Traditional Syrian Architecture
CORPUS Levant

CORPUS Levant is a consortium between:

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To each one of the Syrian families whom nobility has permitted the birth of this little tribute to the traditional architecture of Syria.

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Traditional Syrian Architecture

General Direction of Antiquities and Museums of Syria

Ecole d'Avignon

Col·legi d'Aparelladors i Arquitectes Tècnics de Barcelona
The house was the first human production. It initialized the first settlements. At the dawn of times, man sought a private space to accommodate his daily needs from the moment he took shelter in a cave. He developed his dwelling to suit his requests, using the building materials in his nearest surroundings. Throughout history, the human residence improved, growing more and more sophisticated with the emergence of new needs. Architectural diversity is thus an answer to the wide array of daily needs and activities.

The Mediterranean area is distinguished by a similar traditional residential architecture throughout its vast territories, telling the long story of the cultural intermingling that has forged the area since antiquity. Similar environments, climates and social conditions played a crucial role, affecting architecture, making it a direct and clear consequence, a testimony of their roots. From an artistic and cultural point of view, this residential architecture, which may seem modest and simple, is worthy of praise and admiration. It must be registered and acknowledged to secure its conservation, and transmitted to the generations to come.

The urban fabric in most of the Syrian cities that lived, flourished, and developed in the past, is still very much alive today, distinguishing itself through its intimacy and density. It plays with spaces and volumes, shade and light... roads wind between residences, narrowing as they shift from public to private areas. Private spaces open onto an inside courtyard, allowing for a restrained amount sun to come in, ensuring the right amount of ventilation in hot summers. In the villages where lands stretch outwards, the house extends horizontally.

The urban fabric in Damascus, Aleppo and Bosra is registered on list of world heritage, acknowledging the importance of traditional residential architecture. It is henceforth recognized as an equal to historical monuments. This urban fabric is in the immediate surroundings of historical monuments, blending to create a harmonized conglomeration of culture. Other towns and villages also have their own particular and characteristic residential architecture, made by simple people to serve daily needs. These builders and users have exploited the locally available building materials and the construction techniques they inherited from thousands of years of civilization. Alas, today, after having survived the tides of history, this architecture it is now threatened by annihilation.

The project which seeks to preserve this traditional architecture is the fruit of an Arab-European co-operation throughout the Mediterranean area. It is supported and financed by the European Union, especially France and Spain, to strengthen the cultural message and depth of the historical and cultural ties between nations. This project focuses on Syrian traditional architecture and aims at:

- Contributing to the preservation of local traditional architecture, which is an Arabic heritage with a distinguished character. It is often subject to vanishing due to works of reconstruction or change in use, threatened by the inevitable operations wished and implemented by inhabitants to improve their living conditions. It is therefore a duty to rehabilitate these buildings, and train the persons in charge of these operations, whether they are local authorities, architects, craftsmen or above all the inhabitants themselves, as they are the main actors and target of the project.

- Raising awareness on the importance of ordinary Arabic architectural heritage and its evolution, and promoting it among the general public, to trigger a change in the perception of this heritage, and to consequently sustain cultural tourism.

- Casting a new light on the diversity of Syrian architecture and its expanse through the many Syrian regions, encouraging a new awareness of this aspect of Arab identity.

- Building up experience in architectural heritage management, helping to set up a legislation to protect it against the growing complexity of modern life, and rehabilitating it to answer the modern needs of its inhabitants.

Dr. Tammam FAKOUCH

Director-General of Antiquities and Museums of the Syrian Arab Republic
Introduction

This book is the fruit of the CORPUS LEVANT network, it is a constituent of the Euromed Heritage program (1), at the very heart of the MEDA (2) area. Lebanon and Syria now complete and extend the work already accomplished by 13 other Mediterranean countries that took part in the CORPUS project: a considerable database on architectural heritage, which can be consulted on the Internet at www.meda-corpus.net, and in a book, “Traditional Mediterranean Architecture”.

Complete, as the Mediterranean area concerned is now one long and continuous stretch of land on its Oriental bank. Extend, as the Arabic language has now appeared amongst the documentation collected, and especially now that, alongside research, newer and more operational tools have been created: two touring exhibits support and sustain an awareness campaign addressed to the general public throughout the Lebanese and Syrian territories; a manual for the maintenance and rehabilitation of traditional architecture, conceived to guide inhabitants, men of the art and architects in their work.

For the past 40 years or so, an accelerated homogenization process has affected the stock of traditional architecture, causing a progressive disappearing of all the specific characteristics of its origins and justification. This is why the house found in a village, town or city, its roots and persistence as well as its current shapes, is once again at the heart of our study: an art of living and dwelling. Traditional architecture has its strong characteristics: it can be basic, domestic, or pre-industrial in its concept, but it is almost always conceived by men of the art rather than architects, implemented using local know-how, materials and traditions, according to ancestral shapes and technologies.

CORPUS LEVANT, thanks to the participation of these two countries, is therefore a considerable added value to the database of architectural typologies, remarkable sites and building arts. Beyond the mere knowledge recorded and organized on the CD-ROM and the Internet site, this new project is resolutely turned towards a practical and operational rehabilitation manual. A manual made to arouse interest and awareness, designed to bring simple and illustrated answers to concrete problems through about 60 technical files, addressed to the actors who are best placed to maintain this unacknowledged, paperless architecture. Our objective: to promote positive rehabilitation, a rehabilitation that preserves, adapts and improves architecture without betraying its essence or threatening its very existence.

Gilles Nourissier
CORPUS Levant network coordinator

(1) EUROMED HERITAGE is the first cultural program of a Euro-Mediterranean partnership which aims at exploring the array of patrimony and heritage in its wider definition and extent. The heritage studied is considered through its various identity aspects as well as through its economic weight, as a potential actor for activity, wealth and growth.

(2) MEDA is a space, a wide area of neighbouring Mediterranean and European Union countries that have generated an ensemble of operational programs. MEDA is the tool of an ambitious initiative aiming at creating durable and strong ties between the Northern, Southern, and Eastern banks of the Mediterranean.

(3) CORPUS is an acronym: CONstruction - Rehabilitation - Patrimony - USE. This acronym reminds us of the essence of our mission: we are dealing with building arts, with deteriorated yet current architecture, with ancient cultural values, with a useful and inhabited architecture. The word is both an acronym and a noun designating “a set or collection of texts and documents produced by a tradition were gathered for a study” (Larousse dictionary).
# Traditional Syrian Architecture

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Territory and Habitat

Physical Features

Syria lies on the eastern coast of the Mediterranean Sea, bounded by Turkey in the north, Iraq in the east, Jordan in the south and Lebanon and the Mediterranean Sea in the west. The Syrian territory is divided into four geographical regions: coast, mountain, inside and desert regions, and administratively into 14 governorates that are divided into smaller local administrations; the village is the smallest administrative unit. Syria has 6 million hectares of cultivated lands; the remaining areas are desert and rocky mountains.

The overall area of Syria is 185,180 km² and the number of Syrian citizens registered at the end of 1999 was 17,460,000 inhabitants. The average density of the population is about 87 inhabitants per km² and the ratio of urban population out of the overall population is close to 50%.

Syria enjoys the climate that generally prevails in Mediterranean regions; cold rainy winters and dry, hot summers, separated by two short transitional seasons. Heights above sea level vary from 10 m high in the City of Lattakia to 1,500 m above sea level in the city of Bloudan, near Damascus.

The coastal region is characterized by heavy rainfall in winter, moderate temperatures and relatively high humidity in summer. The interior region is characterized by rainy winters, and hot and dry summer. The daily temperature differences, from maximum to minimum are high. The area in the mountains is 1,000 m high or more, it is characterized by rainy winters where rainfalls may exceed 1,000 mm and a moderate climate in summer. The desert region is characterized by small rainfalls in winter and hot and dry summers.
People

The great diversity of the Syrian landscape—hills, valleys, steppe and desert—have continuously sheltered a variety of peoples with different religions and languages: many civilizations and big empires have left their marks upon Syria. This diversity is both a result and a cause of its physical geographical aspects and its history. In some areas of Syria, Assyrians have kept their customs, lifestyles and original language. In Maaloula, for example, inhabitants still use Aramean, the language spoken by Jesus Christ.

Arabs make up the overwhelming majority of the Syrian population, though there are large minorities of different religions. The main language is, of course, Arabic, and the main faith is Islam.

The architectural heritage obviously bears the testimony of this variety: for centuries, the country was a crossroad of great civilizations, each of which left its architectural and cultural influence. This naturally reflected on the architecture, habits and lifestyles of local populations.

Urban Organization

Syria is administratively divided into 13 Governorates, and a special Governorate Status for the Capital City Damascus. Each governorate is organized around a major city known as the Governorate Center-City. The countryside of each governorate is then divided into regions. In the center of each region we find minor cities. A town must have a population of more than 20,000 to be considered a City and be allowed to administer its region. Smaller villages and farms are organized through smaller districts within each region.

By the year 2000, a total of some 84 urban centers had a City status. In the early 70’s, as the urban growth was registering its highest rates, Syria enforced a new Local Administration System. Cities elected City Councils to supervise their administration. Each Council has a small Executive Bureau to steer its work and this Bureau is headed by a Mayor. The Governorate level is administered by a similar system and has an elected Governorate Council. The Governor is appointed centrally and supervises the work of all government agencies in the governorate. Governorate Center-Cities have a greater level of autonomy and have a complete set of technical departments at their disposal. Smaller cities depend on the technical services provided on governorate level.

The Ministry of Local Administration is in charge of coordinating and administering operations of the Local Administration Law. However, technical decisions related to urban planning, infrastructure and housing are coordinated with the Ministry of Housing. These two Ministries combined control over 10% of the national budget.

City revenues are constituted with locally collected fees and investments as well as a quota of national taxes (calculated on a per capita basis). Often, Central Government subsidies and grants are provided to finance large development projects. Specialized Ministry departments provide budgets for operations within their branch and for local projects in the governorates. All governmental budgets in Syria are submitted to approval on a national level.

Between the City administration and the residents of the city, we find neighborhood committees and district clerks. The dialogue developed in these committees allows for an informal participation process. However, the true formal representation of residents is materialized in City Council elections, held every four years.
Urban Phenomenon

One of the major development trends is not limited to Syria but is a vast East Mediterranean trend: a mass rural-urban migration resulting in haphazard urban growth. Over the past century, the proportion of the world’s population living in large towns and cities has increased from 5 to 45%, and is expected to reach about two-thirds by the year 2030. In Syria, the year 2000 estimate states that 54.5% of the Syrian population currently lives in urban areas and that the urbanization of Syria is increasing steadily.

Driven by economic factors and a great difference in living standards between rural and urban areas, waves of inhabitants migrate from rural areas, forming large uncontrolled settlements around major cities and urban centers. This phenomenon has reached an extent where the two major cities in Syria, Damascus and Aleppo, are now the home of about one third of the Syrian population.

Uncontrolled settlements refer on the one hand to residential areas where groups of houses have been established illegally without any legal claim or right of land or, on the other hand, to unplanned settlements and areas where housing doesn’t comply with current planning and building regulations. Because of the haphazard and frequently illegal nature of these settlements, their populations are often deprived of basic facilities and comfort, as well as access to basic services or social benefits.

Aleppo

The city of Aleppo appeared in history for the first time in the Acadian period, in the third millennium B.C. The Amorites settled in the area in the middle of the third millennium B.C. and established their kingdom (Yamhad). The Haithheen conquered the area and held it till 1600 B.C., followed by the Egyptians, where it became a part of the Pharos’s Empire. The Assyrians ruled up to 612 B.C, and in 539 B.C the Persians took over Aleppo. It was in this era that the name “Aleppo” was first mentioned: “Aleppo the son of Mahr”. During these times, the areas located south of the Old City were established.

In 103 B.C. Aleppo was rebuilt in the Saluki’s age and expanded to absorb the newcomers from Macedonia. The new areas were influenced by a Hellenistic style: all the streets were straight and orthogonal, facing the four cardinal points (chess board pattern) and the city walls were built parallel to the neighborhoods. In the 4th century (the Roman age), Aleppo became one of the major cities in the province of Khalstic. It fell under Byzantine rule in 330 A.D. and further expanded to include new areas. The Muslims entered the city in 636 A.D. and the city walls and castle were fortified for defensive reasons. A few mosques were built in this period.

The city stretched out further in the Umayyad era: khans, tkiyas and new mosques were built. The city was then attacked by the Crusades in 1100 A.D.: for defensive reasons, every neighborhood had its own markets and services and a gate on the main street leading to the neighborhood. The city flourished in the Hamdani era (the most famous ruler of that era was Saif Al Dawlah). In this era, the urban areas expanded and palaces were built. The walls were extended in the Ayubbid period and some new neighborhoods were established beyond the ramparts. The city continued to expand in the Mameluke era and residential areas surrounded the castle after it was destroyed by the Mongolians in 1258 A.D.
In 1516 the Turkish leader Saliem the First entered the city, turning the city over to the Ottoman Empire. In this era, large construction projects transformed within the walls and beyond the walls, and the administrative system was changed. These innovations included a widening of the streets and the creation of the Al-Jadaideh district in the northern area beyond the city ramparts. This era also established new schools, new mosques, khans and markets. The city was boosted by energetic commercial development: caravans could find all the crops of the east in Aleppo, and the industrial sector flourished, becoming a center for raw materials and a market for European products.

In the 17th and 18th centuries, many unofficial measures were taken, including local building procedures, resulting in the establishment of new construction techniques and new typologies.

In the year 1832, the city fell in the hands of the Egyptians, but the Turks crossed the Euphrates again and regained the city. In the 19th century, the city developed a great deal, new streets were opened, the moat was filled and became a street, two and three storey buildings started appearing and dominated the architecture of that period, introducing a new architectural style, the traditional Arabic courtyard house. Squares and public gardens were made, rail roads and two train stations were established, new districts were planned and new directions were set for expansion, connecting with the Old City.

The quick development of the city continued up to French occupation in 1920, the city urban planning was then set by French planners Dange and Ecochar. In this period, wealthy people and foreigners lived in new areas where buildings were surrounded with gardens: move away from the traditional house and the situation of the higher classes in the areas had negative impact on the old city, and the differences between residents of the two areas became too blatantly obvious.

After the independence of Syria, the French planner Gotten proposed a plan in 1954, suggesting a reorganization of the city by opening more streets. Some of these suggestions were implemented whilst others were canceled in the following master plan program drawn out by the Japanese planner Bashouba in 1974. As a result of these plans, some areas of the old city were destroyed to make way for the Bab al Faraj project (10 hectares).

In 1986 the recommendations of UNESCO were taken into consideration and the Old City of Aleppo was listed as World Heritage.

**Damascus**

There is no text to tell the exact time of the first settlements in Damascus. However, there are clear indications to the emergence of the city, from the beginning of the eleventh century B.C. At that time, Damascus was an important city as it was the capital of the Aramaic kingdom. The castle, the kings’ palace and the old temple were located on a plateau; it is hard to estimate the diameter of the original plateau that was in the very centre of the city, looking over the surrounding areas. The temple and the palace were the heart around which lived the urban community. There are manuscripts describing how water was channeled to the city in ancient times, using nearby canals.

The city, according to documents and excavations, was not very different from the villages surrounding Damascus nowadays. It had no formal shape: the way in which the city was built was adapted to the nature of the landscape and the parameters of properties. Mud and wooden frameworks were used, exploiting a number of materials available locally.

In the year 333 B.C the city was linked to the Greek expansion and joined Alexander’s empire peacefully. After the death of Alexander, the city was given up to the Salukis: during this period it was rather similar to European cities though its location made it an oriental–Greek city. During this period, the city was renowned for its well proportioned building style and its organization. Houses were built in rectangular neighborhoods, identical in size, divided by straight streets.

In later stages, the ties to Rome further enriched the city and Damascus flourished as it had never before thanks to the stability and peace that it enjoyed at that time. With time, the Roman colony of Damascus grew independent but maintained the organized form it inherited from the Greek age, introducing a main street with large, important buildings on each side of the street.

That Arabs entered Damascus in the year 635 A.D.: in the beginning, the only signs of the new rule were the mosque and the khilafah house, that were built side by side in an empty sector of the city where the old temple used to stand. Later, the mosque was enlarged and became a token to the Greatness of the Umayyad period (and was named the Umayyad mosque).
After the downfall of the Umayyads, historical incidents increased as the Abbasids exhausted the city and its people with wars. These uncertain times continued until the Fatimid age. The appearance of the Seljuks put an end to troubled days of the city. The only development factor these periods brought to the city was triggered by the high level of insecurity: inhabitants had to look after themselves, gathering and organizing in groups. This transformed the city into a group of autonomous areas: each area had its own mosque and lived according to its own sort of lifestyle. Differences extended to the ways water systems, public baths and markets were organized (according to religions, tribes, and social groups...).

It wasn’t long before each area had its own door, locked every evening, with smaller to smaller streets, leading to private houses.

But there was a common denominator that brought these areas together into forming the larger city beyond its walls: the big mosque and the main market areas.

In 1174 A.D. the Ayyubids controlled the city, their age was considered a real revival period for the city. The Ayyubids gave the city a strategic position from a military, cultural and religious point of view. They built the castle, the sultan’s residence, on the northern western corner of the Roman wall, and surrounded it with government buildings. They also restored the city wall. The market areas grew, testifying to the economic growth of the city. Another important feature of this age was the tendency of religious sects to gather into specific quarters of the city: many bimarstans and schools emerged in this era.

After the Mongolian conquest in 1260, Syria became part of Egypt under the rule of the Mamelukes. The military importance of the city played a big role in helping the trade sector flourish, encouraging the growth of markets that became increasingly specialized. Along with this industrial and commercial development, the need for labor increased and lead to an increase in population, calling for two new residential areas. The Mamelukes built a number of monuments that decorated the city. In the later stages of Mameluke ruling, the city deteriorated and suffered from poverty for many reasons. The city was in ruins when Sultan Saliem the Ottoman took over in 1516, but the vastness of the empire helped Damascus become once again a major trade area, especially because of its strategic location on the Hajj road. Khans and warehouses appeared and the Ottomans built large mosques that resembled the mosques in Istanbul (Constantine). At the end of this age, the city was influenced by European culture as a result of Muhammad Ali’s conquering of Syria from 1832 to 1840. He built special health services, administrations, traffic organization facilities, and new markets.

The French occupied Syria in 1921. In this era, the influence of European architecture was prominent and the expansion of the city was influenced by western urban planning and European building typologies. A new city was built beside the old city and beyond its traditional boundaries.
There is a rich diversity in building types in Syria; they can vary according to the region and people’s lifestyles. However, two main lifestyles generate a major difference of construction and dwelling: nomadic and sedentary.

The first lifestyle is called nomadic and depends on pastures as a daily economic activity; it requires constant migration from one place to another in search of pastures and water. These populations are called “Bedouins” and usually live under a tent. They can change geographic locations with their families and groups (usually tribes) according to the available pastures or water necessary to work and live.

The second lifestyle is the sedentary lifestyle, usually linked to cities and the countryside. The types of houses in a city or the countryside also differ according to the geographic location (seaside, mountain, valley, etc.). But there are still some clear differences between the traditional city house and the traditional country house: for example, the traditional city house is characterized by stone constructions with different types and colors and a great variety of building typologies. It essentially consists in a main inner courtyard surrounded by rooms for daily or sometimes evening activities. The country house’s courtyard tends to be used more as the garden of the house, surrounded on one side or more by rooms, while the rest is bordered by a wall. The internal partition splits the house into two areas: one for the inhabitants and another for the animals. Seasonal vegetables are usually grown in this garden.

Countryside houses are generally small, ranging from a two unit house with Mastaba in the front, commonly found in the coastal region of “Mashkita”, near Lattakia, to the house with courtyard where rooms border the courtyard, giving the house more space. In this case, more than one family can live in the house, such as it is in “Sfireh”, a village located on the outskirts of Aleppo.

Generally, the number of inner courtyards in the traditional Arabic house differs; the more luxurious the house, the greater the number of families living in it: some very big houses have 2 or 3 courtyards. As for houses with a single courtyard, they differ according to their occupant’s economical status; some houses have large courtyards with a fountain in the center, surrounded by trees, while others, smaller in size have a plain simple courtyard.

Morphological classification

Seven main types have been distinguished; particular dwellings linked to the two main lifestyles mentioned above, in urban and rural areas:

- The Tent

Tents are nomad shelters used by Bedouins as dwelling; they are easy to put up and take down for transfer. A nomad’s life is linked to sheep farming, which means...
constantly moving from place to place, looking for pastures and a suitable environment for the community and its livestock. They generally move about in the desert, in plains, in the eastern areas of Syria, near the banks of the Euphrates and close to the Turkish border.

Tents are used for multiple purposes; they can be of different sizes, according to assigned function or use:

Firstly, there is the large tent made to suit the nomadic lifestyle, split into two parts: one for women and another for men. There is also a section for guests separated from the other sections with a felt or cloth curtain, sometimes with supply bags and fine reeds. Saddles are usually hung on the left side of the tent and some belongings are also stored there.

Secondly there are small tents, usually used for household activities, including the kitchen and cooking area, or to stock fodder and store equipment.

The actual tent is rectangular or square and is made of woven wool, taut by ropes from the outside and fixed into the ground with stakes. The woolen fabric used is characterized by its relative good insulation properties and its ability to protect from the summer heat and the winter cold. The families that live in these tents usually consist of three generations. In some areas, we can find groups of tents in which a number of families live together, sharing water and pasture.

The tents are equipped with all the necessities for a nomad’s life, which has almost remained unchanged: they still sit and eat on the ground, and their tents are furnished in the same traditional way, with mattresses, pillows and reed mats.

- The Basic House

This type is composed of two aligned living units; they are open on the exterior, either in front of the house called “Mastaba”, generally used as a leisure part of the house, or on the back of the house, called “Zribeh”, and used as a stable for animals. These two rooms communicate through a door; their use is mixed between day and night activities. The first is mainly used as a bedroom and the second as a kitchen and food storage area.

This kind of spontaneous construction belongs to the rural world; the house is mainly composed of one floor and is associated to a farm called “Bustan”. It is found scattered in the mountains near the city of Lattakia.

- The House with a Riwaq

This type of house is composed of several aligned rooms forming a residential unit; they are connected to each other via a covered gallery called “Riwaq”, which makes up the whole front elevation.

This type of houses is common in the villages of the southern region of Syria, to the north of Damascus; it is used mainly as residence.

- The House with a Liwan

This type of houses can be found in the region located north of Damascus. It is a tripartite structure composed of three aligned units: two are used for living and the central unit, open on the exterior, is called liwan. The connection between the two living sections takes place through the liwan, which is used as a distribution space. This house is a typical multipurpose rural house, used for living, as a “local workshop”, as a warehouse, and finally as shelter for domestic animals in the central space (liwan).

- The Rural House with Courtyard

The difference between city and country life has an impact on building the typologies and shapes of houses: building materials therefore also differ in the outskirts of Syrian cities.

Life in the countryside depends on agriculture and livestock farming, this lifestyle calls for a courtyard attached to the house. It is used as a private space and is not necessarily surrounded by rooms. It can also have specific areas for animals e.g. horses, poultry, and seasonal vegetables.

Examples have been found in the surroundings of Aleppo, in the city of Sfireh, where mud structures and the use of mud cupolas in roofing are dominant. This typology is based on the use of one main unit, 4x4m, covered with a cupola and repeated around the inner courtyard. The larger the house, the richer the owner; the more units there are, the larger the courtyard.

Although these houses never rise higher than the ground floor, it was found that they are generally divided into a number of sections: the day sections, with rooms for men and rooms for women, the kitchen and service rooms, including the “tanour” (traditional oven), the bedroom section and a special area for animals, with a stable and animal stalls.

Mud cupolas are also used in Tiara, on the outskirts of Aleppo, but in this case the whole building takes on the shape of a cupola, not just the roof as is the case in Sireh.

With time, buildings changed and roofs became flat, covered with wood, plants and earth. After the emergence of reinforced concrete, cement, and CMU (concrete masonry units), they became flat concrete roofs; walls were either kept as a traditional structure or made with stone or CMU, because of their greater durability and due to the fact they don’t need any periodical repair. Another reason for the decrease in the use of mud is the lack of craftsmen capable of making and repairing mud structures. The new solution hasn’t fulfilled the needs of the people on the level of thermal insulation: traditional buildings surpass modern structures in this field; they provide better acoustic and thermal insulation and are more environmentally adapted. Traditional walls are thick and can reach 70cm wide; mud itself is an insulator that keeps the temperature in the house stable in hot and cold seasons.

The most specific characteristic of this building typology is the limited number of openings, as can be observed in most cases, limited to the front door and small vertical long windows. It was noticed that locals make a hole in the cupola of the storage room to fill it with grain, then seal this hole. Earth rendering is used to cover the outer walls; the inner walls are usually covered with limewash.

Mud has been used as a main building material in many other rural areas and with different building typologies and shapes. Mud houses and rough stone houses can be found in the areas surrounding Damascus and Ghouta: buildings are made with wooden frameworks and are often two storeys high. In other cases, city building typologies are preferred, including the private courtyard that is most often completely surrounded by rooms. Sometimes city architectural elements are also applied to rural housing,
such as the Liwan (large alcove opening onto the courtyard) but in a much simpler version, using cheaper materials such as wooden roofs covered with plants or mud and brick walls...

- **The Urban House with Courtyard**

  One of the most common building typologies in Syria is the traditional courtyard house. It can be found in all Syrian cities, just as it can be found in all Mediterranean countries.

  This building typology is characterized by a small number of relatively small openings in the external façade, and a large number of openings that open onto the inner courtyard. Traditional houses vary in size and luxury level, and inner spaces vary in number and size from house to house, although they all have one common feature: the open courtyard gives the occupant a feeling of privacy and privileges the relations between the individuals of the family, who develop a strong attachment for the house. The inner courtyard is a garden and the center of household activities: all the rooms are set around it and open onto this gathering place. In large and medium sized houses, a fountain is placed in the center of the courtyard and freshens the air; trees are also grown in many traditional courtyards, adding shade and life to this exclusive area.

  The height of the traditional house is limited, usually no more that 10m for two storeys. Generally, the living rooms and service rooms are on the ground floor whilst bedrooms are on the upper floor. In large houses with over one courtyard, spaces are separated into an area for the owners of the house, another one for guests and a third for servants. But not all large houses are luxurious or rich in architectural elements, though they can have more than one courtyard.

  In the traditional building the courtyard is accessed by a corridor starting at the house’s front door, a design which ensures privacy and security. Moreover, most of the doors and windows open onto the inner courtyard. The openings on the external façade are limited to a few long windows and high windows.

  Traditional Arabic houses are known to be welcoming environments, and are friendly in both their design and structure. For example, courtyards are equipped with many elements that help humidify the air (trees and fountains); they also use the iwán as an open summer sitting room facing north. The thick walls and roofs are good insulators and help stabilize room temperature, while the variable roof heights and protruding elements in the façade provide shade.

  Some elements appeared in the traditional urban house to help increase the amount of shaded areas, such as:

  1. The use of protrusions and cornices on the outer façades or on the inner court, facades that look over the courtyard.
  2. The use of the “Kishkis” (protruding wooden kiosk) to cover the openings in the external wall, rarely used on inner facades.
  3. Some traditional houses use the roof garden as a way to lessen heat in the house.
  4. Covered streets protect external walls from direct sunlight.

  Traditional houses in urban areas also contain many architectural elements made to ensure a natural airflow through all the spaces; wind catchers as well as openings opposite each other are used. A great variety of ceiling heights are used and the main spaces of the house are conceived so as to be ventilated by soothing winds.

- **The Lebanese House**

  Throughout the eastern Mediterranean, we find a characteristic and common typology which bears the name of the country where its presence is the strongest: Lebanon. The Lebanese house appeared in the second half of the XIXth century and is linked to both Ottoman modernity and the development of a middle-class in the area. This typology represents a great change in the organization of space in the traditional house: it is the result of the incorporation of new industrial materials as well as of the new urban regulations and development programmes in that period.

  The central hall is the main characteristic element of the Lebanese house. Around this hall, or large central room, we find several rooms for dwelling. The façade rooms open onto the outside through an ornate triple arch window. There is also often a balcony which prolongs the room towards the garden or the street.

  The Lebanese house generally found in Syria is very modest compared to the houses in Beirut, but it really is the most modern middle-class traditional house in Syria. These houses are found throughout the Mediterranean area of Syria.

### Evolution and Transformation

In this chapter, we will discuss the changes that have overrun traditional building styles and techniques over the years, as well as the developments that could have affected the building shape and function. Obviously, this process has been rather slow and has given each era a chance to express itself and establish its own building techniques, materialized in buildings that still stand today.

Traditional architecture usually depended on handicrafts, and building materials made from natural components were widely available locally.

These materials differed from area to area, thus conferring particular characteristics to the architecture of every area in Syria: this is noticeable in the style, color and dimensions of buildings, all adapted to local lifestyles and needs. Some of these characteristics have withstood time, others have changed or have been altered to adapt to modern times.

Building types have undergone changes in both the city and the countryside but to varying degrees. In some cities, the difference was blatant: building types, both in use and shape, moved away from the traditional forms. On the other hand, the development in country architecture varied: it was sometimes limited to small changes, confined to building materials or techniques, and other times calling for significant changes, affecting the whole building type.

The reasons for transformation are many; one is insufficiency of the number of buildings to face an increase in population. Sometimes, as with the traditional houses of the Old City of Aleppo, cities expanded horizontally to the point that the downtown population, in need of central housing, transformed 2 storey traditional houses into multi-storey buildings.
One of the main reasons that caused the near disappearance of several construction traditional crafts and the disappearing of some other crafts, is the declining number of skilled craftsmen: they alone knew the building arts and processes; how to prepare materials, determine spans, and dedicate the necessary time for every phase. The other reason is the shortage of traditional building materials together with the emergence of substitute materials that are faster to implement and are more durable.

The fact that some areas that use the traditional types of building have become tourist areas has changed the use of these buildings and the character of the area, introducing alterations in the materials used, and limiting building permits.

- **Formal Transformations**

- **Those that modify volume**

  These changes can be implemented by increasing the volume of the building, its height or width, or by adding alterations that affect the original shape of the building or its overall appearance.

  The reason for this expansion can be the emergence of new needs or a new use of a building itself; or this expansion can be caused by a growth in population, in turn increasing the need for real estate, which naturally expands the city towards new areas.

  Many problems arise from expansion, such as new needs, standards and additional services. Expansion results in the introduction of more cars into the area: this traffic increase, a result of the natural growth of the population, adds new technical infrastructural problems to the old fabric. This is the situation in the old cities of Damascus and Aleppo. In these two cases, the pressure on the old centre of the city is such, it has affected the urban tissue, the technical and social infrastructures. It has also brought about changes in living standards and expectations, leading some inhabitants to abandoning the old city, others to changing their houses, by adding on new floors or rooms. Changes also bring about alterations to openings, new house layouts and distribution, and the addition of modern, non compatible, materials and other changes.

In some villages that used mud cupolas to roof their buildings, the need for a second floor, in order to cope with the increase in population, has caused the removal of these mud cupolas and their replacement with a concrete flat roof. Although these roofs are quick to implement and are durable, they are considered poor thermal and noise insulators.

Some of the changes that have occurred over the years are the result of the residents’ and craftsmen’s experience, and some of these changes are considered as “new styles” or a different way of building. These innovations played a role in changing typologies, but didn’t affect use and utility. Every building style has its own way in dealing with building requirements, the roofing method changed in the early seventeenth century to wooden roof; in some cases this was a substitute for vaults and cupolas.

- **Those that modify openings**

  The term “openings” not only refers to the openings on external façades, such as doors, windows and arches: it also includes open and half open spaces inside the building e.g. the open courtyards and balconies in some building types.

  The general reasons for alterations carried out on openings differ from one case to another: they are sometimes carried out to let in more sun and light, they are sometimes due to a change in living standards inside the house, such as a new layout of rooms or a grouping of multiple rooms into one, therefore calling upon new openings that alter the shape of the original openings, arched or ornamented.

  Another situation that can be harmful to the building is the case where the inner courtyard in the traditional house is closed, blending partly or fully into inner rooms. This affects the amount of light and sunshine that enters the house, as well as the general shape of the building, changing the typology of the building itself.

- **Functional Transformations**

- **On the level of wall partitioning**

  These types of changes are mostly related to daily life constraints or the inability of these houses to develop and host a greater number of occupants. Therefore, occupants decide to divide up rooms with wall partitions or to arrange the inner spaces differently to increase inner volume.

- **On a three dimensional level**

  These types of changes can affect the typology in general; in some cases, they can cause a lot of alterations to the plan of the building in terms of space distribution. In certain cases, this can go to the point of constructing a wall inside the Liwan (the main hall), dividing a vault or splitting a room covered with a cupola.

  In the case of a façade: a part or a whole window can be sealed up with blocks, or new openings with different shapes and styles can be implemented. Some cases were reported concerning ruined wooden “kishk”, replaced with blocks and reinforced concrete: this massive wall was either blind or had a few openings, but nothing comparable to a wooden “kishk”, neither in appearance nor in terms of performance.
Typologies of Traditional Buildings in Syria

The House with a Riwaq

The tent

The Basic House

The House with a Liwan
The Rural House with a Courtyard

The Urban House with a Courtyard

The Lebanese House
The Building Arts

Introduction

The study of building typologies in Syria involves discussing details concerning construction techniques, materials used in construction and their availability in the local environment, as well as the methods used to prepare these materials in traditional architecture.

In general, the traditional building typologies required great precision in the use of traditional tools by craftsmen and technicians to achieve exceptional results. Slightly improved forms of these tools are still used nowadays: they have changed to adapt to new techniques in architecture, and in some cases give faster results though they are usually less accurate.

Completion time and factors that help the building process and the remaining techniques and methods used to complete the building process must also be studied.

Lifestyles change from one place to another, and the building materials that change according to availability in the particular area, produced different building typologies in different areas and cities. The building materials available in each area define the building typology as well as the shape of the buildings and their overall appearance. This can be clearly observed in rural architecture, as some villages use mud as a main building material, while others use rough stone constructions or wooden frameworks filled with earth. Furthermore, the building techniques used in mud architecture also vary in roofing methods: in the north, mud cupolas are used while flat roofs are dominant in the south. In cities, stone is the main material used in building; though a few other rare typologies can be found.

In this chapter, we will discuss the architectural features of traditional buildings in detail; this will be done according to a classification technique of building elements, followed by the different variations of these elements, and the consequences on a structure when changing building materials. This classification includes vertical elements (walls) and horizontal elements (roofs), renderings, openings, arches, etc.

Walls

- Stone Walls

Stone was the main building material used in most Syrian cities. It was also used to build houses in some villages were it is a widely available raw material, such as in Ezra’a.

Some masons specialized in building stone walls. In general, a number of masons were needed to build a stone wall, some of whom specialized in preparing the stone while the others built the wall. There were many types of stones, and they differed from area to area and city to city: limestone was used in Aleppo while limestone and basalt were used in Damascus. We will explain later why the stone used for the internal façade was different from the stone used for the external façade, and why some villages in the southern areas used different size rough stones for building.

- Ashlar and dressed quarry stone walls

Stone walls have been used in all types of buildings since the beginning of urban construction. They can still be found in the old cities of Syria (The Old City of Aleppo, The Old City of Damascus, The Old City of Homs...).

A variety of stones, such as ashlar and dressed quarry stone were used in building and constructing walls. The type of stone used differed according to the wall type and its function in the building, it could either be an internal wall or an external wall. In general, the stones come in large random shapes, which are then squared in the workshop and made into a standard rectangular shape.

The stones are laid in a mortar of mud and straw. The wall is built on a stone foundation, usually a trench in the ground around 1m deep. Then the wall is constructed with two stone facings, with a rubble and soil filling between them. The thickness of each stone facing is about 30 cm, and the width of the core is about 10cm: the complete wall is about 70 - 80 cm thick.

One exceptional type of hewn or dressed stone wall presents an alternation of colors in the stone courses. These walls were used in the old houses of Damascus because of their durability and beauty, and were especially used in the walls opening onto courtyards, giving these walls an aesthetic role. They can still be observed today in the main rooms and in the inner courtyards of old prestigious Damascus houses. These walls use three types of stone: Black basalt, which is strong and durable; White, yellowish, or reddish limestone that is less durable; Mazzi Stone (found in the area of Mezzeh), which is pinkish and quite hard.

The thickness of these walls ranges between 50- 90 cm and they can reach 30 m high in some houses. They are constructed on a rough stone foundation. After they are cut and grouped by size, the stone courses are laid in alternating colors (black, yellow, and white) in a pattern (coursed ashlar running bond). Lime mortar (exceptionally lead) is used to bind the stones, and these walls are not rendered.
- Rough stone walls
These walls are often used in village houses, for example around Lattakia, where stone is used in building many different shapes and sizes of walls.

The foundation that supports these walls is dug to a depth of 50 cm, and its width reaches 100 cm. The foundation consists of large uncut rocks with rubble packed in between them. The wall (a double facing grouted cavity wall) is then built on this base. It consists of two stone faces about 25 cm wide each. The core is usually filled with rubble and earth, mixed with straw. The complete wall is about 60-70 cm thick and plays an important insulation role. Mud mortar is used to join the stones together and is also used in pointing the external walls, to fill in the gaps.

- Dry Stone
These walls are found in the south of Syria, where volcanic basalt rock is widely available. The ruins of basalt houses still stand today in the provinces of Daraa and Sueda, withstanding harsh climates and time.

Ashlar is used for building walls. These stones change in color according to their mineral composition and are designed to withstand vertical and horizontal loads. The dimensions of the stones are about 37x 37x 70cm, and the thickness of the wall reaches about 70cm; they are laid in a running pattern. A trench is dug in the ground and is filled with hard rubble; then scaffolds are made to raise the heavy stones which are then laid in a running pattern.

- Mud Walls
- Mudbrick walls
Mud walls were used in building in both the city and the country and they can still be found in some buildings in the Old City of Damascus and a few villages in the outskirts of Aleppo and Damascus.

Mud is the main building material in this type of construction: it is used in the body of the wall, in rendering and mortar. First the mud is prepared and mixed with straw, which gives it strength, and then it is put into formworks to form mud units that often reach the following dimensions: 10x40x20 cm. Mud mortar is used in bonding the mud units: both have the same contents but the mud used in the mortar is sieved and refined making it smoother and easier to apply.

Mud walls are built on the very ground if it is rock. If the ground is loose, the wall is built on a stone foundation of about 50-75 cm deep and which rises about 50 cm or more above ground level.

The wall is built on these foundations at a thickness ranging between 60-70 cm and the mud bricks or elements are assembled alternately: every two long units for one wide unit and so on. Finally, the walls are covered with a mud or lime rendering on the outside to make them smooth.

- Rammed earth walls
These walls consist in courses of mud blocks: they are found in the Damascus region, and are known for their low cost and fast construction. Pebbled soil is put in formworks that slide along the walls: the formworks are 150 cm long and range from 80-90 cm high, the width ranges from 50-60 cm.

The foundation for this type of wall is made from limestone and mortar 120 cm deep and 60-80 cm wide. The surface of the foundation is leveled, then the formwork is put in the corner of the building and filled with wet pebbled soil that is pressed and rammed with a stick, then the formwork is slid further to make another unit.

In this building type, small stones are used to join the courses together. Finally, the walls are covered with a mud or lime rendering to make them smooth.

- Woodframe Walls
These walls were used in cities and are still found nowadays in some villages. They are based on a wooden frame that bears and transfers the loads. In general, these walls are constructed on a continuous masonry base. In Syria, this technique is used for upper floors whilst the ground floor is constructed with stone walls.

In general, the formwork consists of vertical columns that are systematically spaced about 25 cm apart, joined by
horizontal beams, and diagonal bonding beams that are crossed in an X shape to protect from collapse.

The spaces in the wooden frame are filled with mud units (dimensions of unit 17x17x10 cm) which are dried and hardened in the sun. These units are regularly laid at a 45 degree angle and are covered with a mud or lime rendering.

**Openings, Arches and Associated Elements**

In general, openings are divided into two groups: the first consists of doors and windows, the second consists of arches.

The shapes of these openings change according to style and age. Many different civilizations flourished in Syria leaving testimonies of their architecture on buildings and architectural elements, including the shape of openings and arches. In some exceptional circumstances, multiple architectural styles can be found in a same single building.

- **Openings**

  The sizes of openings vary in stone buildings: the borders of these openings are either straight, curved or pointed. It is important to arrange the top part of the opening carefully so that it can withstand loads and transfer them to the jambs. The top part is called the *"najafeh"* (lintel) and the sides of the opening are called the *"fakhdan"* (jambs). Many different types of lintels can be found in old buildings, such as the one piece straight lintel, made of stone for the outside and wood for the inside. Flat lintels are also used when an odd number of stones are arranged carefully and locked into place, with a central stone called the key stone; the resistance of this type of opening depends on the shapes of the stones, their contact and fitting. The stones that rest on the jambs bear the greatest loads from the upper layers. A slightly curved lintel a semi circle arch, a pointed arch or a horse shoe are sometimes used as well, all structurally performing.

  In general, the stone lintel is used on the external façade for all types of arches. On the inside, a wooden lintel is generally put 5cm higher: it consists of wooden logs arranged over the width of the opening, covered underneath with a thin wooden panel called *"al twan"* (sofit).

  The openings in mud architecture are limited to doors and small windows, the largest of which is 1.2 x 0.9 m. Very small openings range from 20 to 40 cm wide and are 40cm high; these are only used for ventilation.

- **Arches**

  There are many ways to construct arches: these change according to the different building typologies used in the Syrian areas, but in general they are mainly used to shorten the span.

  Arches are frequently used in urban architecture and are widely used in the architecture of important buildings and religious structures. They are found in the entrances and passages of these buildings, and are used in houses on a smaller scale, mostly in the iwan. The shape of the arch changed with the change of architectural style and age.

  Arches were used in rural stone architecture, especially in the architecture of southern area and the Damascus area, to shorten spans. These regions used rough stone to form the inner arches and ashlar for the arches on the external facades. Most of these arches were semicircle shapes transferring the loads to the base of the arch.

  The arches that were used in Syrian architecture depend on the architectural style. Semicircle arches or transcending arches are used in the Umayyad era, with plant ornamentation and elements such as grape vines, palm branches, roses and tulips on their edges.
Pointed arches consisting of two sections, an upper flat section and a lower curving section, are originally Persian and were used in the Abbasid age. These were then further developed in the Ottoman age and were modernized, making the flat part of the arch more complex.

In the Mameluke era, pointed arches made of two joining arches were used, which had wide openings known as the "maghmous" type (a double centered 5-segmental span). A new type of arch was also popular in that period; it consisted of components making the arch look like a group of books tightly placed together; this style can be considered an advanced version of the ribbed arch.

- **Kishks**

Kishks (wooden kiosks) are protruding windows that look like closed wooden balconies. They were used in traditional architecture to ensure the privacy of a house but let inhabitants see passersby and watch the street without being seen; they also provide natural ventilation. Kishks are considered an Ottoman architectural feature that spread in Syria in the Ottoman period.

The wooden construction of the kishk rests on stone consoles; in modern constructions steel beams replace the stone consoles. Kishks were decorated simply; special attention was given to corners, cornices and the "oriel" (underneath the projecting sides of the roof).

The walls of the kishk are composed of round wooden studs covered on both sides with wooden panels; the exterior panels are usually decorated with fine woodwork. The windows are usually integrated into the external wood construction; window types followed the historic period of construction.

The ceiling is composed of wooden planks supported by wooden beams and covered with decorated wooden panels. Kishks also have a sloping wooden roof that is protected with metal sheets.

We can differentiate several types of small kishks, such as secondary kishks mashrabias.

The condition of the kishks nowadays is usually very bad due to exposure to weather and lack of maintenance. These factors have caused damage to the outer facades of kishks and in some cases have even damaged the kishk itself. A rapid treatment of the problems or pathologies lessens the amount of effort and the costs in the long run.

**Vaults and Cupolas**

- **Vaults**

Roofing using vaults is an old way of covering large halls, crossing areas and passages; no matter how long they are, as can be observed in traditional souks.

There are two types of vaults in traditional architecture: 1- Barrel Vaults: also known as half cylindrical vaults. 2- Cross Vaults: consist of two consecutive crossing and orthographic vaults.

Stone is the main material used in building vaults; both types of vaults have the same building principle. They are structured on a wooden formwork that takes the shape of the vault; this frame is built up to the height of the wall and is supported by horizontal and vertical supports that hold
the arch-shaped frame. Mud or lime mortar is used to join the stones and give the whole structure stability.

The thickness of the roof ranges between 35-40 cm, plus the layer of earth filling used to fill the gaps that finalize the shape of the roof: this surface structure increases the thickness of the roof, thereby further improving its insulation properties.

- Mud Cupolas

Mud cupolas are used in covering spaces of mud construction. They are found in the countryside of the northern areas of Syria. Mud is the main building material used in this type of architecture and it is also used in rendering and binding.

Coarse earth is mixed with water and straw to make the main building unit that is shaped by putting the mixture in frameworks, 10x 40x 20 cm. These units are used after they have dried and hardened in the sun.

The thickness of a mud cupola ranges between 30-40 cm and its summit can reach 7 m high. The builder starts building the first course from the four corners of the space, the courses are arranged on top of each other towards the center, while mud mortar is used to bind the structure. The earth rendering is made from fine earth mixed with water and straw and is used to make the cupola smooth and help finish the shape.

- Stone Cupolas

Architects used cupolas as a substitute for the flat roof. Stone cupolas were considered one of the most important architectural features used in roofing: it covers the main spaces in mosques, churches, baths and some great houses. They were used in all Syrian cities and in some villages that used stone for building.

These cupolas take on different shapes: semi spherical, onion shaped or ribbed; they can also be an egg shape, depending on the dimensions of the space and the ratio of its length to its width.

Stone is the main building material: each stone is cut and smoothened to reach the standard dimensions of 30x30x25 cm. The formwork that is used to set the shape and degree of the stone’s curve must be prepared to give the structure a smooth surface from the interior and exterior. The stones are lined up on the formwork, in their final position, up to the final stone, which is called the key stone. The latter can be cut into a star shape, a round shape or a squared shape.

Lime mortar is the binding material used during construction; lime rendering is applied in the final stage on the inside facings.

Flat Roofing

- Stone Roofing

This construction type appeared a long time ago in the southern areas of Syria, thanks to the availability of basalt, which is used in roofing. This construction type is unique in the area and this technique has reached a sophisticated level, clearly observable in the major monuments in Bosra, Shabaa and other areas. The basalt rocks are cut to the right dimensions nearby hills and valleys where they are quarried, and it is no surprise the area is famous for its carving stone craft. In general, the construction system is based on rectangle basalt rocks called the mizan (the scale): their dimensions are 35x37x70 cm. They are used as side beams that rest on the walls, increasing the span on which the rabad (long stones that are set over the width of the space) rests.

The construction system of these roofings is set in such a way that vertical forces and the horizontal forces (earthquakes) are systematically dispatched, but to a certain limit. The experience inherited through history has played an important role in the continuity of this type of building. Locals have learnt to use the basalt rocks and have reached the ideal dimensions that can be endured by the hard basalt rocks, and the optimal span that can be tolerated by the stone without breaking. This explains why the dimensions of the built units over the centuries are almost identical.

- Wooden Floors

Wood has been used in roofing ground and upper floors in houses and important spaces; this type of roofing is widespread throughout Syrian cities and villages and is
considered an important architectural, constructional and aesthetic feature.

Poplar logs have been used in roofing since it was grown in the nearby fields and was available in large quantities in nature. Cypress wood, known for its durability, solidity and quality, was also used. The diameter of the logs used is about 15 cm; they extend to cover the width of the room and are supported on either end by the walls of the room.

In some cases, in important halls and prestigious houses, the wooden logs are covered with wooden boards called “al Tabak” of 20x120 cm and 2 cm thick, which are ornamented with colored or gold decorations.

- Thatched roofing covered with mud
  This type of roofing is found in the Damascus region, in different shapes and styles according to the availability of raw materials, it can also be found in some parts of the Lattakia region and surrounding areas.
  In general, it consists of main and secondary beams and covering layers of natural materials e.g. tree branches, reeds, cane, straw, wooden slats, etc. Poplar, lazab, and oak woods are the main building material.
  The construction of the roof depends on a main beam, made of poplar wood with a 25-30 cm diameter. Extending above it, parallel to each other about 25-30 cm apart, secondary poplar branches (beams) with a 12-15 cm diameter are set. The covering layers of straw, reeds, leaves are then applied above. The span can reach 6 m and a layer of rough wet earth is applied over the top with a thickness ranging from 15-30 cm.

Wall Coating

In general, rendering in Syria is carried out using one color that differs according to what suits the building, and the materials used in making the rendering. Ornamented and colored rendering is only found in a few villages, in exceptional circumstances, giving the building a different character.

- Lime Plaster
  Lime rendering is still used as a rendering material for stone walls in cities and some towns in all over Syria, as it is a beautifying element as well as it is playing a role in protecting the walls from the external effects that may in the long run affect the wall’s durability and structural condition. Lime rendering is applied in three layers:
  First: the bsmar layer consists of dust with hydrated lime, sand with water.
  Second: the bitaneh layer is made of lime, hard sand, dust and hemp with water.
  Third: the dahra layer is made from lime, fine sand, dust and water.
  Lime rendering must be prepared according to special standards to ensure its cohesiveness and effectiveness: the time between the application of each layer must be taken into account. The quality of the original surface that the rendering is being applied on is an important factor in reaching a good final result. Therefore, the dampening of the wall before coating is important to ensure that the water of the rendering isn’t absorbed by the wall, in order to avoid cracks. In general, rendering is sensitive to external effects, which is why it must be renewed and fixed periodically.

- Earth Rendering
  Earth render is often used as rendering material for the external facades of buildings in which mud is the main material. Earth rendering is found in the region of Damascus and the outskirts of Aleppo.
  There are two types of traditional earth rendering: coarse rendering and soft render. Both types consist of mud mixed with water, with the exception of straw addition (wheat straw, or barley), in the case of coarse rendering, to give it more cohesiveness. Coarse rendering is then covered with a layer of smooth rendering.
  Mud rendering is characterized by its inability to withstand climate conditions and great need of regular renewal and fixing.

- Washes
  Whitewash is used on stone and mud walls; it is usually liquid. It is made from limestone that is soaked in water for a couple of days until it is ready for use. It is applied in one layer and produces a bright white color and a pleasant smell. In village houses, it is used instead of paint on the inside walls.
In general, whitewash is used to conserve the main material of the wall and helps ensure the durability of the building, protecting it from moisture.

**Evolution and Transformation**

Some formal transformations that modify textures can affect the aspect of a construction. The general shape of a building changes according to the typology, the area, the materials used, and the coating technique. In some typologies, earth and lime rendering have been substituted with cement plaster, which gives the building a different appearance, and also keeps the stone from breathing properly. If the rendering is not periodically renewed, it will fall off and ruin the appearance of the building; the reasons for this neglect can be poverty or inexperience.

**Materials and Know How**

One of the most important reasons for changing the typology and/or the construction technique of a traditional building is the change in the materials used, the lack of expertise and the shortage in skilled craftsmen who master the different typologies, and are able to produce the same quality as in old buildings.

For example, a mud cupola can be replaced with a flat wooden roof, covered with tree branches and canes, in turn covered with reinforced concrete, which is appreciated for its fast hardening, high resistance and durability. Another reason for the use of concrete is a lack of expertise to build, repair or maintain mud cupolas.

This also applies to other architectural features found in the old city, such as stone cupolas and dome vaults, which are also replaced with cement structures for the same reasons.

**Conclusion**

Looking at the current state of traditional architecture in Syria, we notice that it suffers from many damages inflicted upon it by the wear and tear of time, worsened by weather damages and neglect; this is especially true in rural areas, whereas some cities have lately started rehabilitation and maintenance programs to preserve their traditional architecture. In Aleppo, a program for the rehabilitation of the Old City of Aleppo has been initiated while a similar program has also been established to preserve and maintain the Old City of Damascus.

But these programs were only initiated after the housing stock had already suffered from damage and neglect. The traditional housing stock is now in need of considerable care and professional effort to reach a good level of restoration. Although a lot of effort is being put into rehabilitation programs, they still lack the experience and the know-how in rehabilitation techniques. However, the development process is steadily underway, and progress is being made to reach a good level of rehabilitation and expertise.

Cases are different for traditional architecture in rural areas and in Syrian cities: the wear of time has taken its toll of buildings which suffer from neglect and damages. Another important factor is a shortage of craftsmen and technicians specialized in traditional architecture, due to a development of new building techniques that neither use these traditional crafts nor support them. Furthermore, there is a tendency towards replacing the traditional building materials with newer, more durable materials that are faster to implement, but they lack quality, and do not fulfill all the requirements that the traditional materials and building techniques used to, such as thermal and acoustic insulation.

It was also noticed that, in some cases, the residents themselves didn’t want to use the traditional architectural forms. This was either because they wanted to follow modern lifestyles, or because of high renovation costs, or was a result of their ignorance in rehabilitation and rebuilding techniques. In addition, most of the experienced builders and craftsmen in the traditional forms have left Syria for different reasons; this has been a major setback for the continuity of traditional crafts.

Therefore, more light must be shed on this problem and more attention should be focused on traditional architecture in the city and the countryside, and experienced work teams should be assigned and trained to maintain and rehabilitate traditional buildings according to suitable rehabilitation techniques.

Other elements were also replaced: for example lime rendering is often replaced with cement plaster, because lime rendering takes time to prepare, hydrated lime must be made, plaster is slow to prepare and needs time to set between two applications. Cement plaster is quick to prepare, apply and dry but in the end, lime rendering is still the best quality material for a use on traditional buildings, allowing for the structure to breathe and for the humidity to migrate out from it.
The Legislative Framework

Legislation

Syria has had a relatively long history with ordinances related to protecting historical buildings. However, for the most part the legislative mandate was limited to protecting monuments and archaeological materials. Starting with the Ottoman Code of 1884, the main gist of the law was to protect artifacts and buildings of historical nature. The Arabic word that was used subsequently for all the historic preservation codes is “athar”, literally denoting traces of ancient civilizations. The actual connotation of the word (as codified through practice and subsequent codes) came to mean ruins, ancient artifacts, i.e. artifacts of old human activities. This specific limitation of the definition led to an exclusion of living heritage as worthy of protection: a limitation that has only recently been addressed.

The first specifically Syrian antiquities law was issued in 1938. Along with issuing the law and subsequently, a catalogue of classified individual monuments was thereafter issued. This first list remains an important reference for the country's inventory of historic buildings today. The law was amended and some implementation ordinances were issued, yet the main framework remained unchanged till 1963, when law number 222 was issued to chart the current public policy with regard to protecting and documenting antiquities. The law was slightly amended in 1969, 1974 and 1999. However, law 222 remains the main regulatory legislative device for protecting cultural heritage related artifacts.

According to law No. 222, heritage materials must be more than 200 years to be accepted as heritage and therefore to be placed under protection. Exemptions from the age statute are possible on decision of Antiquities Authorities for materials of particular historical and artistic significance. Antiquities materials are divided into two main categories: movable and immovable. Built heritage falls mostly in the second category. Architectural heritage can be archaeological sites, individual monuments or old neighborhoods. The classification of immovable antiquities is justified by claiming technical and artistic qualities, or due to important historical events. Area conservation is only made possible by stretching the definition of historical neighborhoods as mentioned in the law, albeit the term holds a significant urban bias.

Though the law does not require the expropriation of built heritage into the public property domain, it clearly encourages the transfer of public monuments to the Antiquities Authorities and provides these authorities with power to expropriate antiquities sites. In reality, and due to limited funding, the majority of public funding for preserving heritage sites was limited to buildings owned by the Antiquities Authorities. More specifically, the Directorate General of Antiquities and Museums (DGAM) became both a provider for public funds for preservation but also a bureaucratic hurdle for private investments into preserving historic buildings.

The attention to area conservation was begun in earnest only after the admission of the old cities of Damascus and Aleppo into the World Heritage List in 1986. The incorporation into the World Heritage of two Syrian urban sites allowed the practical application of the concept of historic zones and clusters for the first time. Several other cities followed. Historic districts in Homs, Hama and Jabla were considered in new light. In cities with no demarcation of historic zones, individual buildings were increasingly considered as part of their context. The DGAM became increasingly more sensitive to the issue of cultural and historic contexts of built heritage.

Along with demarcating historic zones, the law allowed for the elaboration of special protection codes and supervisory bodies to oversee and preserve these areas. Thus, each of the registered historic zones was put under the supervision of an ad-hoc committee known as the Protection Committees. These committees were mostly formed through prime ministerial decrees, emphasizing an executive approach towards administering the sites. Each Committee is formed with representatives including the main public authorities concerned (Antiquities, Tourism, Culture, Municipality, and Religious Endowments) as well as some other public or private stakeholders. Furthermore, these committees were given the authority to prepare conservation guidelines, building codes and other required ordinances (subject to approval from the concerned Ministries). Each site was to be administered locally under the chairmanship of the local governor. The local approach was designed to facilitate identification each site's needs and conditions. However, as the resources available for conservation know-how were limited, many of the local codes for urban conservation were copied after that of the historic district of Damascus, the capital city. Thus, Decision 39 of the Aleppo Council defining the building code in Old Aleppo was mostly modeled after that of Damascus, and that of Jableh, for instance, was a blend of the two.

The issue of urban conservation is often discussed under the framework of historic preservation. However, another set of legislative codes is equally important, mainly that of Urban Planning. For the last three decades Syria has been trying to stream line the process of Urban Planning and the production of legally binding master plans. The main law governing this process (law No. 5 dated 1983) sets in place the procedures needed to design and ratify master plans. These procedures are highly cumbersome to the point where most small municipalities would not be able to be able carry them independently. To that extent, the bylaws established a system whereby master plans are drawn through regional technical bureaus, and reviewed through Regional Technical Committees.

The quantitative success of ratifying several thousands of small community masterplans came at the expense of quality and the preservation of local building traditions and character. The planners hardly ever visited the sites of their masterplanning projects. The pressure of time often was an overriding pretext to ignore some key guidelines produced by the Ministry of Housing in 1970 under the rubric “Designing Masterplans and the Planning Principles”. These guidelines mandated a serious documentation of existing building patterns and methods and speculated as to the need of establishing special zones for rehabilitating
The Legislative Framework

and preserving areas of special traditional and historic character. The guidelines, however, carried little enforcement as they were merely a Ministerial circular and did not amount to the legislative power of Law. Law No. 5 governing the planning process refers to these guidelines but does not go to details about preserving areas of special character. In reality and through actual practice the Ministry of Housing pushed for the ratification of several thousands detailed masterplans without due consideration of preserving historic and traditional building zones. Furthermore, as pressure for ratifying the plans was mounting a standard building code was attached to the new master plans regardless of its applicability in specific sites.

The results of applying the planning law were beneficial to many locals in terms of clarifying future urban projects (primarily rights of way). However, the new plans and corollary building codes were not compatible with local conditions and often led to wholesale demolition of areas with special building heritage. Even larger cities were subjected to this haphazard planning process and many historic neighborhoods in Damascus, Aleppo, Homs, Hama, and Lattakia were demolished to make room for modern style downtowns. It was not till the Ministry of Culture decided to register historic areas that the tide began to reverse. Nonetheless, the masterplans were not automatically reversed but were put on halt. Only Aleppo has managed to initiate a reversal of the old masterplans and to initiate a new plan that would respect and preserve its historic core (see below). In other words the conflict between the legislative mandates of the antiquities law and the urban planning law has not yet been resolved (at least not through formal legislation that would affect more than one locale at a time).

Procedures for Protection and Classification

Listing of historic areas or historic buildings is made entirely at the discretion of the Directorate General of Antiquities and Museums (DGAM). The DGAM prepares proposals for listing. Each proposal contains a rapid documentation of the site as well as a written statement of importance. Eventually, a historic listing is codified through a decree from the Ministry of Culture ratified by a decision of the Higher Council on Antiquities.

A typical listing would include reference to the Cadastral Numbers identifying the plot(s) comprising the historic site. Demarcation of site boundaries is often dependent on old Cadastral records prepared during the 1920's and 1930's. The plots’ legal description is included in the list. However, as many of these records change over time, a precise definition of protected zones is sometimes blurred.

In theory, the Ministry of Culture through the DGAM has the power of eminent domain to expropriate sites deemed of great historical importance. This right is exercised with limited compensation for private owners of property. It has been applied infrequently only for highly important sites. However, the fear of private property owners of having their property expropriated often leads to a highly negative attitude attached to having one’s property listed. This is further reinforced by the fear on the part of private owners of overbearing historic preservation requirements. The DGAM in theory is supposed to provide subsidies for restoration efforts; however their limited budgets seldom allow it. In theory also, publicly owned estates should be transferred to the DGAM custody if their public custodians proved incapable of their preservation.

The first lists for historic buildings and sites were prepared in the late 19th century; attached to the Ottoman antiquities law was a list of sites deemed important historically. Throughout the mandate period, (1920-1946) an extensive list of individual buildings was prepared for the main urban monuments and archeological sites. In the post independence era, the DGAM has continued to prepare such lists incrementally. Listing of historic areas and zones commenced in earnest in the late 1970’s with the inclusion of large urban tracts as historic zones.

Once a building or a zone is listed, the cadastral records for the plots affected are modified to include a legal juncture of historic protection. The local authorities consult these records prior to any planning work and before issuing building permits. The juncture would require the approval of the local DGAM branch before any public or private work is allowed. The DGAM also organizes inspection routines to verify the adherence to protection ordinances.

It should be noted that a listing of a building or a site carries with it an automatic definition of a protective buffer zone. Though construction work may be permitted in that zone, it is required to obtain the DGAM approval for such constructions. Compatibility of style, mass and materials is often mandated. The definition of such a zone is not specifically announced in the listing decree; however, the affected plots are marked in the cadastral records as being part of the buffer of the listed building.

The law proscribes sever punishments for abusing, defacing or demolishing listed antiquities. Both fines and jail terms are defined for violations. The local DGAM branches have several tools at their disposal to insure the protection of listed buildings. These tools involve the cooperation with local municipal authorities for the physical removal of violations, the cooperation with local police to initiate legal juncture against violators, and the provision of in-house guards for important sites. It should be noted that the law mostly operates on the basis of deterrence for safeguarding
the built heritage. Provisions for investment into rehabilitation needs are poorly defined in the law.

**Stakeholders**

The main protagonist involved in the preservation of built heritage is the DGAM. It belongs officially to the jurisdiction of the Ministry of Culture. It has a hierarchical structure with a director general in Damascus and branches in the Governorates. The headquarters of the DGAM are authorized to set national policies, regulate major interventions, prepare final budgets, approve restoration projects carried out directly or to be supervised by the DGAM, and prepare protection decrees to be issued by the Ministry. The local branches supervise the issuing of permits, guard listed sites, design and implement restoration projects financed by the DGAM. In general all major and critical decisions are deferred to headquarters, as most of the competent experts working with the DGAM are located in headquarters. The Ministry of Culture is one of the least endowed institutions in the country. With a total personnel count not exceeding 4000 employees (more than 50% have not completed high school) the capacity of the Ministry is in no position to support the complex and demanding mandate of its largest department: the DGAM.

Another important institution concerned with antiquities is the Ministry of Awqaf (Religious Endowments). Awqaf is the Muslim system set to provide for sustainable financing of religious activities and social charities. Throughout history, pious Muslims donated their properties for the cause. Revenues from endowments were used to support charitable activities and to preserve, maintain, develop the endowments and ensure their sustainability. In 1949 the Syrian government cancelled individual endowments and grouped them under the guise of the Ministry of Awqaf. The Awqaf became the single largest landholder in the Country. Funds were collected centrally and the Ministry redistributed them for supporting charitable and religious activities as well as rehabilitating and developing its real estate stock. Awqaf is particularly strong in historical urban zones, but also commands a large portfolio of investments in peri-urban sites. Because its status as a main landholder as well as being a well-endowed public institution it is often included in the formation local Protection Committees.

The municipal councils in Syria hold a wide range of jurisdictions under the Local Administration Law of 1971. Particularly, they hold an executive role within their jurisdictions. The DGAM delegates may request their assistance for the implementation of many tasks related to removal of violations and asserting protective buffers to the local administration units. The Ministry of Local Administration is the most endowed public institution it commands over 10% of the national budget and approximately the same percentage of civil servants. In major cities the Municipal authorities have their own technical departments. The smaller units depend on regional technical services provided by the Governorates. Implementation of urban policies and strategies (including historic protection ordinances) is carried out by the local administrations units. Therefore, they feature prominently in all Committees related to protecting historic zones. In the major cities, the Municipalities hold their own routine inspections into historic zones and provide for the maintenance and rehabilitation of public spaces and infrastructure. The private citizens are of course directly concerned with the status of their property. The Law does not deprive them of the lawful ownership and use of their property. However, often the development of the property is subject to highly bureaucratic procedures and cumbersome restrictions. The usurping of development rights on private property as a result of historic listing is not generally compensated by the DGAM. A listing of a private property signifies a short term devaluation of the property. The long term advantage is not immediately appreciated by private residents, leading to a general resentment and antagonism towards antiquities ordinances and authorities. This trend is in the process of change as the tourism potential of historic property is being discovered and nurtured.

The Ministry of Tourism has recently come into the picture as a strong protagonist and advocate for developing historic zones into tourist destinations. The Ministry has both the role of a promoter as well as regulator of tourism activities. It has also recently discovered the advantage of promoting sites of vernacular architecture as a potential for attracting tourism. Its role in identifying such sites is increasingly more prominent.

**Financing**

Direct funding for preserving and developing historical sites is rather limited. The DGAM commands slightly less than 0.1% of the national budget. Its budget is barely sufficient to keep up with running costs. Small provisions are available every year for restoration projects in sites owned by the DGAM. Major restoration projects are often carried out by discretionary funds earmarked by the central government.

The Ministry of Awqaf provides a substantial rehabilitation budget for their properties. However, these funds are mostly directed to protect and preserve the religious monuments. Tenants in houses owned by Awqaf are seldom supported to carry rehabilitation on their homes. In reality, the Awqaf has adopted a policy of privatizing their residential stock.

The Ministry of Tourism carries out small projects aimed at preserving particular sites and promoting traditional crafts and trades. Their direct investment into this realm is limited though; the Ministry plays more the role of a facilitator than a direct financial provider.

The Real Estate Bank of Syria is the state owned bank with the partial mandate of financing tourist oriented projects. It provides medium and long term loans for investments in the tourism sector. It has enabled many projects in historic zones from taking place, albeit it has played a discriminatory role against vernacular houses. The REB policy regards vernacular architecture as unsafe collateral for its loans and refrains from issuing loans for financing traditional buildings’ purchases or restoration efforts.
International donors have contributed significantly in the past for the preservation efforts of particular historic sites. One such case is described below. Increasingly local authorities are learning to coordinate efforts with the State Planning Commission to direct International Donor funds into the realm of historic preservation. The DGAM also receives many grants for the purpose. However, given the magnitude of the task at hand, these funds remain short and provide for a limited, albeit important role of capacity building and human resource development.

Recently, rural development has entered the spotlight through the activities of newly emerging organizations such as the Fund for Integrated Rural Development of Syria (FIRDOS). Through participatory measures aimed at providing subsidies, loans and technical assistance, the Fund is enabling rural communities to implement rural development projects both in the public and private sectors. FIRDOS has consciously adopted a position of preserving rural heritage and supports efforts to use traditional building techniques for implementing its projects.

**Rehabilitation Projects: Examples**

Examples of rehabilitation projects involving large historic zones, as opposed to restoration projects of individual sites remain limited in Syria. One prominent example is the case of the Project for the Rehabilitation of the Old City of Aleppo discussed below.

The City of Aleppo is today an important regional metropolis of some two million inhabitants. It commands a considerable proportion of economic activities in Syria. Set as a major trading post in the midst of a largely agricultural hinterland, the city secured its livelihood continuously for the last five thousand years. Its medieval core of traditional masonry buildings still bears witness to past glories. Doted with hundreds of monuments and extending over 350 hectares, the old center of Aleppo still boasts a living community of 110,000 residents and over 25,000 daily jobs.

Between 1954 and 1978 the old city was subjected to a series of modernizing master plans. Major streets cut across its urban fabric, high-rise buildings towering over the old neighborhood, out migration of the affluent to the new parts of the city, and systematic neglect of maintenance, severely affected the Old City. Inner-city problems were resolved in a typical modernist way by large-scale clearances.

In the late 1970’s preservationists managed to halt further demolitions by resorting to the Ministry of Culture to register the urban fabric of Old City as a national monument. In 1986 the Old City of Aleppo was recognized as a World Heritage Site, and in the subsequent years, the Municipality of Aleppo sought funding to initiate a rehabilitation program for its historical center. In 1992 the German Government and the Arab Fund for Social and Economic Development agreed to join efforts with the Municipality of Aleppo. The German Agency for Technical Cooperation (GTZ) was assigned by the German Government to administer its contribution (13.5 Million DM to date), and the Arab Fund limited its contribution to technical assistance (2 million US $ to date). The Municipality of Aleppo established the Project for the Rehabilitation of the Old City of Aleppo to administer the affairs of the Old City; later a special Municipal Department was given this mandate.

The Project charted its methodology in a Development Plan: a flexible planning system with emphasis on defining objectives and strategies rather than rules and regulations. The planning approach was concerned with relating historic preservation issues to the various aspects of urban management including land use regulation, housing, technical infrastructure, environment, traffic, social services, public participation, as well as the concern for monument preservation. Many of these issues fall outside the normal operations of the Municipality. Indeed, other governmental agencies and non-governmental organizations became directly or indirectly concerned with the future planning of the Old City. This comprehensive approach enabled the materialization of a wide range of experiences but mostly was essential in insuring the commitment of concerned parties to the rehabilitation process. Two types of planning devices substantiated the Development Plan. On the one hand, sectoral issues were detailed in Subject Plans. These included primarily citywide issues such as traffic, environment and urban economy. On the other hand, abstract issues needed clear implementation parameters. These had to be localized in concentrated zones to insure visibility as well as synergetic effects. These zones were prioritized within Action Areas.

The key planning objectives focused the planimetric data into specific categories, such as land use, urban economy, housing and social conditions, traffic, environment, infrastructure, historic monuments’ preservation, and public participation. The focusing of data into particular categories was crucial in later stages to develop the data management programs into a
Developing spatial strategies needed to be sensitive to the actual history of the urban fabric. Urban fabrics evolve historically using a variety of coercive and negotiated processes. The spatial hierarchies of the old city often fell victim to the top down directives of modern planning. These directives often neglected the spatial order of the traditional fabric of the neighborhood, and tore apart its social relations. Rehabilitation efforts needed to concentrate on re-establishing the spatial networks as they are attempting to preserve the physical structure of the city. To this end, the logic of zoning entire city blocks under one zoning category was rather unproductive. Instead, spatial hierarchies were reintroduced to the public space of the street as a socially viable basis for zoning.

Two spatially instrumental strategies were used: quantitative and qualitative land use plans. The need to establish both quantitative and qualitative parameters for urban management was necessitated both from a social needs basis as well as historic preservation requirements. The two aspects of spatial ordering enabled a flexible approach to deal with the peculiarity of historic areas while providing a reliable level of legally binding measures to insure preservation needs.

However, it should be remembered that legally binding land use plans are abstract documents; their effects are not tangible over short periods of time. Therefore, it was essential to reinforce their main objectives with a series of small interventions on the ground to reinforce the spatial hierarchies envisioned in the planning. These interventions were excellent opportunities to involve the local communities in the first level of participation in planning. These measures were as simple as the distribution of solid waste collection points (cleanliness campaigns), and as complex as urban design strategies aimed at visually improving various zones of the action area (action zones).

On a different scale, the action areas were excellent opportunities to build networks involving other agencies working on providing services in the Old City. Several action projects were initiated with the cooperation of the Awqaf (Administration of Religious Endowments), the Health Department and the Department of Education. These vary in scope from assistance to rehabilitate historic religious monuments to the provision of health points and kindergartens. The scope of the programs, limited as it may, was effective in substantiating the Project’s expenditures in the action areas but of foremost importance in establishing standard operating procedures for future programs in the Old City.

As part of the preliminary comprehensive surveys conducted in the Old City, it became apparent that a major cause for building deterioration was the leakage of the infrastructure networks. The water (sewerage as well as water mains) seeping under foundations caused foundations to settle in a differential manner and lead to structural damage in the buildings. Also, the water vapor rose, through capillary action, to high levels in the walls. This created many stone diseases, not to mention the unsightly problems with efflorescence.

Overhauling the infrastructure networks is an issue that cannot be restricted to the social and regulatory limits of the action areas. Instead, the catchment area for each sector had a physical reality of its own. Therefore, the implementation range of infrastructure had to be extended out beyond the action areas.

Through the implementation of new infrastructure projects many structural issues had to be resolved. Structurally unstable buildings had to be shored in a special way to avoid further damage, individual links had to be coordinated, and foremost, a continuous maintenance program had to be developed within the municipal budget to insure that the newly installed networks are properly and regularly maintained.

The housing stock in the old city suffers generally from poor maintenance. The structural conditions were such that public safety was becoming a major concern. An early program was initiated to assist the residents in their home repairs, especially when involving structural work (collapsing roofs, sagging foundation, and cracking walls). Revolving interest-free-loans were issued along with technical assistance and exemption from permit fees and procedures. The package was small but enabled many residents to invest matching funds and maintain their residences. The flexibility of the program constituted a major factor in assuring its success and wide popularity; to date some 450 homes were brought to stable structural conditions.

Some basic construction techniques needed for the rehabilitation of the old buildings have long vanished. The new generation of crafts’ people is not familiar with old construction methods. Some preliminary restoration projects were initiated on a deliberately low-level of technology to train contractors and skilled workers on the basic types of stone conservation issues. The provision of examples is a standing methodology for all of the Project’s interventions. However, in this case, a more lasting impact was designed in the form of a training center for restoration techniques. The program is developed as a learn-and-work program.

Finally, guidelines and books of standards were quite effective documents to insure immediate transfer of skills to other locations. Guidelines are more flexible for planning purposes but they were not effective to carry planning into implementation. Standard tender documents were very useful to cut down tendering red tape, however, they were not very flexible to handle special cases in the Old City. Bridging this gap was only possible by training staff and local experts to use both types of documents; this process was not formalized but should have been part of the qualification program.

As it has become apparent, the rehabilitation process is a complex operation involving many stakeholders and a variety of tasks other than monument restoration. The Project for the Rehabilitation of Old Aleppo has undertaken many of these tasks and tried to incorporate other players to join in the process. The approach was often criticized for not directly expending limited resources into the direct preservation of historic monuments. The ethical stance from which the Project has undertaken its operation was that the primacy of intervention should be to set the ground for a sustainable process in all its aspects: institutional, economic, environmental, as well as social.
The Diagnosis: A Preliminary Stage to any Restoration or Maintenance Operation

Traditionally, building materials, particularly stone, sand, earth and wood, are sought in nature near the construction site. Limestone is used in construction: it is a hard material that resists well to strain and compression but is sensitive to dynamic strains produced by use, overloads and earthquakes. Wood is also an excellent and necessary material, as it withstands bending and tension strains. All these materials are sensitive to water and other climatic factors.

Throughout the history of construction, we find restoration and maintenance campaigns, carried out by owners or their representatives (architects, master masons, carpenters...) to adapt the construction to the living conditions of the time. Constructions lost some of their original characteristics or were affected in their historical, architectural and cultural values when new materials emerged at the beginning of XXth century, bringing about aggressive construction or rebuilding processes. A good operation must both maintain the good architectural condition of a building and preserve its value. This operation is only initiated after several general disorder diagnoses are carried out.

An overall vision is essential to make the operation coherent and to make it comply with the objectives. Each restoration or maintenance project requires preliminary studies to understand and master a building’s specificity and construction elements. This methodology, or diagnosis, requires logical steps: from a simple inspection of the obvious deteriorations to a detailed diagnosis, setting up all the stages of restoration or maintenance, during the actual works and beyond.

The stages that should be followed in any diagnosis are:
- A preliminary diagnosis: to make a first evaluation of the condition of the building and defining the various fields and tasks that could be involved in the project, during this first visit.
- A multidisciplinary approach: to collect all the information, tests and analysis of the deteriorations in the building. These elements will guide the future operation.
- The diagnosis: to analyze the information of the multidisciplinary tests and determine the needs in restoration or maintenance. This program defines the repair and consolidation works for the existing structures, as they stand, and the improvements that should be brought to the deteriorated elements.

Preliminary Diagnosis

During the first visit of a building, after an overall visual inspection of deteriorations including their position, nature and dimensions, one can estimate the building’s state of preservation. This estimate is the stage of preliminary diagnosis making it possible to classify the building according to its condition and deterioration level. Indeed, a building which has lost its structural stability cannot be inhabited before a full rebuilding operation.

However, an inhabited house suffering from minor distortions can be improved through maintenance works, and thus contribute to developing the life standards and comfort of its inhabitants.

This is why multidisciplinary inspections are essential, to list the condition of these structures: they establish a diagnosis that identifies the origins of the deterioration of and draws up a priority list of urgent operations.
Multidisciplinary Inspections

The better one knows a building, the better one accomplishes successful maintenance or restoration. Understanding is the key to designing hypotheses on the nature of deteriorations, enriching historical research, and determining the best suitable maintenance or restoration approach. This provides not only the economic and technical preservation solutions for constructions, but the best conservation solutions as well.

A multidisciplinary approach consists in providing a full range of results, studies and various analysis, to gather all the necessary information to constitute a diagnosis. This includes a historical and documentary study, a socio-economic study, a architectural plan, a detailed inspection of the building, a construction and structural analysis, "in situ" (on the spot) tests and in laboratories.

A Historical and Documentary Study

A diagnosis process usually starts with a history of a given building. This includes:

- Texts and accounts which describe the architecture of the house, its layout and plan, its use, the number of floors (storeys), the constitution materials used, a description of its environment, etc.

- Any old graphic documents (plans, cross sections, additional works, land register, etc...), available in a municipality or registration offices. Old photographs of the inside or outside of the house help check the state of the house at that time. Drawings (sketches, watercolors, pencil drawings, etc.), old aerial photographs of a city, village or area in which the house could appear.

This research can lead to the identification of the original house, its transformation and evolution: factors which define its architectural environment today. Indeed, a house in its current state is the result of a continual change of inhabitants, of a residential environment bearing the marks of the various inevitable interventions and changes brought by those living in the area.

A Socioeconomic Study

The inhabitants of traditional houses often left their residence at the beginning of XXth century to move into suburb buildings with the luxury and comfort of modern life. The old homes were then inhabited by people who did not have the means to keep them up or by people who moved into abandoned dwellings. In both cases, the traditional house is generally inhabited by people with low income, or who can’t afford to maintain it. Traditional houses are however still often inhabited by the same family, who carried out improvement works according to their wish for comfort and their income. Thus, a traditional house undergoes damages from lack of maintenance and/or ill-adapted add-ons or unsuitable modern installations.

The Graphical Survey

The graphical survey does not only consist in noting the exact measures of a building on a chart, but is a way of identifying all the flaws and problems of a construction to better understand and analyze it. There are several types of surveys: the architectural survey, the diagram of deteriorations, the technical survey which describes the materials used and related techniques, the various installation surveys and the accesses of the building.
- The Architectural Survey

The architectural survey depends on representing the existing architectural element with drawings, explaining its composition, dimensions, proportions and geometrical shapes, its construction mode, its historical development and its aesthetic and functional value.

It is a scientific operation that requires a series of investigations, from the reading of the original concept of the construction to studying all the maintenance or restoration works, and then interpreting its current formal and spatial aspects.

The drawing must show the information as best as possible: clearly, precisely, with a key, explanations and possibly even foot notes. This survey must at least include plans, cross sections, vertical sections, and, if possible, three dimensional views, with perspectives or axonometry.

- The Diagram of Deteriorations

The diagram of deteriorations shows the alterations and damages. The walls and the floors bear the visible marks, the origin and size of the cracks. They allow to better understand the origins of the alterations and causes of deterioration. This diagram gathers full comprehensive data, specifying the damages, cracks, the angle or swelling of the walls, the traces of moisture and stains, etc, clearly showing their position, direction and dimensions. This quantitative and qualitative information makes it possible to check the condition, the stability and deterioration level of a construction at the time of the diagram.

- The Survey of the Materials Used and Realization Techniques

This survey consists in noting the construction materials of the building: their nature, dimension, physical and mechanical properties, their state of preservation (wear and tear) and exposure to deterioration factors (climate, pollution, structure movement, etc.)

This survey also indicates the materials used in the various stages of an operation. Realization techniques reflect the skills and proficiencies, the know-how expressed at each stage of maintenance or restoration, and the influence of new materials on the original construction. After a century of use, concrete shows its limits and dangers when used on old stone structures. Inappropriate materials sometimes cause visible flaws when these maintenance materials do not have the same physical or mechanical properties as the original ones.

- The Survey of the Various Systems

From the first day, an inhabitant modifies his house to adapt it to his needs and wishes in terms of comfort. This survey focuses on the parasitic constructions and installations on the original construction. An analysis of this diagram leads to pointing out the physical and aesthetic alterations, the add-ons inflicted onto the traditional house.

- The House’s Environment

This survey shows the relation of a house to its environment, casting light on the effects this environment has on the preservation and condition of the construction.

It lists the nearby industries and their effects (smoke, air pollution, acid rain, etc.), the sea (level of moisture, salt concentration, etc.), and road networks, railroads, airports (vibration, pollution, noise, etc.).

Inspecting the Damages of a Building

Most deteriorations are inspected visually. Indeed, the trained eye easily detects the origin of damages according to the shape and the nature of a deformation and knows how to evaluate such distortions. A systematic approach contributes to easing an inspection, it uses accurate measuring instruments and starts with a general overview and then goes into the most detailed aspects. This method starts with the inspection of:

- The façades which exhibit the construction’s characteristics at the various stages of construction and the influence exerted on the preservation and the stability of the old structure.
- The properties of the construction materials (stone, earth, wood, lime or earth mortar, wooden structure, etc.), their size (wall with one or two linked facing, thickness and height of the walls, etc.) and their realization process (stones laid on a bed of lime mortar, stone masonry laid in lime binding material, header binder bolder laying, earth wall with wooden framework, lime or earth rendering, etc).

- The condition of the roofing and its construction system (vault, wooden floor, wooden frame, etc.), as well as an inspection of the pipes for rain water and drainage. This inspection includes a checking of their capacity, slope and connection to public network systems.

- New installations and their influence on the old structure (electrical and sanitary systems, antennas and parabolas, new building materials).

- Conditions of comfort inside the house, hygroscopy (relative humidity level, percentage of water, level of ground water, etc.) and acoustic levels (nearby roads, railroads, factories, etc.).

Construction and Structural Analysis

A series of inspections must be carried out so as to identify the structural distortions of the old building. Most anomalies are inspected visually: a first visit of the building can detect major damages on façade walls, interior walls and terrace.

In case of doubt about a structural problem, it is necessary to use measuring instruments to check the damage once per season, to detect structural movement, to track the origin of a problem and ensure a follow up after damages are repaired.

The systematic analysis or diagnosis of deteriorations requires a stage where one evaluates the general stability of the building and the preservation of its construction materials.

- On the Spot, "in situ" Tests

A visual inspection can be completed by continuous monitoring which uses several non-destructive "in situ" measuring instruments. The various strains exerted on an old structure can be evaluated by calculating downward loads and determining the dynamic strains which indicate the position, direction and size of deformations.

- Laboratory Tests

In a laboratory, the physical and mechanical properties of building materials can be analyzed on core samplings. This method measures the compressive and bending strengths, the porosity of a material, deterioration depth and permeability levels (hygroscopy, water percentage, condensation). Other tests can be carried out in the laboratory to identify the nature of stains and/or deteriorations.

- Tools for Inspection

For basic measurements taken by an architect with a master mason, the main tools are:

1. to collect the data:
   - A drawing tablet, tracing paper, graph paper, a pencil, an eraser, pens in several colors, etc...
   - Inspection Cards, graphic plans, cross sections and vertical sections to mark the various distortions and the minutes collected on the building site.
   - A camera (preferably digital).

2. to draw up an architectural survey
   - A 5 m measuring tape, a 50 m decametre measuring tape, a 50 m decametre measuring tape, a telescopic meter, a laser meter.

Controlling the evolution of cracks is always advisable.
The diagnosis: a preliminary stage to any restoration or maintenance operation

1. to determine level - A water level instrument, a manual level instrument, an optical or laser level, a plumb line.
2. to facilitate observation - A protected light with an extension cord.
3. to magnify - A magnifying glass.
4. to sample - A stool, a ladder, climbing technique or means.
5. to detect cracks and moisture - A hammer, a steel stiletto, a sclerometer, chisel, core sampler etc.
6. to sample - Plastic bags for samples and adhesive labels.
7. to detect cracks and moisture - A gauge to measure and follow crack movement.
8. to measure humidity - A hygrometer to measure the humidity contained in masonry.
9. to measure temperature - A termo-hygrometer to measure the temperature and the relative humidity level in the air.
10. to identify chemical composition - Reaction chemicals or products to determine the nature of crystallized salts on the surface of stones or lime rendering.

The materials of a traditional house can be subject to many tests which contribute to identify and list the nature and origins of deteriorations. In a classified building of great historical value, it is more economical (in the long run) and technically more scientific to install continuous measurement analysis and testing systems to evaluate the slightest structural changes. In traditional houses, simpler processes must be used to make the necessary diagnosis and identify deterioration. This is why visual controlling by an experienced professional with the right know-how can considerably cut down costly tests and long breathed analysis. However, there is no doubt that it’s necessary to carry out in depth tests.

**Diagnosis**

The analysis of all the data collected contributes to drawing out a good diagnosis, thus determining all the causes for deterioration and finding the suitable solutions.

The nature of an intervention is decided according to the amount and degree of deterioration detected in the preliminary investigations: restoration or maintenance, completion time frame, and task force involved (owner, architect, expert, etc.).

Several tools are at our disposal to improve our knowledge and understanding of a construction

These data sheets enable a quick assessment of the condition and level of maintenance of a construction. Their purpose is to identify the main constructed elements, to describe them and check whether or not they are properly functional. The data is collected during a general visual inspection of the building. The sheets are a reference guide, a framework. The following checklist is only a rough example:

**1 - The Structure**

**Vertical:** Assess the foundations, overhangs, cracks, or other damages, as well as load bearing posts / pillars of walls and facings. Identify the different types of materials and apparent pathologies.

**Horizontal:** Assess the sagging of beams and floors, the solidity of arches and vaults, the presence of cracks, rotting, insects, wood, brick or ceramic crumbling.

**2 - The Roofing**

Check if it provides suitable waterproofing and protection, without leakage, infiltration or thermal bridge. Also check external surfaces, peeling or possible porosity, as well as a possible faulty drainage system (clogged, obstructed or rusted gutters and pipes...)

**3 - The Façade**

Assess the various elements of the façade, first on a structural and safety level: the question is to determine the risk of peeling, and consequent collapse onto public streets. Then itemize observations and assess the condition of each separate element: structure, balconies and volumes, cornices and roof overhang, guardrails and window ledges (check fixings and deterioration level), coatings and decorative elements (poor fixing, peeling, porosity, wear, mould, pollution...), joineries (fixings and condition, insects...).

**4 - Interior**

Evaluate the degree of deterioration and comfort conditions: Acoustic, thermal, and moisture (infiltrations, condensation and capillarity).

**5 - Systems**

Check the safety condition of the various systems: water, gas, electricity wiring and drainage.

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<th>BUILDING DATA SHEET</th>
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| MATERIALS | |
| - Stone | |
| - Brick | |
| - Ceramic | |

| SYSTEMS | |
| - Plumbing | |
| - Electrical | |
| - Heating | |
| - Air conditioning | |

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<td>4 - Interior</td>
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<td>5 - Systems</td>
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Regular Maintenance is the Only True Guarantee for a Traditional House

Buildings are subject to a permanent process of physical deterioration through use and from the effects of the external environment. Buildings, in spite of their solid appearance and sturdy components, are actually quite sensitive to climatic factors (sun, rain, temperatures fluctuations) and to other natural forces. Normal use by inhabitants is also one of the causes for the progressive deterioration of the various elements of a house.

Need for Maintenance

The needs and activities fulfilled in our traditional architecture are subject to constant change. From time to time, works of restoration and maintenance are normal: buildings have to adapt to the many changes in needs along with changes in mentalities, habits, fashion, technical requirements or legal statuses, as well as production constraints, use or comfort.

When we speak of maintenance, we speak about the most significant actions for the preservation and the modernization of our traditional architecture. These actions, whether periodical or frequent, ensure the protection of the building through the ages and adapt it to the activities developed within. We must distinguish two points: common maintenance, whose goal is the preservation of a minimal functional capacity, and modernization works which adapt the house to constantly changing modern standards.

Maintenance Today

From the moment it is completed, a traditional house is in need of maintenance: this can be carried out by the owners themselves or by professionals: a master mason and/or other building arts craftsmen.

As far back as the XVth century, the Italian sculptor and architect Il Filarete, in his “Treaty of architecture”, said: “You may say: a building does not grow ill and die like a man. And I would answer yes, yes it does: it grows ill when it does not eat, in other words when it is not maintained, and it perishes with time in the same way as a man who fails to eat is sure to die.”

In the past few years the owners grant more and more importance to the maintenance of their perpetually changing old houses. There are several reasons for this, namely:
- A growing awareness of owners: that maintaining a house daily is better than having to carry out heavy works every other year.
- Maintaining all household systems in good condition ensures better safety and hygiene for all inhabitants.
- Owners are more attached to the patrimonial value of their houses and feel more responsible in protecting them against climatic risks that could damage elements or structures.
- Lack of financial means to build a new house and higher costs of new buildings.

The Role of the Owner

The owner is the first person who can detect problems or pathologies in his construction. Considering his lack of means to intervene in any significant maintenance work, he can help establish a good diagnosis, and specify the nature of the task and the type of skilled labor required to carry out the works.

Daily maintenance can be completed by the owner himself: cleaning, minor joinery or ironwork repairs, upkeep of the rendering and ramming of earth terraces, lime or earth wash, replacement of deteriorated stones, etc.

In more significant works, the owner must call upon an expert to solve specific problems or to evaluate the preservation state of his property.

Besides, managing a traditional house requires knowledge and specific maintenance methods. Indeed, what is at stake is not only fixing momentary problems but managing the whole estate, getting the best out of the building in its various aspects: use, preservation, historical and cultural value.

A Guidebook for Maintenance

For an effective diagnosis, all the data and information contributing to a better knowledge of the building must be gathered in order to create a technical guidebook, a data bank, to define a maintenance program. This program, or maintenance guide, will both keep a record of the risks and construction defects, and plan preventive or corrective maintenance works. This program will be consulted before any action is taken on the building.
The objective of this guidebook is to:
- ensure the maintenance of a building to prevent deterioration,
- facilitate future diagnosis operations,
- better know construction materials and their lifespan, structural systems and traditional techniques,
- facilitate the follow-up of one or more daily maintenance actions.

The maintenance guidebook will be the tool and reference book containing all the technical and historical information, the visually detected deterioration, the damages and repairs carried out on the building, and an identification of the actor (owner, expert, workman, etc.).

This guidebook will keep a record of the state of the structure, it will help organize an agenda for periodical maintenance and set up preventive preservation works.

**Preventive Maintenance**

Knowing the nature and the lifespan of construction materials, determines regular maintenance, helps reduce deterioration and maintain architectural heritage in as good condition as possible.

Periodical inspections detect pathologies or structural deterioration before they worsen. Thus, preventive maintenance limits damages and great spending in heavy restoration or maintenance operations.

After works of rehabilitation, a maintenance program should be established to schedule periodical inspections, a cleaning of the materials and a control of the structures. In preventive preservation, this approach and guidebook contains the information for users to know their house, understand its elements. It guides them in taking precautions for particular situations, in looking after fragile structures which could be damaged in the event of misuse.

An overall view is essential to carry out coherent works and fulfill objectives. It is not easy to determine what must be carried out first, or chose this type of maintenance rather than the that one: this is when it is essential to choose the best qualified labor in traditional building arts; certain maintenance works require high level expertise. The objective of this program is to act upon an old building solely in the respect of its historical and architectural value. Good maintenance keeps a building in good condition and preserves its architectural and patrimonial value.

**Various Levels of Maintenance**

- **Proper Use**
  Proper use constitutes the first way to cut down on maintenance and prolong the lifespan of a construction. Know your house well and use it intelligently.
  Simple advice can help:
  Do not slam doors, ventilate well every morning, shut windows before a storm, use the right cleaning products, etc.

- **Maintenance**
  The various elements of a house age and wear differently; each has its own characteristics and life cycles: metal can rust, wood can rot. Their protection must be maintained, repaired and renewed after a certain amount of time.
  The maintenance of certain elements must be entrusted to professionals: boilers, chimney sweeping, roof cleaning, etc.

- **Repairs**
  Whatever the quality, use and maintenance, a breakdown is always possible. The solution is sometimes simple, like replacing a fuse, or can be hefty and require a specialist.
  Repairs include solving problem and making something work properly: fixing a piece of equipment, treating the corrosion of a piece of metal, fixing a broken tile or unblocking a sink.

- **Restoration**
  However careful maintenance may be, and however quickly repairs are carried out, there comes a moment when wear and tear & time call for restoration: this is when certain elements must be replaced or certain works must be carried out.
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