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# TRADITIONAL TECHNIQUES AND INNOVATIONS IN THE DESIGN OF RESIDENTIAL BUILDINGS IN DAMASCUS DURING THE FRENCH MANDATE

*The architecture of Syria, on whose territory dozens of civilizations and states have arisen and died for many centuries, is a complex and distinctive phenomenon. In the architecture of Damascus in the first half of the 20th century, the centuries-old traditions of Syrian architecture were intertwined with new European methods of constructive-technological, functional-planning and artistic solutions of buildings for the country.*

*The article examines the building materials used in Damascus building practices and the methods of their manufacture during the French Mandate (1920–1946) and also the article talks about constructive and technical construction methods, which characterized Damascus as a connecting link between East and West.*

*Damascus' traditional dwelling retained its architectural and building elements until the mid-19th century, when Western influences began to emerge. First of all, this is clearly revealed in the expansion of the city, the organization of new districts. During this period (1839–1854) Ottoman building codes were in force. During the period of the French Mandate, European influence increased and spread also in the field of applied structures and building materials. Cement and concrete were introduced, which were produced in local enterprises, and iron elements, which were imported.*

*The purpose of this article is to study and analyze traditional methods and innovations in the constructive and technical solution of residential buildings in Damascus during the period of the French Mandate, to determine the nature of the influence of European architecture.*

**Keywords:** *Damascus, residential buildings, the French Mandate, European architecture, construction technologies, construction material*

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# ТРАДИЦИОННЫЕ ПРИЕМЫ И НОВАЦИИ В КОНСТРУКТИВНОМ РЕШЕНИИ ЖИЛЫХ ЗДАНИЙ ДАМАСКА ПЕРИОДА ФРАНЦУЗСКОГО МАНДАТА

*Архитектура Сирии, на территории которой на протяжении многих веков зарождались и исчезали десятки цивилизаций и государств, представляет собой сложное и самобытное явление. В архитектуре Дамаска первой половины XX в. переплелись многовековые традиции сирийского зодчества с новыми европейскими приемами конструктивно-технологического, функционально-планировочного и художественного решения зданий.*

*Автором исследованы строительные материалы, применяемые в дамасской строительной практике, и методы их изготовления в период Французского мандата (1920–1946 гг.). Конструктивно-технические приемы строительства характеризуют Дамаск как связующее звено между Востоком и Западом.*

*Традиционное жилище Дамаска сохраняло свои архитектурные и строительные элементы до середины XIX в. (период активного влияния Запада), в первую очередь это наблюдается в расширении города и в устройстве новых районов. В течение этого периода (1839–1854 гг.) действовали османские строительные нормы. Во время Французского мандата европейское влияние возросло и распространилось в области применяемых конструкций и строительных материалов. Был введен цемент, который производился на местных предприятиях, а также бетон и железные элементы, которые импортировались.*

*Цель данной статьи — изучить и проанализировать традиционные методы и инновации в конструктивно-техническом решении жилых зданий Дамаска в период Французского мандата, определить характер влияния европейской архитектуры.*

**Ключевые слова:** *Дамаск, жилые дома, Французский мандат, европейская архитектура, строительные технологии, строительные материалы*

From the point of view of the evolution of structural schemes, two groups of building technologies, structural schemes and building materials used by local architects of Damascus during the French Mandate can be distinguished. The first includes traditional designs that became widespread at the end of the Ottoman period. The second includes new constructions from the period of the French Mandate.

Considering changes in traditional space-planning and structural schemes, it is necessary to distinguish two stages in the formation of the structural scheme of a building:

First stage. Acquaintance with constructive forms of European architecture that are new to Syria. The influence of Western culture was minimal until the second half of the 19th century. This was largely facilitated by the process of accumulating knowledge about European architecture by local architects, as well as the possibility of producing and distributing new building materials.

Second stage. The period of the French Mandate is a time of transition to new building materials and constructive solutions under the influence of European traditions.

The fairly long first stage refers to the end of the Ottoman period — the end of the 19th — first quarter of the 20th centuries.

During the Ottoman period, construction was dependent on the availability of materials in the construction area, especially when they were difficult to transport. Damascus architecture during this period did not rely heavily on stone due to the distant location of the quarry sites and the increased cost due to delivery.

Damascus's location in the green-rich Ghouta region (Damascus' forested area) offered certain building materials. At that time, they did not yet know cement, and Damascus builders used local building materials found in the region: "silsal ardi" (in Arabic black clay) and "khudua al-khor" (in Arabic "poplar tree") (*Milnik* 2007: 67).

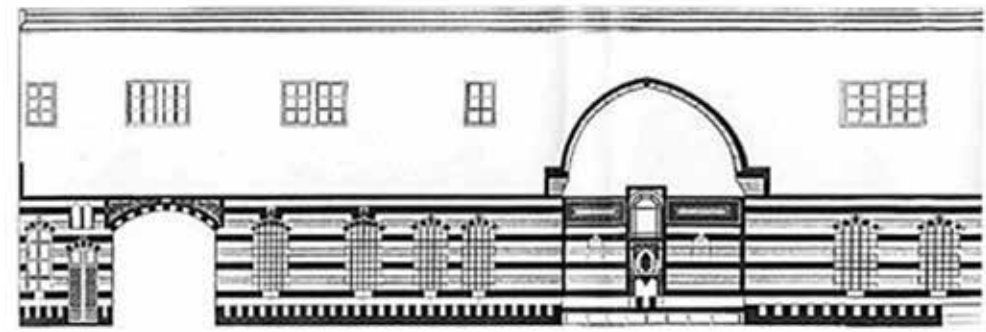
The main construction material was clay, with the inclusion of wood for the ceiling slabs, framing beams and braces.

The clay from which the raw brick was made was mined from the bed of the Barada River. Along with clay, stone (various types of marble, limestone) was used, from which the walls of the first floor were built. During the Ottoman period, the economic situation of the inhabitants of Damascus improves, taxes are reduced, and the wealthiest citizens begin to build higher stone walls of their houses, as the desire to create a house resembling a fortress increases (il. 1–4).

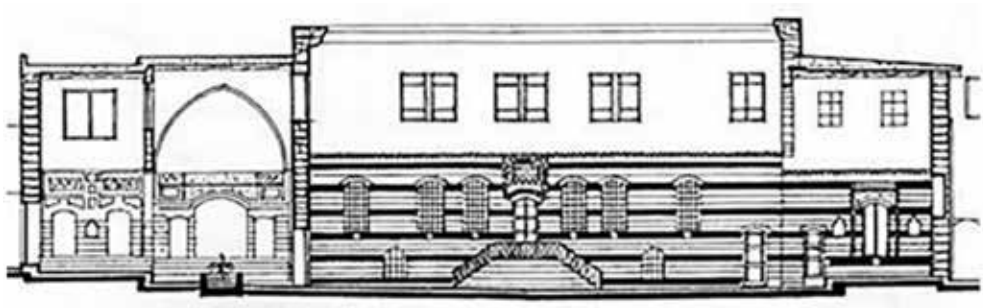
The walls were most often laid of stone at the level of the first floor, in a more humid place and had a thickness of 60 to 100 cm with a floor height of up to 5 meters in buildings, and the upper floors could be made of raw bricks with the addition of structures made of mulberry and poplar, which was in abundance. The walls of the second floor were made of a wooden frame filled with raw bricks, laid at an angle of 45 degrees, the thickness of such walls was less than 40–60 cm. They were covered with a limestone composition (*Abdulrahman* 1994: 18).

There were two types of masonry in the construction of the first floor of Damascus buildings:

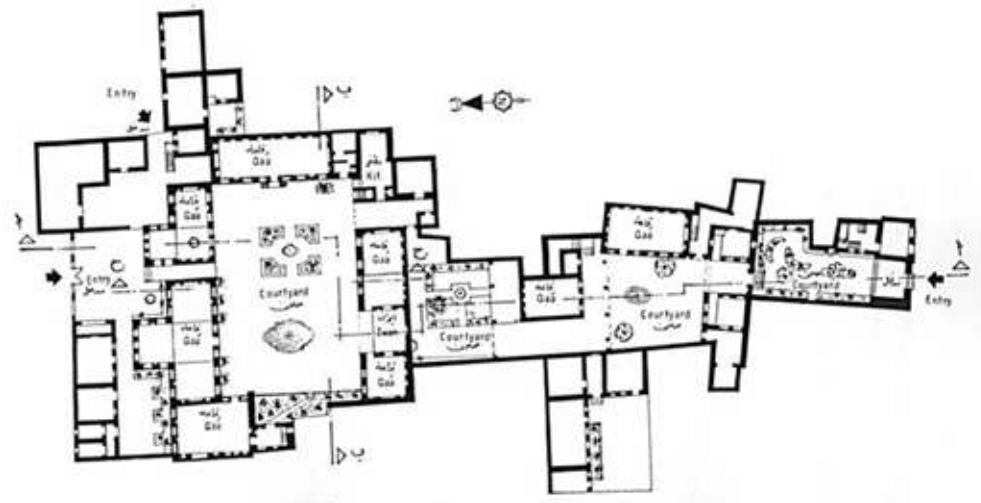
The first type is raw brick masonry (basalt stone foundations, on top of which raw brick masonry was made, covered with a layer of plaster). The second type is a wooden formwork filled with stones mixed with clay on a basalt base (15 × 25 cm). To escape the heat,



*Il. 1. Interior facade of the house of Khalid Al-Azem (Кибрит 2000)*



*Il. 2. The section of the house of Khalid Al-Azem B-B (Кибрит 2000)*




*Il. 3. House plan of Khalid Al-Azem in the late period of Ottoman (Кибрит 2000)*

*Il. 4. Photo gallery of the house of Khalid Al-Azem (photo credit H. Abass, 2018)*

the ceilings are made high, at the same time this affected the humidity of the premises, so fountains were used. Flat roofs were covered with clay on wooden beams (il. 5).

At the end of Ottoman period, traditional building materials continued to be used, but new building materials such as iron profiled beams were added, which were used in the floor system, and thus wooden beams became less used (*Atfa* 1984: 22).

The second stage — the Period of the French Mandate — is the time of transition to new building materials and constructive solutions under the influence of European traditions.

The buildings of this period are distinguished by a small degree of modification of European components, which on the hand, reflects a gradual increase in the number of professional architects in the

area, and on the other hand, the degree of integration of European culture in social consciousness. In addition, buildings are seen with examples of deliberate synthesis of Western and classical building components, as well as their interpretation and integration, which gives off an excuse to talk about the professionalism of designers and the increased level of awareness among clients (*Dogman* 1999: 39).

In addition to borrowing a fresh typology, Western system materials were actively adopted. For the most part, this was explained by their technological effectiveness, which made it possible to build structures in a shorter time, and also by their strength features. At the initial steps, they were built into the constructive schemes familiar to the regional architecture, which were often combined with classical materials.

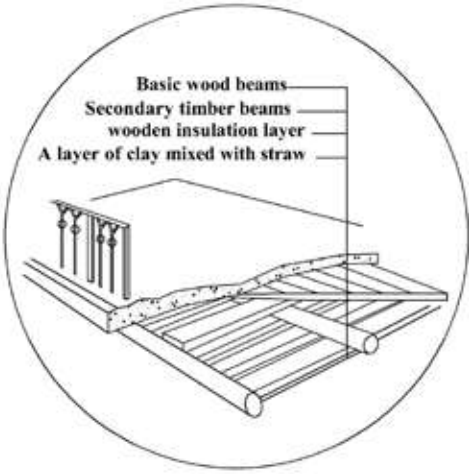
The most used adherents of this group are the components of the floors, exposed by reinforced concrete and metal systems, which soon changed the classic wood ones.

Objects produced under the guidance of professional architects who received a foreign or Europeanized education, stood out literally by the absolute copying of Western methods of active organization of space. The introduction of fresh structural materials hoped the formation of the technological base of the megalopolis, which was expressed in the fact that at the beginning they were brought into the area from abroad, before that they had established their local factories of construction materials (*Dogman* 1999: 40).

The most important French companies exporting building materials and construction technologies to Syria and Lebanon before First World War.

1 — Lenter prise des Routensen Syrie (road construction, irrigation, hydraulic works).

2 — CRUPPI (road construction works).




*Il. 5. Traditional constructive isometric section (scheme credit H. Abass)*

3 — PILLET (construction and cement production).

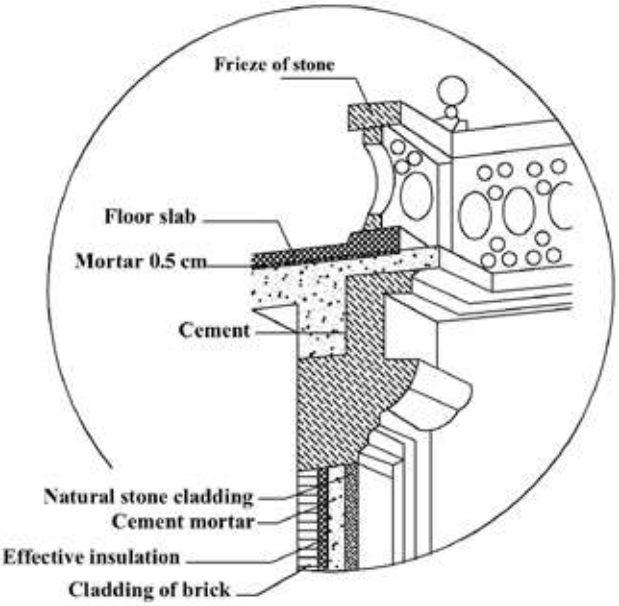
Syria continued to import construction materials through Beirut on a rail line connecting major cities until a cement plant was established in Damascus.

Thus, we can see the huge amount of modern materials that were required by law to be used. These materials were reflected on the urban structure of Damascus (*Dogman* 1999: 41).

The cement construction method was widespread after the construction of the first cement plant in the Damar region in 1929. Concrete and reinforced concrete have become new materials for the construction of multi-storey buildings.

Period of the French Mandate. In almost all types of buildings, two methods of roofing are combined: the old one — pitched roofs and the new one — flat operated roofs. The load-bearing walls were mainly made of stone and were made 50 cm thick.

New building structures and materials from the period of the French Mandate — reinforced concrete columns and floor




*Il. 6. Section through the wall, showing the layers of building materials in French Mandate period (scheme credit H. Abass)*

beams, internal walls made of block material.

Reinforced concrete and iron systems became widespread, which began to be used in more difficult joints and in ceilings. With this, the design schemes continued to be based on the developments of the conventional architecture (*Pascual* 1980: 28).

With the integration of European architecture into the buildings of Damascus, as well as the improvement of the material and technical base, the process of a complete transition to Europeanized building materials began, followed by a gradual transition to frame and wall reinforced concrete systems taken from Western examples. At times, the constructive schemes taken almost completely changed the classical ones (il. 6, 7).

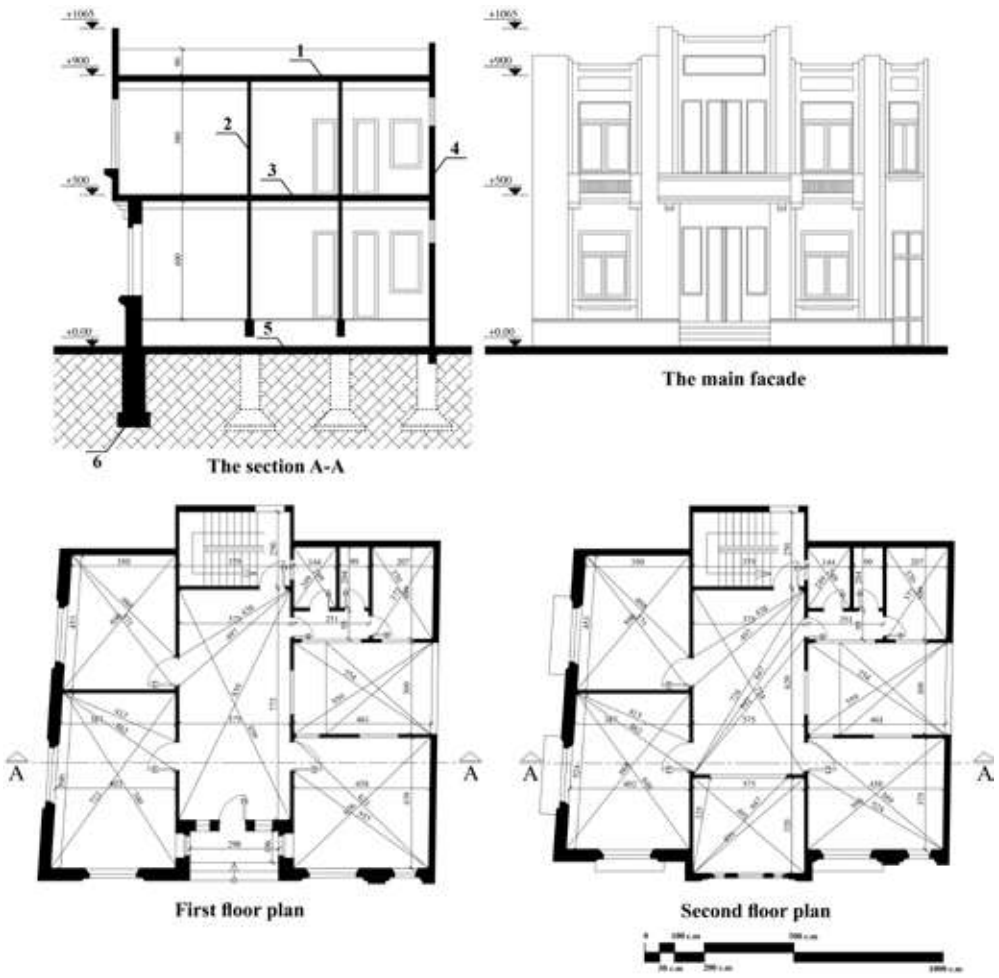
At the end of the French Mandate period — 1943 and 1945 — in the critical political, military and economic conditions experienced by Syria in general and Damascus in particular, it was noticed that the approved rules continued to be in force, the volume of construction decreased, and the cost of construction became high.

The space of the premises has increased due to the use of reinforced concrete and metal elements, and the height of the premises has relatively increased due to the multi-storey structure.

Stone in various forms has been used as the main material in the construction of buildings for the outer walls. Concrete columns are used indoors, while cement blocks or masonry are used as partitions.

Reinforced concrete was used to create roofs in general, and iron bars were used to create the roof. This was followed by the reinforced concrete roof structure when the hollow block (Hurdy) was used. The staircase is made of reinforced concrete, due to which a varied shape of stairs has appeared (*Kher* 1982: 12).

The refusal to include a courtyard in the layout of houses, lead to unified layouts for all climatic conditions in line with



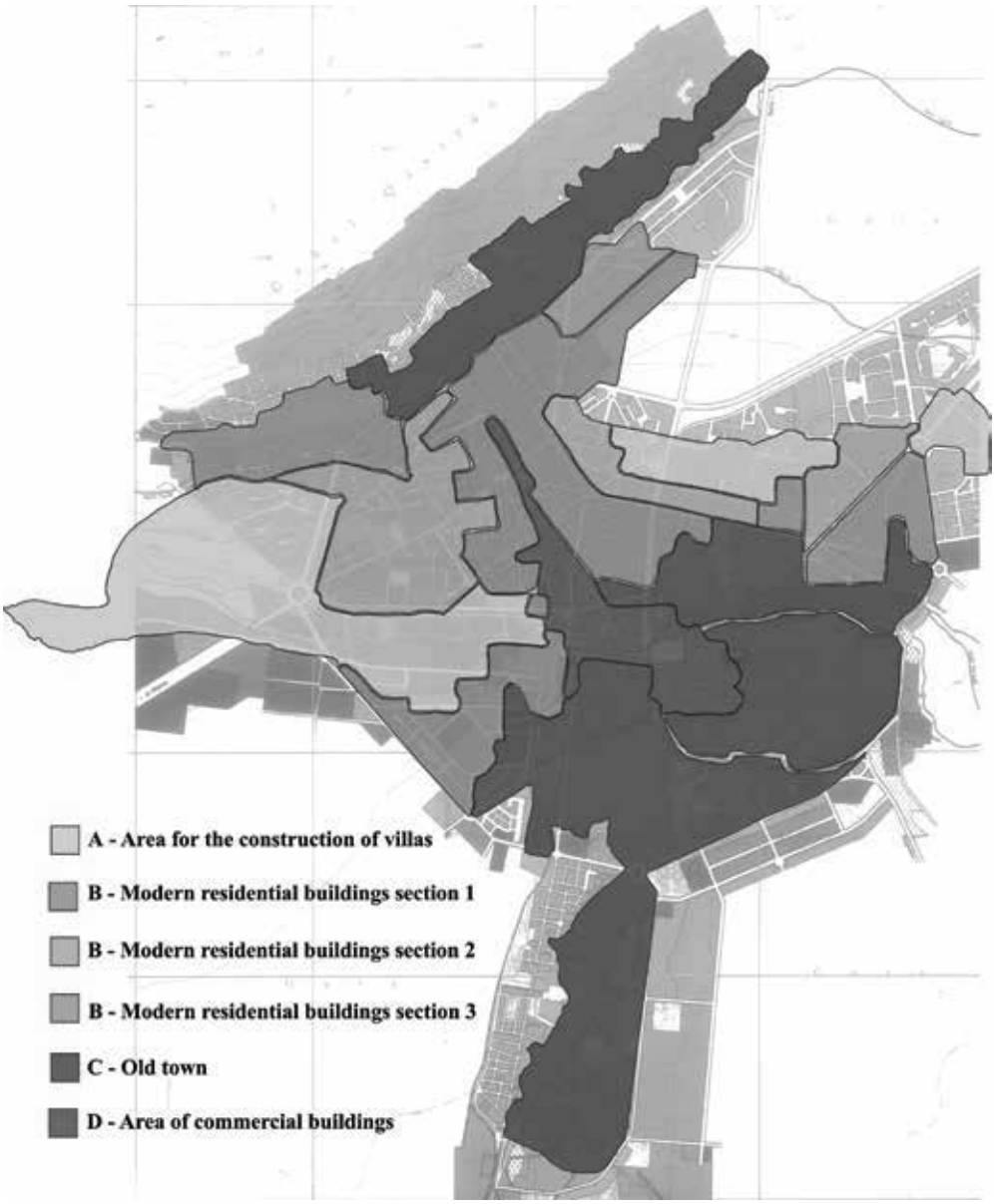

*Il. 7. Residential house plans in French Mandate period (scheme credit H. Abass)*

modernist tendencies. More actively used engineering equipment for heating and cooling air, ventilation. It is often more expensive or less effective, and it can sometimes be unhealthy.

The high construction costs and high maintenance costs of streets and parks were accompanied by a simplification of the shape of buildings and their decoration at the end of the period, as well as the abandonment of most types of traditional decorations and architectural elements that appeared at the beginning of the period.

In accordance with the construction system issued by the Prime Minister on September 1, 1930 (*Decree* no. 2390), New houses and all their departments must be built in such a way that they do not categorically harm the safety or health of their residents, as well as the safety and health of neighbors. passing along the main street (*Hety* 1982: 33).

The thickness of the existing walls around the building or walls separating the




*Il. 8. Conditional zones of Damascus during the period of the French Mandate, according to the construction law of 1930 (scheme credit H. Abass)*

premises prepared for day and night living and outside the building must be at least fifty centimeters in the basement and forty centimeters on the upper floors, taking into account the air gap, if any, and without calculating the thickness that covers the walls.

Horizontal surfaces must be covered with materials that do not transmit heat,

and the thickness of the roof slope should not exceed 25 cm.

Damascus was divided during the period of the French mandate into conditional zones, in accordance with the law of 1930: Zone A — intended for the construction of villas. Zone B — intended for the construction of modern residential buildings and is divided into three sections. Zone C — includes the old town. Zone B is the territory of commercial buildings.

In which the possible structures, construction materials, building area, and the height of the structure were determined (il. 8).

In zone A — it is forbidden to use all materials, except for stone, brick and concrete, for the construction of internal and external walls and their foundations.

For walls, you can use only cement mortar made of sand, lime and cement, you cannot use clay, you can cover the walls with plaster. It is unacceptable to use wood of all types, except for windows and doors. Roofs should be constructed of concrete, covered with waterproof materials such as tiles, with raised ends on the walls of the façade, provided they have a sufficient slope to prevent water accumulation.

These provisions shall apply strictly to the repair or renovation of all buildings prior to the publication date of this decision, including renovations and extensions. If the strength of the section of the building on which the new building is to be built is insufficient to accommodate the aforementioned new building, the searched section must be demolished and rebuilt in accordance with the aforementioned rules (*Shelcher* 1998: 56).

In zone B — the rules specified in point A apply only to facades, roofs of new buildings must be covered with cement and available thermal insulation materials must be used.

In zone C — Building owners have the option to use any building materials they want.

In zone D — It is prohibited to use building materials such as wood and libn (adobe) in the construction of walls and ceilings. Only stone is allowed on the facades of buildings, and these walls must be covered with stone or well-made paint.

As a result, based on the documentary and analytical study of housing development in the city of Damascus, it is noticed that:

– There is a rapid change in the course of this development, helped by construction regulations and laws, the introduction of building materials, construction methods and European influences on the housing schemes, the change in the social, economic and technical structure in the Damascus region and the rest of the regions.

– The image of the buildings from the period of the French Mandate in Damascus are still obvious, but in a situation that requires sufficient study to preserve and develop them after knowing the most important causes of these changes and focusing on protection techniques and methods of rebuilding with suitable materials.

– Currently, processes of further urbanization and industrialization are taking place in Syria due to the faster growth of construction, the density of buildings is increasing, which, in turn, poses new challenges for architects, the solution of which should be closely related to the culture and traditions of the city.

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