

## **Kos: A design for the Baths Museum**

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### **ABSTRACT**

The contribution is based on a recent survey conducted as part of a degree thesis on "The Central Baths of Kos", held at the Department DICAR the Polytechnic of Bari under the scientific direction of Prof. G. Rocco and Prof .M. Livadiotti. The proposed design of a "Museum of the Baths", to be realized in an archaeological area, therefore, is founded on a thorough preliminary historical research, the result of more than twenty years of studies of these scholars in Dodecanese (Greece).

The Museum, in a central position near the ancient agora, occupies the space of five ancient insulae south of the thermal building, ensuring its readability and creating a multi-poles museum which could be potentially replicated in the surrounding areas.

The management of the space inside the Museum takes in account the geometric ratio of the typical Hellenistic block. The choice of a wooden construction system was dictated by several considerations especially in order to the possibility of the presence of not yet investigated ruins under the new building. It was chosen therefore a system that ensures the support to the ground without damaging any ancient structures below, considering how premise of the project was the reversibility. Besides, this architectural object offers the opportunity of a better protection of archaeological sites, ensuring its study and visit.

The museum fulfills the dual purpose of collecting and exposing the architectural fragments discovered. The project of teaching materials and exhibition routes tries to make clear the complex history of the building and functioning of thermal baths, displayed in all its phases in a chronological order. In

addition, the arrangement of the exposition and every single support, panel and thematic path have been studied. The whole ensures a complete comprehension of the exposed material and of the archaeological site.

**KEYWORDS:** Archeological museum; Ancient Architecture; Monumental Baths; Installation

## 1 THE MARKINGS ON THE TERRITORY AND THE MODULAR INTERVENTION

When a project is related to an archaeological site it is always difficult to define a language capable of unifying the pre-existing and the current shape of the city.

As for the case of Kos, the remains of the great ancient architectural work coexist with a striking modern city upon which the markings of the Italian restoration work performed before the Second World War are still visible. The contribution is based on a recent survey conducted as part of a degree thesis on "The Central Baths of Kos", held at the Department DICAR the Polytechnic of Bari under the scientific direction of Prof. G. Rocco and M. Livadiotti. The proposed design of a "Museum of the Baths", to be realized in an archaeological area, therefore, is founded on a thorough preliminary historical research, the result of more than twenty years of studies of these scholars in Dodecanese (Greece). Our design intent, in continuity with the Italian preservationists strategy during the Thirties (Rocco-Livadotti, 2012), is to fit the site into a larger project of "archaeological city", a modern city that not only allows visitors to admire the ancient splendor but also ensures the preservation and the possibility for further study. The only way to properly direct future choices in this area is by establishing clear signs to point the future generations designers in one direction that will be consistent with our strategy. It is our opinion that the strongest marking that deserves preservation is the ancient urban layout. Based on the knowledge derived from the topographic study of M. Livadiotti and G. Rocco (Rocco, 2011; Rocco-Livadotti, 2012) it appears that the city of Kos, founded in 366. B.C., was based on a strong Hippodamian layout. (Figure 1).

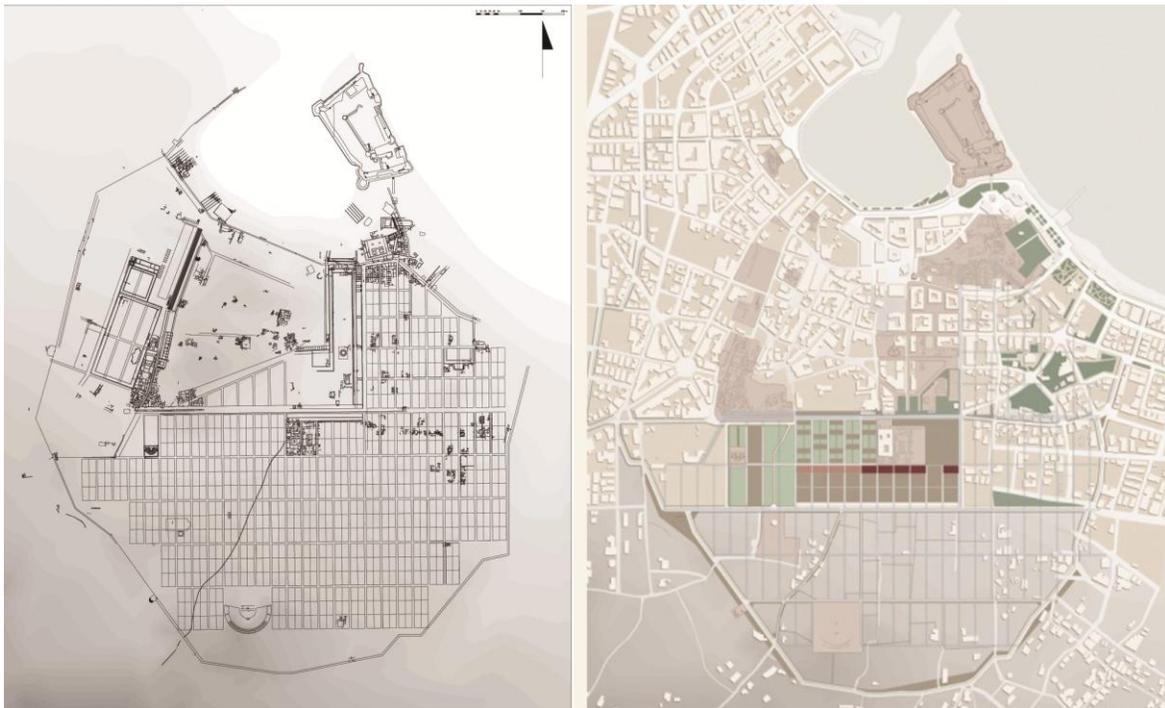


Figure 1: Comparison between the urban plan of Kos in II a.C. (drawing by M. Livadiotti and G. Rocco, ROCCO 2011) and the addition of the museum layout inside the ancient urban city plan (C. Del Sole)

The pattern we establish for the area may not be continuous but rather divided, in accordance with the dimension of the ancient blocks. By doing so it is possible to create a configuration that, in any way it is treated, can ensure a subdivision of the space, recreating the regularity that the modern city has lost. Furthermore all excavated areas will have a structure attached to them that not only allows their understanding through the addition of an educational in-depth path at the urban level, but also represent a place where artifacts discovered during the excavation can be stored and exhibited, or alternatively which may have variable functions depending on the specific needs for of the archaeological area. (Figure 1).

Caterina Del Sole

## 2 THE PROJECT AREA

The project area consists of four of the ancient blocks, on the south of the Central Baths (for Central Baths and the previous Hellenistic gymnasium ( see Livadotti 2005; Livadotti c.d.s.1; Livadotti c.d.s.2) and Casa Romana (Albertochi 1996, 2010) and those immediately adjacent to them, respectively on east and west. The intent is to create a multifunctional area where there are blocks for the function of the museum plus others reserved for services (Figure 2).

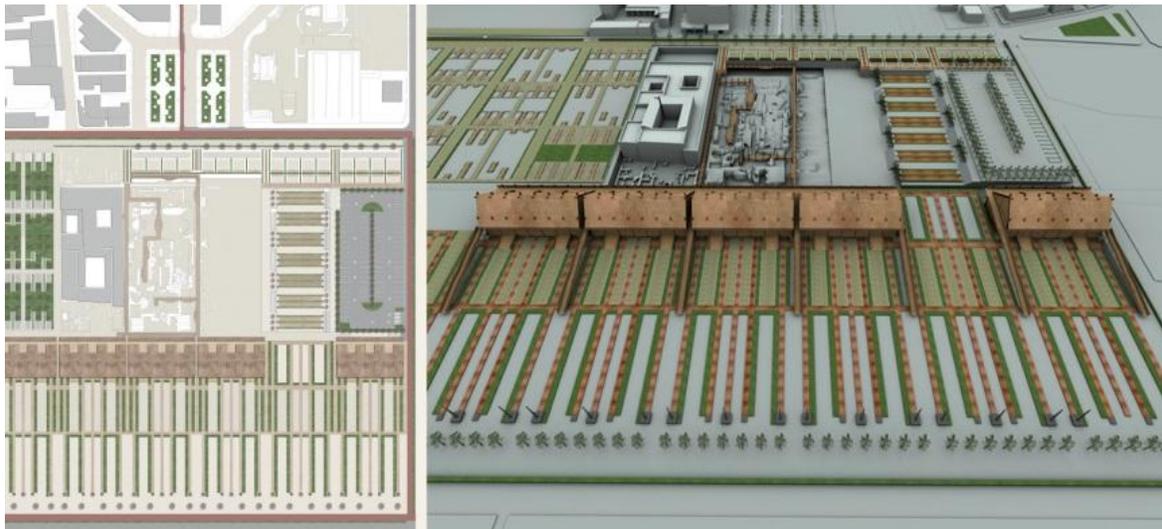


Figure 2: Detail of the museum modular blocks (M.D'Onofrio)

Retracing the intervention from East to West , we find , therefore, a large parking lot that serves the entire museum system, followed by a large terrace which allows the achievement of the archaeological excavations level , which is about 4,00 m below the modern road. At this point the visitor can choose the north path that runs along the lower part of the South Stoa leading to the entrance of the complex of Casa Romana, gaining the access to the museum of the Domus or to the circuit of suspended walkways for the visit of the site of the Central Baths or directly to the museum blocks. As the guided tour of the museum is spread from West to East , the ring closes itself to bringing the visitor back to the parking lot.

The eastern part of the project area is designed as a large square place in front of the building blocks. The arrangement of the porous green areas and paved areas, together with the choice of non-invasive species for possible underlying structures to the road surface (considered as future hypothetical case studies) are always derived from the study of the insula (Livadotti, 2004; Rocco, 2011, Livadotti c.d.s.1) and the disposition in it of its walls. To the south, the area in front of the museum was repeated in the same way the pattern of the insula and a green filter shields it from the driveway of the project.

### 3 THE PROJECT

In order to confer the project the right layout, our preferred binding aspect is the assumption of the presence, in the blocks to be build, of archaeological emergencies not investigated yet. It was therefore necessary to choose, in the world of design solutions, a system that could ensure a minimum weight on the ground and therefore reduces the risk of intercepting the ancient structures. Not only the structure must be able to perform both the function of a museum and the protection of archaeological remains, allowing both the study (major activities, cataloging and analysis of structures) and the visit. Another essential aspect in intervening on the ancient is the reversibility, which must be ensured as much as possible for the same protection of emergencies. Starting from all these considerations, the choice of a wood structural system is the only way to be able to comply with all the requirements that the case requires.

The principle of "Mediterranean" is respected in the way we get inspired by the greek way of planning: on one hand their homes did not respond to particular principles but in specialized buildings they made them monumental in size and shape. And we refer to them thinking to the structure of the long portico of the Hellenistic city, the stoai, often made of wood.

The partitioning of the space inside the museum is divided according to precise geometric rules: the main relation comes from the Hellenistic block-type. In fact, as reported by the study on the *insula* in Kos (Livadotti, 2004, Rocco 2011, Livadotti c.d.s.1) and as it appears on the thermal building situated in front of our project area, the block-type was divided lengthwise into three equal parts and transversely into two, for a total of six units. The *ratio* of the project is 1:2, and this proportion will be seeking in all the modular parts that set up the structures. (Figure 3)

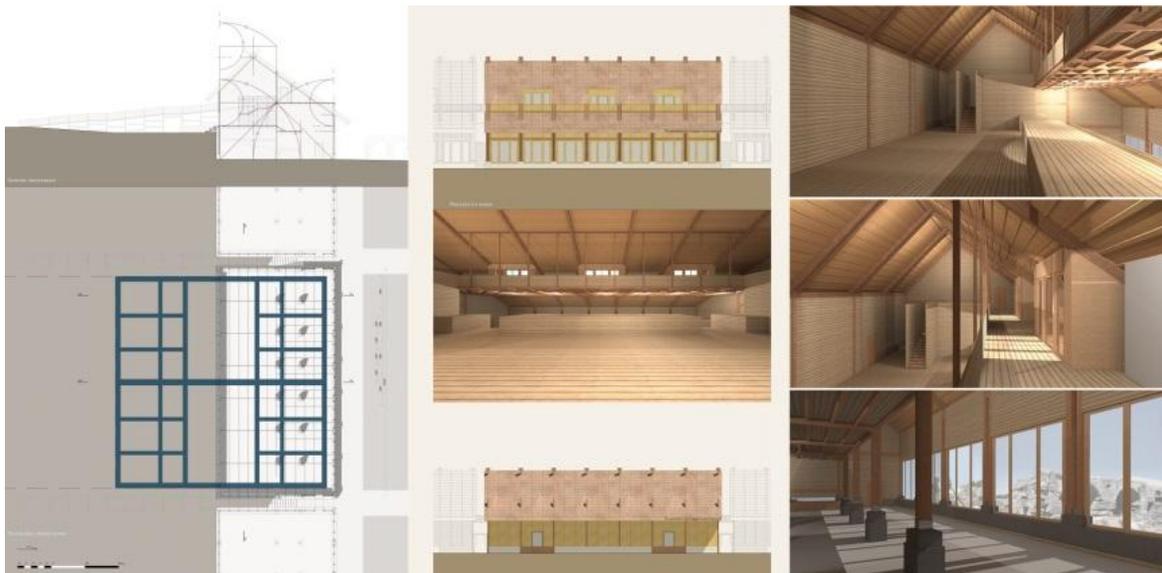


Figure 3: Detail of the geometrical rules as a starting point for the construction and prospectical (R.Gangale)

Specifically, the design approach sought to take up the concept of preservation of its ancient buildings based on the study of their shape: having to sacrifice a part of the soil of an archaeological site, we decided to provide the foundations on the streets of the perimeter of the block and where it was unlikely to intercept the underlying structures. The pace of structural section binds it to the grid of the block – type. Regarding the retaining structure, as the case of Vincenzo Latina in the construction of the Pavilion access to the excavations of the Arthemision in Syracuse (Ferrari, 2012) the design of a less

invasive system for the archaeological site and which at the same time guarantees a good response to seismic forces .

The cross section has been designed according to the guiding principle of the roof: it is made so as to be reversible as possible , referring to tectonic nodes of the Japanese construction tradition (Jodidio, 2006, Giangiam-Paolucci. 2010, Taschen et al. 2010). Geometrically it has been built considering the golden sections, “sezione aurea”, of the two squares that make up the museum. The first square is related to the existing, it is related to the extent of his direct vision internal with a balcony overlooking the excavation covered outside with a balcony overlooking the dig discovered and in it there is also a covered walkway and passage between the archaeological world and the present museum . The other square is the museum for the items to be rebuilt and linked to the educational function scheduled for the reading of the explanatory panels. The path winds on the ancient gallery , with a closer view on the museum and a wider view on the excavation.

Rossana Gangale

#### 4 THE STRUCTURE AND TECTONIC CONNECTIONS

The museum’s building structure is inspired by a tree’s branches pattern: two slanted members connected at the high point, creating a frame and vertical trunks terminating in a fork supporting the horizontal wooden beams. (Figure 4)



Figure 4: Perspective cross section showing the wooden supporting structure of the museum (V.Dario)

The pitched roof is characterized by serial elements with forked connection at the top (Toricelli et al. 2006). This connection consists of three elements, two one side and a single one meeting at the vertex and forming a hinge whose rotation is prevented by two additional wood pegs, placed horizontally, on which they fit through a slot. The sistered beams at the opposite end rest on an additional horizontal member which also serves as bracing and that fits into the pillar. Similarly, the single beam on the opposite side at its lower end engages an element shaped to fit in the pair of pillars. On this side there are bracing elements. (Figure 5b)

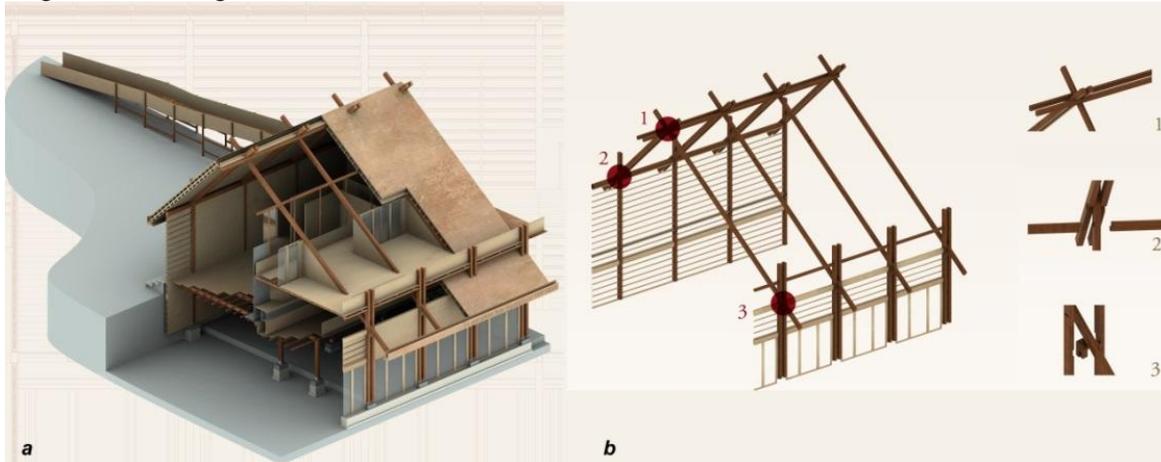


Figure 5: a. Isometric cross section; b. Detail of supporting structure's connections. (F.Stefano)

The roof structure is lightweight and independent from the underlying supporting structure, it is easy to install as it is comprised of small easily removable elements mechanically connected. The inspiration for this system came from the restoration work done in the church of Santa Cristina in Bologna (Cattean et al. 2000).

The pitched roof assembly includes, from the bottom, a secondary framing running in the longitudinal direction and connected to the main beams, a layer of plywood, upon which is installed the thermal insulation. This is closed by one more thin layer of plywood upon which a grid of sleepers support the tiles on which a copper layer is installed. At the low point, the metal is formed to become a gutter.

The wall assembly is constituted by simple vertical supports braced by wooden frames. The wall cavity is filled with thermal insulation, while the exterior face is clad in wooden slats. (Figure 5a)

The floor assembly is constituted by a main frame and a secondary frame of wooden beams, upon which plywood is installed, and floor finish. The main beams are connected to the pillars and to minor beams by fastening overlapping half-sections.

The floor of the upper level rests on one side on wall between the pillars, while the other side is supported by a system of tie-rods, in eucalyptus wood, fiber-reinforced, which are connected to a ridge, in turns fastened to the supporting structure, and at the bottom in one of the main beams of the floor that runs longitudinally on which engages the secondary frame of minor beams (Figure 6 a). Again, the reference to the use of this system is the church of Santa Cristina in Bologna. (Cattean et al. 2000)

The staircase runs in between wooden columns; and wooden stringer support the threads. The staircase is clad in wooden strips on the pillars.(Figure 6b)

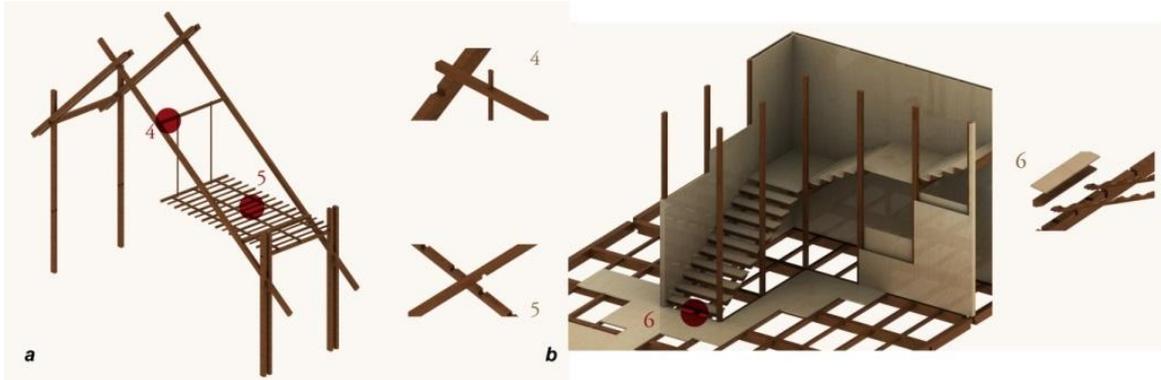


Figure 6: a. Detail of floors joints in the upper level (F.Stefano); b. Detail of the staircase's structure and connections (V.Dario)

At the basement level, the wooden column rest on a stone wall, providing the foundation to the system.

Francesca Stefano

## 5 THE INSTALLATION: CRITERIA AND SHAPES

The purpose of the museum of Terme Centrali is to collect and arrange the architectural material present in the site and to provide an education path that fulfill the complex history of the building and operation of a thermal bath, following a chronological and thematic criteria. To answer the first requirement, it was deemed appropriate to make a selection of the architectural fragments to be put on exhibit, limiting the choice to those relevant and useful to the building reconstructive hypotheses, with particular attention to the Hellenistic period, which accounts for a considerable amount of material. Some of these are located on stainless steel supports, placed on the podium between the ground zero of the large central hall and the balcony that overlooks the lower future excavations, which are configured toward the room as a support for the exposed materials, toward the gallery become a container for the materials to be stored in glass case and lapidarium. Others are placed on stands framed by the stairwells. The supports, unlike the podium that repeats itself, are specifically designed to support and properly expose each fragment, becoming the main act of the exhibition, an invitation to read and study. This would be a good point to analyze the arrangement of the material of the Gymnasium whose fragments are arranged in space in an effort to replicate the shapes and proportions of the architectural system, without making integrations in modern material but only suggesting, through their right accommodation and appropriate graphic support, the relationship between the constituent parts of the architecture of the order which they had part of. The exhibition, therefore, aims to create, through the "graphic overlay, created in space, the hypothesis integrative or reconstructive of the Monument" (Minissi, 1964) without actually in any way altering the material.

The second museum requirement is addressed by the creation of thematic paths exploring the history of the building, its forms in the succession of phases of construction, operation of plants and heating systems, the decorations. In full agreement with the modularity of the design, it was possible to articulate the paths in spaces from time to time to coordinate the needs of the exhibitions with the spatial articulation and containment devices. (Figure 7)



Figure 7: Longitudinal section and transversal with detail of the installation. (M. Masciopinto)

It is necessary to analyze the museum and its exhibition paths by examining the sequence of elements that are experienced during the visit, proceeding from the West to the East, to understand how the solutions adopted as appropriate. As a reference to the approach "didactic" of the exposures have been considered studies and composition of the Civic Archaeological Museum of Bologna and the writings and thoughts of academics such as A. Emiliani and A. Lugli.

Maria Lucia Masciopinto

### 5.1 Block 1

The first section of the trail, the ground floor is dedicated to a short introduction regarding the history of the ancient city and the excavations on the island, through panels that show old archive photos and maps. The upper gallery, from which it gets to the heart of the learning path, exposes panels that describe the function in ancient times of the gymnasiums, athletic specialties of the ancient world and an interactive map that visitors can browse by exploring the gymnasium buildings in the Mediterranean. Through the to the great central hall access is granted to the balcony below. The wooden podium is divided into a lapidarium, at zero level where it is possible to access the sub-section dedicated to Ptolemaic patronage.

### 5.2 Block 2

The second museum block sports the peculiar feature of a direct view over the residence known as Casa Romana (Albertocchi, 1996 / 2010). The first part of the journey relates to the building and tells the story and shape through panels placed in the niches in the upper gallery and exterior panels. On the lower level the visit resumes with the original statues of athletes and fragments of the architectural orders.

### 5.3 Block 3

The visit continues with an introduction to the thermal buildings, an extensive documentation with historic photographs of the site of the Central Baths and the exposure of the relief of the surviving structures. The 4 thermal phases are described in the multimedia room, in ways similar to the interactive map of gymnasia, you can browse the maps of the Roman Empire and the main thermal buildings. From the balcony below you can view a large collection of fragments of colorful marbles theca used in surface coverings of the Baths. The podium of the great hall hosts a collection of architectural fragments of the decoration of the Baths and a Roman statue of Hercules. The stairwells contain two scale models of the thermal building, useful for the understanding of space and of the sequence of rooms and internal paths. The terrace looks out directly on the excavation object of study. The plan are explained in detail through panels arranged outside that guide the visitor in identifying the surviving structures.

### 5.4 Block 4

The fourth and last block of the museum is the most "didactic" of the entire complex: inside it is possible to understand, through panels and scale models, the working of the system that allow the heating of air water and its supply of ponds and fountains in the Roman Baths. Upstairs, in the glass gallery, more educational panels are exposed illustrating the thermal rooms and their characteristic shapes; the podium of the lower gallery, which always overlooks the ancient structures below, contains showcases with special bricks for the conduction of water and panels that explain the operation; the large central hall is dedicated to heating systems and air convection, with display of other special bricks founded near the building being analyzed.

Valerio Dario

## 6 CONCLUSION

The Baths Museum enters within the debate about the link between design project and the comprehension, valorization and conservation of the cultural heritage, mostly the archaeological one.

The modern city of Kos shows how such a deep stratification of historical artifacts should provide the design and planning of a building which should belong to the whole complexity of the actual city, which is both ancient and contemporary.

The rectangular grid upon which the ancient city was planned on, makes true the previous concept and so it can be applied also on other cities with a similar ancient planning, or on cities deriving from ancient roman castra.

Spatiality, geometrical regularity and modularity are characteristics that are owned by both the Museum design and the whole city planning.

The Museum tries to give a solution also to problems linked to the conservation of historical heritage. Digging in a city with plenty of archaeological artifacts brings to issues linked to the modern urbanization of spaces. What is found during excavation should be protected and conserved, in order to be studied in future.

The concept of the reversibility, upon which is based the use of wood structures, is also extremely important.

The final design of the Baths Museum shows all of these principles. This building wants to be a place where to display archaeological artifacts belonging to the Central Baths area, and shown in a didactic path which explains the real operation of a thermal complex.

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