about the art of valencian tapia, so to be able to understand their knowledge of its existence, we must search elsewhere. Their sources, we don't currently know, and by now the only source considered is the oral tradition, as the technique was probably described by a master mason from Valencia.

References to the valencian tapia are generously given in several contracts dating back to the 15th and 16th centuries. However, the technique was few times listed under that name. One such case would be the contract for the work made for the Capuchins of Blood signed in Valencia on March 3rd, 1597, (Galarza, Op.Cit) which specified:

"Item that the walls of the house of the monastery are to be valencian tapia of two feet and a half thick and walls from the Church and the altar to be done, namely, is that of the two sides where loaded facings, just five valencian tapia thickness and spans the front of said church of the same valencian tapia wall three feet thick and the walls of the sacristy and choir chapels of the said church should be of the same valencian tapia three feet thick".

The word tapia (rammed earth wall) is not listed in the *"Vocabulario de Términos de Arte"*



Figure 1. Section of the wall at the rebuilt in 1942 by the Dirección General de Regiones Devastadas.

(*"Vocabulary of Art Terms"*) by J. Adeline, but by his translator, José Ramón Mélida, in the publication of the work done in 1887. In it, even the term 'steely wall' is recorded, but with no specific reference to the valencian tapia, which does not appear in the manuals -Villanueva or Bails- in the use in that time.

The valencian tapia has many examples in Valencia city, like the Almudín, the Convent of the Trinity or the College of the Patriarch, as well as in many surrounding hamlets. Tapia is nowadays hidden under various repairing works, plastered, or even whitewashed. Such a situation sometimes makes identification difficult, but it was doubtlessly one of the most widely used bearing systems since the 15th century. Improvement was being done of the resistance of this ancient technique in the way it had been used until then.

In the defensive architecture of Valencian Community, rammed earth has for long been the most widely used construction technique. Mascarell is a good example to see its wide application. Its relatively good state of preservation allows the visitor to appreciate this evolution of steely wall, called valencian tapia.

3 MASCARELL VILLAGE

The loss of the municipal archives, and the scarce monograph research works on the ancient village, have not allowed the experts to establish the exact date of its foundation so far. Nevertheless, it is commonly accepted, and so it appears written in the *"Llibre dels Fets"* (*"The Facts Book"*), that Saracens expelled from Burriana by the king James I of Aragon became the first inhabitants of the settlement.

No documents prior to the Spain Reconquest have been found in which the name of Mascarell appears. Thus is supported the hypothesis of its foundation in the first half of the 13th century.

The earliest citation available for consult appears in the seventh book of the *"Décadas de la Historia de Valencia"* (*"Decades of the History of Valencia"*), written by Gaspar Escolano in 1610, in which he does a brief description of Nules and its surroundings:

"Are these the first of the town and honor of Nules that is on the royal road of Barcelona, a league from Almenara and half a league from the sea. Their homes are more than 300 Christians, surrounded by wall. It also considers villages such as Villa Vieja, with its castle, and Moncofa and Mascarell; these are next to the sea and the three gather about 250 homes, counting some of Moorish in Mascarell".

Mascarell had its own village council until 1872, when its annexation to Nules was agreed.

The first artistic evaluation of the walled assessment dates back to 1927. It can be attributable to Elías Tormo, who under the heading of Gothic Architecture in Levante's journal guide named Mascarell's walls as an example of fortification.

The Spanish Civil War caused considerable damages in the town and its walls, which were rebuilt in 1942 by the Dirección General de Regiones Devastadas, in the Ministry of Housing; they built a new school and renovated the interior of the church. Damage in the walls and numerous smashed segments framing the Door of Valencia were replaced, too.

However, the restoration of the wall did not adopt the valencian tapia system, but the layer of "valencian steely wall" -with its original bricks- was substituted by masonry. So the resulting wall was composed of a double leaf masonry made of lime mortar and cement mortar coating their outer faces, which hosted inside a mass of soil. As seen in the areas that suffered landslides, such mass was not properly compacted.

In the 1970's major reconstruction works were made, mainly on south, east and a piece of north walls. Materials used were: perforated brick—with no record on the type of fill, if any, used in its interior. Also the towers were rebuilt. They were given disproportionate battlements, whose height was well above the original, in accordance with what is said in the contract terms. The northern wall *rivellino* (little defensive tower), already has got a solid brick, castellated end, probably made along the first five decades of the 17th century.

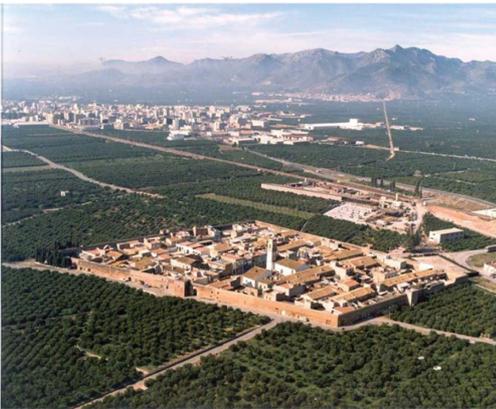


Figure 2. Mascarell (Nules, Castellón). Overview, photo GVA.

4 THE WORKS CONTRACT (1553)

A document of major importance to historical and constructive knowledge of the wall of Mascarell is its contract to carry out the work, signed in 1553. Having a specifically dated work explaining such a widely spread technique since the old times, will certainly help to verify, by comparison, other works chronology, whose date of completion has not been determined yet.

In another sense, the document clears the theory of the possible creation of the town as a "city of reconquest" in the 13th century. Several authors had claimed so, based on the appearance: its walled rectangular circuit and rammed earth wall works were common during the Muslim period.

Leaving aside any further historical details, which Mercedes Gómez-Ferrer had already analyzed, let's focus on the description of the work to be done as described in the contract.

It begins with the requirements for the foundation. It must have a width of six palms and the depth will depend on the ground features, digging down to find the right resistance. The excavation is filled with "*cal y canto*" (lime and stone). On its top, a two feet high and five-palms-thick masonry wall is raised. It will be the support for the rammed earth wall itself, which is defined as *terra y crosta* (soil and coating). Specifications on the *crosta* are given: it consists on half a brick on each side, interior and exterior, of the wall. The completion of the wall (designed to be 30 feet tall) is made of *cal y canto*. Finally, in order to give the correct slope to expel rainwater, it is indicated that such completion must be done in "*esquena de gat*" shape, making reference to the curvature of a cat's back.

Nowadays, Mascarell's wall has got the same configuration as described in the original contract.



Figure 3. Detail of the original section in the union of two rammed earth walls.

There are four ramparts with four projecting elements, of greater height, qualified as towers, or *rivellini*. In the contract, there is a reference to the existence of a scale model. This justifies the absence of other formal details, or any lack of measurements enclosed. It's true that the works were paid at a certain amount, according to an agreed template, but the length of the wall does not specifically appear in the document.

The site was closed by two doors, protected by two towers, tangentially leading towards the two side walls of the Town Hall. That is to say, the doors were not aligned along a central axis, as described by the valencian Eiximeniç ideal cities, which were organized on a more regular basis as well as a strict symmetry. The two towers stood out just above the height of the wall, and they had at the bottom three trumpet shaped embrasures, made with masonry work.

It also precisely defines the two portals, located next to the towers. They must be made of crushed stone, 12 palms wide and 16 feet high. Holes must be provided in their jambs, in order to place a bar which ensure the closing as well as improve resistance to attacks from outside.

Details describing a simple hollow are striking, moreover when no allusion to the robust hinges of hewn stone - *pollegueras*- still remaining in the portals is done.

As a curiosity, it is worth noting it's stipulated in the contract the requirement for surveillance during the execution of the works against possible attacks. One chosen person must be in charge to check that there were no dangerous enemies around the site. Important data, in a time when there were frequent attacks from the sea by the Saracen armies.

Nevertheless, the greatest interest arising from the contract document primarily lies on two issues: First, the precise dating of the work. Second, the description of the technique used to build the wall, none other than the Valencian rammed earth wall or *tapia*: "*tapia made of 'terra y crosta' (soil and coating). consisting on half a brick on each side, interior and exterior, of the wall*".

Thus, the material chosen is clearly described. And the technique was strictly taken to the practice. However, several historical events forced various repairs *a posteriori* -not all recorded-, fact that harmed the primal unity of the wall fence.

5 THE RESTORATION WORK IMPLEMENTATION

As mentioned above, in 1987 severe rainfall caused serious damage in the northern part of the wall, just between the Gate of Valencia and the northern

rivellino, exposing the rammed earth inside. Immediately, an emergency repair was done in order to prevent water to leak inside, as this should have lead to the total collapse of the wall. Repairing material was slurry lime, which appeared to have an excellent performance, as the restoration works would not begin until 2008 for several reasons.

The ruined part belonged partially to the one restored by the Dirección General de Regiones Devastadas, in which masonry replaced the *soil and coating* brick wall. It could easily be distinguished from the former part, thanks to the remains of its original construction. Similarly to other parts of the rampart, bricks barely show here.

In the restoration, we chose to use the traditional method, trying to build the five original rammed earth modules, of 3.70 m × 1.15 m, up again. The initial idea of demolishing part of the ramparts to redo some walls was completely discarded. The rammed earth wall shuttering was assembled, allowing the dumping and compacting of materials to be done. Thus, the new and the old work were united by stainless steel rods. The soil was moistened into a mixer, receiving a small supply of lime, and it was compacted by a manual rammer. The lime mortar, mixed with the soil of the place, together with a small portion of white cement to accelerate its setting, adopted a slightly pink tone. This is the color it has kept up to now. It contrasts, perhaps in excess, with the rest of the wall that would require a proper cleaning, what unfortunately was beyond the means of the job entrusted.

It was also decided -given the lack of traces left by the rods- to hide the holes left after extraction. For that, 20 × 40 mm metal parts surrounded by plastic material were used, so as they could be easily removed by slightly tapping. The small holes left after rods removal were filled with the same mortar.

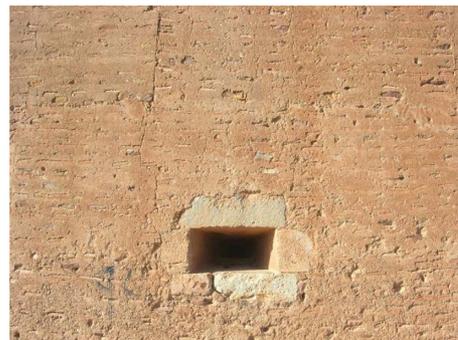


Figure 4. Aspect of the original finish on the tower of the Portal de l'Horta, with the pocket described in the contract.



Figure 5. Appearance of finished wall.



Figure 6. Detail of the wall.

The most complex issue in the works involved the placement of the tapias, as well as the scaffolding needed, on the inner part of the town. Several secondary constructions done along the time by the wall were shored up or even demolished, as they sometimes used it as a support for the beams; other times they had bitten it from inside, leaving only the outside part of the wall, which stood in miraculous balance.

The top of the wall was performed as described in the original Contract: “cal y canto” (lime and mortar), and “esquena de gat” (cat-back shaped).

6 PROJECTS IN FUTURE

There are few towns keeping their walled fence free of obstacles for its vision. This uniqueness implies a great interest by the whole complex, which must be profitably exploited: Cultural benefits, showing its important heritage; Social and Economic, too, as can be deduced from the transformation of what now is a slum inside the city.

In this context, there is a urgent need to draft a Master Plan. It must include the recovery of

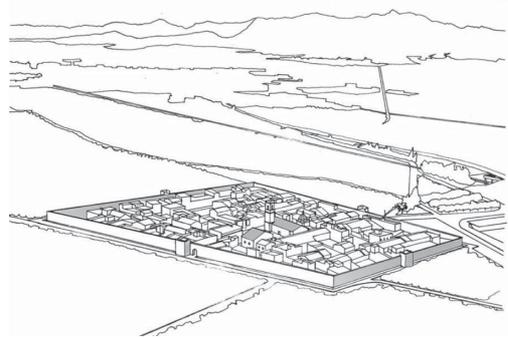


Figure 7. Aerial view of Mascarell.

the original state of the wall, the enclosure of inappropriate holes, and the replacement of unfortunate solid brick repairs done during the 1970's for a new rammed earth wall. Furthermore, access to the ravelins must be restored, replacing their stairs and removing structures using the wall as a support or penetrating the wall. It would also be necessary to recover the original level of the Portal of Valencia, by removing the current palm trees garden, and establishing an adequate lighting system. And finally, expropriations needed should be also done to comfortably implement the outside enclosure ramparts, so as the whole defensive wall could be free of obstacles to its proper visualization. This could be done with a reasonable cost for the town by creating an art and crafts school that would serve to restore this rammed earth technique. New workers could so develop the art, both to recover our heritage and to use it as an efficient construction method. It has been proved to be so along epochs, thanks to many evidences found all over the Valencian Community.

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