



T.C.

ÇANKIRI KARATEKİN UNIVERSITY

INSTITUTE OF FINE ARTS

DEPARTMENT OF ART AND DESIGN

**EMPLOYING MESOPOTAMIAN ORNAMENTS
IN PRECAST DESIGNS IN IRAQ**

LEITH ABBAS ABD ALAMEER AL-RUBAYE

MASTER'S THESIS

Supervisor

Prof. Dr. Ersoy YILMAZ

Çankırı-2022

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Leith Abbas Abd Alameer AL-RUBAYE
ORCID: <https://orcid.org/0000-0002-3256-8229>

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Supervisor

Prof. Dr. Ersoy YILMAZ

Second Supervisor

Prof. Dr. Ali Hamood TWAIJ

Program: Art and Design-English

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SCIENTIFIC ETHICS STATEMENT

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

04/10/2022

Signature

Leith Abbas Abd Alameer AL-RUBAYE

TEZ KABUL VE ONAY

ÇANKIRI KARATEKİN ÜNİVERSİTESİ GÜZEL SANATLAR ENSTİTÜSÜ

Leıth Abbas Abd Alameer Al-Rubaye tarafından hazırlanan *Employing Mesopotamian Ornaments in Precast Designs in Iraq* başlıklı bu çalışma, 04/10/2022 tarihinde yapılan Tez Savunma Sınavı sonucunda oybirliğiyle/oyçokluğuyla başarılı bulunarak jürimiz tarafından Sanat ve Tasarım Anabilim Dalı Sanat ve Tasarım-İngilizce Programında Yüksek Lisans Tezi olarak kabul edilmiştir.

TEZ JÜRİSİ ÜYELERİ

Danışman : Prof. Dr. Ersoy YILMAZ İmza:

Üye : Doç. Dr. Orhan VAROL İmza:

Üye : Doç. Dr. Mustafa Gürbüz
BEYDİZ İmza:

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Prof. Dr. Ersoy YILMAZ
Enstitü Müdürü

FOREWORD

I would like to extend my sincere thanks and appreciation to Prof. Dr. Ersoy YILMAZ and Prof. Dr. Ali Hamood Twaij, who they give continuous advice and assistance to me and dozens of students. I also extend my thanks to all the professors for their contribution to the completion of my studies. Thanks also to my family who encouraged me to complete this study. Finally, the joy of this achievement remains incomplete due to the loss of my father and his absence from me in these moments. I was hoping for him to be by my side, but he passed away. In conclusion, I dedicate these efforts and their good to my father; may God have mercy on him.

04/ 10/ 2022

Leith Abbas Abd Alameer AL-RUBAYE

ABSTRACT

Thesis Title :Employing Mesopotamian Ornaments in Precast Designs in Iraq.

Author :Leith Abbas Abd Alameer AL-RUBAYE

Supervisor :Prof. Dr. Ersoy YILMAZ

Thesis Type :Master's Thesis

Concrete poured in the form of a structural element (such as a panel or beam) before it is placed in the final position is called precast. There are a number of companies that produce precast in modern Iraq, and these companies produce simple products with little room for ornamentation. In this research, it is aimed to reveal designs that can be an alternative to these simple designs and contain ornamental elements. In this direction, designs have been created that benefit from the visual repertoire of ancient Mesopotamia in the design of precast elements in Iraq. This is important in terms of reviving and carrying the legacy of the ancient Iraqi civilization into the present. Although previous studies used historical Iraqi shapes and symbols in their designs on various materials including carpets, pottery, and mural painting, there is a gap in the precast designs in this respect. The proposed new designs are based on five selected models: Ishtar Gate, Lamassu, Lion of Babylon, Islamic Decoration, and Shanasheel. These models were converted into precast designs using Cinema 4D and Photoshop programs. This means an artistic touch to an industrial space. If applied, panels, fences, etc. these precast elements, which will take place in daily life as structures, will have the opportunity to directly appeal to the aesthetic sensitivity of modern Iraqi society. Precast structures can also take an important place in the effort to revive and keep alive the historical and cultural values of Iraq.

Keywords: Precast design, Iraq, Mesopotamian, Ornament

ÖZET

Tez Başlığı :Irak'ta Prekast Tasarımlarda Mezopotamya Süslemelerinin Kullanımı.

Yazar :Leith Abbas Abd Alameer AL-RUBAYE

Danışman :Prof. Dr. Ersoy YILMAZ

Tez Türü :Yüksek Lisans

Son konuma yerleştirilmeden önce yapısal eleman şeklinde (panel veya kiriş gibi) dökülen betona prekast denir. Modern Irak'ta prekast uygulamaları yapan bir dizi firma vardır ve bu firmalar süsleme unsurlarına pek az yer veren yalın ürünler üretmektedir. Bu araştırmada bu yalın tasarımlara alternatif olabilecek, süsleme unsurları içeren tasarımlar ortaya koymak amaçlanmıştır. Bu doğrultuda Irak'taki prekast unsurların tasarımında kadim Mezopotamya'nın görsel dağarcığından yararlanan tasarımlar oluşturulmuştur. Bu, eski Irak uygarlığının mirasının yeniden canlandırılması ve günümüze taşınması bakımından önemlidir. Daha önceki çalışmalarda halı, çanak çömlek ve duvar resmi gibi çeşitli malzemeler üzerinde tasarımlarında tarihi Irak şekil ve sembolleri kullanılmış olsa da, prekast tasarımlarda bu konuda bir boşluk bulunmaktadır. Önerilen yeni tasarımlar, seçilen beş modele dayanmaktadır: İştâr Kapısı, Lamassu, Babil Aslanı, İslami Dekorasyon ve Shanasheel. Bu modeller, Cinema 4D ve Photoshop programları kullanılarak prekast tasarımlarına dönüştürülmüştür. Bu, endüstriyel bir alana sanatsal bir dokunuş anlamındadır. Uygulanması halinde panel, çit vb. yapılar halinde günlük hayatın tam içinde yer alacak olan bu prekast unsurlar, modern Irak toplumunun estetik duyarlılığına doğrudan seslenme imkânına sahip olacaktır. Irak'ın tarihî ve kültürel değerlerini canlandırmak ve yaşatmak çabasında prekast yapılar da önemli bir yer edinebilir.

Anahtar Kelimeler: Prekast Tasarım, Irak, Mezopotamya, Süsleme

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1. INTRODUCTION

Decorative art is one of the oldest and richest legacies in history. It extends from the periods of ancient Mesopotamia to modern Iraq. Mesopotamian arts are considered one of the most brilliant artistic elements.

This study specialized in designing precast pieces bearing “heritage” symbols derived from the civilization of Iraq and using them in making the walls of buildings. Within the scope of the current research, the focus will be on the following objectives: Investigate and explore the decoration of Mesopotamia and its advantages, which will be employed in Iraqi designs through the architectural walls of houses. Reviving the heritage of the ancient Iraqi civilization and linking it to the present time. It will also describe the different forms of Mesopotamian decoration and how to supervise the prefabricated designs, in addition to studying the technical presentation of those materials and concrete designs.

This study highlights the importance of achieving cultural, industrial and intellectual communication between the past and the present.

There are many topics are always raised about the loss of the identity of architecture in Iraq and the resulting designs that do not belong to its environment and she lacks a clear personality. This led to apparent weakness in the aesthetic aspect of that architecture, If this is addressed in a subject, time and climatic conditions will soon lose its splendor and beauty. Through previous studies we found that many researchers used historical Iraqi shapes and symbols in their designs on various materials including carpets, pottery and mural painting, all these materials have a shelf life, as well as placing them in internal places that a limited number of people can see which justifies the importance of the research.

Several questions will be discussed in the current research that can be limited to a major problem: (the deterioration and extinction of the personal identity of engineering architecture in Iraq).

The symbol should always be considered an essential metaphor for defining the local identity in Iraq. However, according to Bassim & et al. (2020). It is analyzed that the role of the symbol is considered an effective tool used in strengthening the properties of fences in architecture and urbanism.

1.1. TOPIC AND SIGNIFICANCE

This study specialized in designing precast pieces bearing “heritage” symbols derived from the civilization of Iraq and using them in making the walls of buildings by choosing selected models to study and analyse, as well as expressing their importance and relevance to the art of Mesopotamia. Many topics are always raised about the loss of the identity of architecture in Iraq and the resulting designs that do not belong to its environment and she lacks a clear personality. Through previous studies we found that many researchers used historical Iraqi shapes and symbols in their designs on various materials including carpets, pottery and mural painting, all these materials have a shelf life, as well as placing them in internal places that a limited number of people can see which justifies the importance of the research. But the current research distinguished from previous studies by achieving cultural, industrial and intellectual communication between the past and the present through the design of prefabricated pieces bearing heritage symbols derived from Iraqi civilization and used in making the walls of buildings from reinforced concrete that has the ability to withstand climatic conditions and thus achieve Its goal for the longest period of time. As well as the development of the innate sense in individuals and raise their aesthetic taste. This led to apparent weakness in the aesthetic aspect of that architecture. From here comes the importance of the topic of research, which is trying to revive the trappings of the ancient Iraqi civilization in a manner commensurate with the present time.

1.2. FOCUS AND SCOPE OF THE RESEARCH

The current research is limited to employing Mesopotamian motifs in precast designs in Iraq. As for the target area, Mesopotamian, which is a geographic-historical region located in southwest Asia. The most famous civilizations are the civilizations of Sumer, Akkad, Assyria, and Babylonia. It is considered one of the first civilization centres in the world, and it is currently located in Iraq, Syria, and Turkey between the Tigris and Euphrates rivers. Since 1980, the identity of architecture and urbanism in Iraq has significantly deteriorated and become turbulent due to the 8-year war that Iraq fought against Iran and the crises it left behind in Iraqi society, as international economic sanctions were imposed that caused a difficult living situation that negatively affected the living life of the individual. This led to Iraq being cut off from the outside world, and in 2003 Iraq was subjected to a military occupation that destroyed the country's infrastructure and exposed archaeological sites to vandalism and looting.

After that, a kind of cultural awakening followed, as the state resorted to protecting archaeological sites and emphasizing cultural and civilization identity. Where started archaeological designs stand out in graphic design and industrial design, fashion design, interior design, and architecture. This issue was not limited to the public sector in the state but extended to the private sector, where factories, companies, and production workshops were established. Concerning the subject of the research, unique factories for the precast industry were established. The designs were to start by simulating foreign designs without considering the specificity of the country's cultural identity.

1.3. THE RELEVANCE AND IMPORTANCE OF THE RESEARCH

One of the factors that prompted us to conduct this research is the deterioration and disappearance of the personal identity of engineering architecture in Iraq and the weakness of artistic and aesthetic taste in many architectural designs. Several studies

deal with traditional shapes and symbols and their use of different materials. Those details will be mentioned in the literature review section. Through previous studies, many researchers used historical symbols and shapes in their designs on various materials, including carpets, pottery, and wall painting. All of these materials have a default life, but the current research is distinguished from previous studies by achieving cultural, industrial and intellectual communication between the past and the present through the design of heritage shapes and decorations derived from the ancient Iraqi civilization on precast pieces made of reinforced concrete that can withstand climatic conditions and thus achieve its goal for the most extended period of time.

As a result, we have identified several points in which we mention the importance of this study, namely:

- This study highlights the importance of achieving cultural, industrial and intellectual communication between the past and the present.
- This method of artwork contributes and develop the innate sense of individuals and raising their aesthetic taste.
- Interest in the design of prefabricated concrete fences for buildings and their and its environs which helps to raise the aesthetic sense of the individual and affects positively on the psychological aspects of the individual and society in general.

1.4. RESEARCH OBJECTIVES AND QUESTIONS

Within the scope of the current research, the focus will be on the following objectives: Investigate and explore the decoration of Mesopotamia and its advantages, which will be employed in Iraqi designs through the architectural walls of houses. It will also describe the different forms of Mesopotamian decoration and how to supervise the prefabricated designs, in addition to studying the technical presentation of those materials and concrete designs. The following questions will be discussed in the current research:

- What are the reasons for the deterioration of the personal identity of architecture in Iraq?
- To what extent are decorative units employed in Mesopotamia in mural designs?
- How are ready-made designs in Iraq today?
- What are the aesthetic relations in the decorations of the ancient Iraqi art murals?
- How can innovations be made in these designs?
- Can we connect the Iraqi past and today through prefabricated designs?
- Why is the Mesopotamian decoration in Iraq not receiving the necessary attention and facing extinction?
- How can we find design foundations that can be relied upon in making architectural decoration to ensure its originality and continuity and to give local architecture a distinctive character?

Based on these questions, the research problem can be limited to the deterioration and disappearance of the personal identity of engineering architecture in Iraq. The research follows the descriptive analytical method to determine the importance of activating the role of historical and Islamic murals in achieving historical and aesthetic awareness of society. The study also attempts to identify the raw materials for ready-mix concrete and how to use them in mural arts. Moreover, the research attempts to show aesthetic education and artistic taste to achieve a sense of beauty in society.

1.5. METHODOLOGY

Studying the cultural, social, and industrial factors that shape the urban environment in general and the decorative art of Iraqi buildings in particular. Due to the enormousness of the substantial number of artistic productions concerned with historical murals and Shanasheel in Mesopotamia, many artistic productions were examined, both in the source books and from the global Internet. Therefore, covering the limits of the research and achieving its goal to monitor the most significant number of samples that works with the current research topic. There are five artworks chosen, these models were designed using Cinema 4D program and Photoshop program to add some frills. The research follows the descriptive analytical method to recognize the importance of activating the role of historical and Islamic murals in achieving historical and aesthetic awareness of society. Also, the study attempts to learn about the raw materials of the Precast and how to use them in the mural arts. Furthermore, the research attempts to show aesthetic education and artistic taste to achieve a sense of beauty in society.

1.6. RESEARCH LIMITATIONS

The current research is limited to employing Mesopotamian ornaments in precast designs in Iraq.

Due to the large number of artistic productions concerned with historical murals and Shanasheel in Mesopotamia, many artistic productions have been examined in books and on the Internet. The current study had strengths, the most important of which is that it specialized in designing historical decorations derived from the Iraqi civilization on precast pieces made of reinforced concrete that can withstand climatic conditions and thus achieve its goal for the most extended period. Therefore, it covers the limits and the research objective of observing the most significant number of samples working with the current research topic.

The idea in this research is a strong point, but there are still areas for improvement in this study, which is the effect of the constraints that the material cost may impose in the manufacture of molds to produce precast pieces in Iraq. Some Iraqi companies face the high prices of raw materials for fiber-class briquettes because Iraq lacks factories to produce these materials. Consequently, the precast companies are forced to import these materials from abroad, which increases the cost of mold production.

1.7. STRUCTURAL OVERVIEW

The research 6 chapters included, which specialized in designing precast pieces that bear civilized symbols derived from the ancient Iraqi civilization and their use in the precast walls. The first chapter included: the methodological framework of the research, as the research problem was presented by asking several questions, all of which were summed up in a significant problem, which is the deterioration and extinction of the personal identity of engineering architecture in Iraq.

The research's importance and purpose were presented, the temporal and spatial limits of the research, and the definition of terms, including precast, as an accurate and independent term. This chapter contributed to identifying the main problem and the importance of this study to achieve the desired goal, which is to achieve cultural, industrial, and intellectual communication between Iraq's past and present. The second chapter includes the theoretical framework and previous studies. Previous studies provided crucial academic information to serve the current study and achieve its goals. The third chapter included information about the precast history, types, benefits, and when concrete entered Iraq. The precast companies in Iraq and their production were also discussed. In this chapter, precast has been studied in detail.

Chapter four focuses on Mesopotamian decorations included its history, types, investigation, and exploration of Mesopotamian decoration and advantages, which will be employed in Iraqi designs through the architectural walls of houses. Chapter Five included information about the Iraqi Shanasheel, which was studied, and its details were known, as a specific model was chosen to design it on the precast pieces.

Concerning chapter six, it includes information about Islamic ornamentation and its types. It was studied, and its details were known, as a model was chosen to design it on precast pieces. Concerning the practical part: historical forms were chosen, such as the Ishtar Gate, the winged bull, the Babylonian lion, a model of Islamic decoration, and a model of the Iraqi Shanasheel. These models were designed using Cinema 4D program and Photoshop program to add some frills. These symbols and shapes were distinguished by the presence of composite animals representing symbols of sacred deities, including small bulls or the so-called 'akhus,' lions, and dragons 'Serush or Moshoch,' which are the symbols of the gods of ancient Iraq.

Various shapes and symbols were used in the wall works, such as animal, botanical, historical, Islamic, and Shanasheel, which gave the prefabricated fences a distinctive identity represented in any form or decoration possible according to the place and need. The work was also distinguished by the possibility of retransmission, installation, and coloring, which is a qualitative leap in the artwork industry. There is an aesthetic relationship between the employment of decoration and precast concrete parts. This method of artwork contributes to the development of the individual's innate sense and the advancement of aesthetic taste. Murals always convey people's heritage, history, and thinking because they carry a cultural message on the one hand and an aesthetic message on the other.

2. LITERATURE REVIEW

A group of articles and research deals with the issue of concrete in an engineering way, in addition to other research dealing with ready-made concrete in terms of features, benefits, and components. Also, there are studies and research dealt with the subject of decoration and heritage forms to express the country's heritage and cultural identity. This is what makes the current study a preliminary attempt to cover this important title. It can be said that it is a primitive attempt to highlight the process of harnessing the functions of design and decoration to develop projects that produce ready-mix concrete. The research states to present a theoretical study for this type of project in his thesis. It highlights the positive side of concrete construction by linking artistic decoration and ready-made concrete. As for the research that dealt with this topic from near or far, they will be mentioned as follows:

1- An article entitled '*Concrete Application as Decorative Elements in Interior Design*, (2016), by Xiaodong Zhang and published in the 3rd International Conference on Education, Management and Computing Technology' ICEMCT 2016'. This research focuses on the functions, requirements, and characteristics of building engineering and interior design in terms of space, quality, and technology. What distinguishes the current study from this is that Zhang's study deals with interior design and concrete building functions in a specific way. In comparison, the current study attempts to cover a specific area of decoration and design, link it to ready-made concrete and harness the artistic decorations to meet the user's requirements. In other words, Zhang's research deals with the architectural aspect more than the artistic and decorative aspects, which is the opposite of the current research aims.

2- An article entitled '*Practical Design and Modelling of Precast Concrete Structures*, (2019), by Morten A Herfelt, Jorgen Krabbenhoft& Kristian Krabbenhoft. This study aims to shed light on analyzing the elements and components used in the details of ready-mix concrete. These elements are reviewed and analyzed, and concrete models are proposed according to specific criteria.

It can be said that this thesis is a continuation or addition to the research of Morten and Krabbenhoft, where the thesis deals with the decorative and design aspect of ready-mix concrete. Despite the similarity of goals between the current study and the research above in terms of addressing the high costs, Morten's research depends on criteria concerned with concrete and architectural design. The research states adopting these elements to reach high quality and lower costs.

3- Many studies dealt with the issue of concrete and design. However, it studies this subject for specific projects such as building bridges, tunnels, highways, and others, as in *'Design of Precast Concrete: An Introduction to Practical Design, (1975)* by Robert A. Hartland which is the opposite of the current study, which is determined in the study of ancient decorations of Iraq and their application to reality according to specific functions, designs, and models.

4- In this study *'The importance of the association of murals with the environment and place in the design of architectural facades,(2021)* by Samia Abdullah, the research is presented the importance of the association of murals with the environment and place in the design of architectural facades, where the art of mural painting gained great significance as a type of artistic expression; It is a record that monitors the development of aspects of humanity. In the contemporary time, it is no longer a mere recording of the civilisations of peoples and embodiment of the features of its cultural identity only. Still, it has become a key player in developing and reviving visual culture and correcting vision concepts.

Wall artworks contribute to developing the innate sense of the individual and upgrading his aesthetic taste by perceiving and enjoying it and deepening the community's cultural awareness.

The ideological meanings and ideas in the murals include a symbol or several symbols bearing different meanings or ideas. The content of these ideas may be apparent or implied, and both complement the other. On this basis, figurative murals are not viewed as a form that attracts the attention of the recipient or arouses his

interest but instead look at their composition and the ideas and meanings it carries, and the features or intellectual dimensions it embodies within the framework of the purpose that the artist seeks to achieve; The modern designs of contemporary murals reflect human qualities, values, issues, social and political problems, and religious systems and teachings in society, as well as customs, norms, traditions and ideas, including what contributes to preserving the history of community and its coherence and the growth of artistic taste among its members, including what is related to the culture of the recipient who contemplates those murals that express the freedom of expression of ideas, the freedom to choose formal vocabulary about the environment and society, and what it does in documenting society's thoughts and criticising its issues and problems.

The fences of buildings and architectural facilities also play a significant role in clarifying the concepts of design and formation and showing the compatibility of the designer and the recipient or their contradiction. The fences also bear the influences of time, place, cultures, available technologies and other matters. The Philadelphia and Baltimore Program played an important role in beautifying the fences of buildings, architectural facilities, and others.

Paying attention to the beautification of architectural fences and their environmental surroundings helps raise the aesthetic sense of individuals and positively affects the psychological and physiological aspects of individuals and society as a whole.

What distinguishes the current study of Samia Abdullah's that she deals with the mural painting art, which is done by using paints and brushes. This type of work has a "virtual" life and is not intolerant to climate factors.

5-Nidal Abdul Majeed.et al. (2010). The study is *Employing a vocabulary from the Akkadian civilization in mechanical carpet design*, This study came as a continuous step with the steps that preceded it to emphasis the main objective, especially the achievement of the Iraqi industrial and intellectual civilization communication between the old and the new. The current study specialized in designing a carpet

bearing cultural symbols derived from the Akkadian civilization and its use in creating mechanical rugs.

In this study, several cultural symbols were drawn from the Akkadian civilization to prepare a design for an Akkadian rug that bears national peculiarity and clearly emphasizes the presence of the cultural heritage in the design, especially in the creation of carpets.

This study consisted of symbols. The first was the symbol of the sparkling water vessels, which is the symbol of goodness, giving and development in the ancient Iraqi thought, as this symbol has been significant since the civilization of the era, the dawn of dynasties through the Akkadian period and in continuity with the ages that followed them in the era of the third dynasty of Ur, the Babylonian, and the Assyrian eras. The second symbol is the star symbol, the symbol of the god Shamash, known in its shape and style of drawing, as the Akkadians used it as a banner that distinguishes them in battles. Also used star symbol in the design of the logo of the Iraqi Republic in 1958. One of the most important recommendations of the researchers on the study is to continue to elicit symbols of human civilization in the Iraqi carpet industry.

Through previous studies, the study found that many researchers used historical Iraqi shapes and symbols in their designs on different materials, including carpets, pottery and mural painting. All these materials have a default life, but the current research distinguished from the previous studies by achieving cultural, industrial and intellectual communication between the past and present throughout designing those shapes and decorations on precast pieces made of reinforced concrete bearing heritage symbols derived from the Iraqi civilization, which has a longer life and can withstand climatic conditions and thus achieve its goal for the longest period of time.

Finally, regarding the current research, it is an attempt to revive heritage by using art and design in public places. How these designs and decorative arts are used in the form of heritage sculptures appear in public and in front of everyone's eyes. It gives a

noticeable difference from these previous studies, where a relationship is not only an explanation but a theory and practical at the same time. The ancient civilization of Iraq is highlighted by exploiting the walls of houses and external buildings and implementing these civilization designs on them, which allows to revive it again and link it to the present in that way.



3. PRECAST CONCRETE DESIGN

It is a structural product that is produced in molds or shapes that are subject to renewable formation. These concrete molds are formed according to the construction requirements and the conditions signed between the user and the construction company. After the concrete is poured into the formwork, it is transported to the construction sites. It is then processed under appropriate environmental control, which is closely monitored by plant staff. Examples include beams, walls, panels, and roofs (Allen, 2009).

Lightweight polystyrene foam is used in forming these concrete models, as this material is considered a core for prefabricated wall panels; this process aims to reduce weight and increase thermal insulation. The color can also be used in the concrete mix, in addition to some components that affect the proportion, size, and texture. Forms used in Precast concrete can be reused hundreds of thousands of times before replacement. Precast concrete is used in various indoor and outdoor fields, such as bridges, tall buildings, highways, and pitched buildings. Precast concrete is also used at ground level, increasing its formation and control safety.

Concrete forming systems differ according to size, function, and cost; concrete types can cover all or part of the facade of buildings, and other types are used in setting up walls, forming gardens, and sound insulation. Some types are used in security. Precast concrete is also used in roofs of structures, parking lots, water and sewage pipes, and tunnels. All of those uses differ in their formation in terms of size, function, and cost. Precast concrete molds can be made from wood, rubber, steel, fiberglass, plastic, or other industrial materials, and each has its unique feature (The Eco, 2022).

Precast concrete is produced by pouring concrete into a reusable mold or form that is cured in a controlled environment, then transported to the construction site and lifted into place. Precast concrete is also used inside external and internal walls. By producing precast concrete in a controlled environment ‘commonly referred to as a

precast concrete plant, the ready-mix concrete is given the opportunity to cure properly and is closely monitored by the plant personnel. There are different types of precast concrete buildings, which can be categorized as precast, partial and precast concrete structures. A study performed by FIB Commission in 2014, introduced the best practice opportunities that would enable architects, design engineers and contractors to work together towards finding efficient solutions, which is considered to be unique to precast concrete buildings.

Additionally, the study focused on explaining the basic design principles and systems that could be directly used too maintain stability of precast structures. The study also highlighted that Precast concrete structures should be designed according to a specific stability concept, unlike cast in-situ structures.

It is necessary to study each system in order to better understand and reach the appropriate application. Therefore that the total prefabricated building consists of precast components such as roofs, beams, panels, columns, walls, facades, etc. This type of building is also known as hybrid construction. Mixed construction buildings consist of precast, steel, masonry or wood components. As for the research sample, it is a precast fence. This technique can be seen in the Babylon walls laboratory (See figures 1 and 2).



Figure 1. *Examples of production of aswar babel factory*



Figure 2. *Example of production of precast in Iraq.*

3.1. HISTORY OF PRECAST CONCRETE

The ancient Romans were considered the first to use concrete. They poured the material into molds to build sewage channels and tunnels and used it in architectural construction and individual structures. In the modern era, specifically in England in 1905, precast concrete was used to clad buildings with prefabricated panels. British engineer John Alexander invented this process in construction and then expanded it to use in the tram stables in Liverpool. Subsequently, this method was adopted worldwide, especially in eastern and central Europe. In the nineteenth century, concrete was used only in the construction of commercial buildings. Concrete was not accepted by society at the time for aesthetic reasons.

Concrete began to enter the construction of homes in 1850-1880, and the servants' house built by British William Wilkinson in 1854 was the first house made of reinforced concrete in the world. In 1875, mechanical engineer William Ward built the first reinforced concrete house in America, and to make it socially acceptable; he built it similar to stone masonry. In Australia, railways were built in 1917 and 1932

with precast concrete, with stations and similar buildings being constructed and 145 buildings of the same type (Precast concrete, 2006).

In the late nineteenth century, rebar development began. It is seen that the credit for rebar development is due to one individual; many people contributed to its development, including German engineer Gustav Weiß, French François Hanbeck, and American Ernest Leslie Ransome. After that, concrete swept the construction world and recorded its remarkable presence in the late nineteenth century. Talking about the entry of concrete into the world of construction as a whole would take many pages, but what matters in this context is that from 1900 to the present day, the construction sector has witnessed a significant development; following the discovery of reinforced concrete, in addition to entering the design process in its formation (Wang & et al., 2017, pp. 138- 147).

3.2. FORMATION AND COMPONENTS

Steel is used to reinforce precast concrete and improve strength and durability. Single concrete has good compressive strength, but at the same time, it lacks tensile and cutting strength. It can also crack when loaded for long periods, which is why steel is used to compensate for weak points in concrete. Iron is also used in concrete reinforcement, one of the most common uses in procuring precast concrete. Iron is manufactured and shaped according to concrete sizes and requirements, where ribbing is used to bond the iron to the concrete during curing. Iron is used to form the concrete structure and bend it according to the requirements without any difficulties, making it an essential material in the precast concrete process. Carbon steel is also one of the most widely used iron materials (Precast concrete, 2006). Concrete is a building material obtained by mixing water in specific proportions with cement, fine aggregates such as sand, and coarse aggregates such as gravel, crushed stone, and boulders. When mixed or appropriately mixed, cement and water start a reaction to bind the ingredients. Then it produces a ductile mass that hardens over time. This ductile and hard mass is known as concrete.

Technological developments have led to the invention of new types of concrete with specific uses, the most important of which will be mentioned in the following paragraphs. The properties of concrete depend on the quantity and proportions of the components used in the mixture. However, the properties can also be significantly modified based on the types of cement used in the mixture. Concrete is solid in compressive strength but poor in tensile strength. Fresh concrete can be poured into suitable shapes or molds to obtain the desired shape and size.

Precast concrete is created off-site using a formwork. This is the main difference between precast concrete and cast-in-situ concrete, which is poured at its final destination on site. Here is a simplified overview of the precast concrete process: precast concrete is poured into a wooden or steel mold with wire mesh or steel reinforcement. This template may also contain a pre-zip cable, if needed. It is treated in a controlled environment. Once completed, the precast concrete is transported to the construction site and set in place.

Precast concrete elements should be designed and constructed in compliance with the Building 'Construction' Regulations and other relevant codes of practice. The design method specified in this code of practice for the design of precast concrete elements is the limit state design method. Alternative design approaches may be used provided that sufficient justifications are given. Unless otherwise specified, the design considerations and detailing requirements recommended in the code of practice for structural use of concrete should be followed.

Moreover, precast concrete elements should be designed and constructed in compliance with the building construction regulations, this while taking in coto consideration the other relevant codes of practice. Accordingly, the design considerations and detailing requirements recommended in the code of practice for structural use of concrete should be followed diring the making of precast desgins unless otherwise specified (The Buildings Department, 2016).

During the past few years, precast construction has gained much importance. Additionally, several studies reported on precast beam-column joints has emphasized on the selection of the appropriate connections to be adopted particularly for regions of low to moderate seismicity. According to Raju & et al. (2013), the seismic performance of precast concrete structure very much depends on the ductility of the joints framed by precast beams and columns, these methods also seem to be the most widely used in the precast construction in seismic regions.

Furthermore, precast concrete structures are conventionally designed using manual methods and simplified numerical tools, the quality of the design significantly relies on the skill and engineering intuition of the structural engineer. However, it was concluded that the use of finite element limit analysis would greatly optimise precast structures, therefore, making precast structures more sustainable as well as cheaper (Krabbenhoft, 2019).

Another book by Steinle (2011), reflected the present situation in precast concrete construction. It mainly focused on the boundary conditions for the design of precast concrete structures, loadbearing elements and facades. In addition, it was said that the stability of precast concrete structures is considered to be central theme of precast structure, and thus would lead to the ongoing development of precast concrete construction.

3.3. TYPES OF PRECAST CONCRETE

There are several types of concrete; the most important and most common will be briefly explained as follows (Muslim, 2017):

1- Ordinary Cement Concrete PCC: An essential concrete mix consisting of cement, fine aggregate, coarse aggregate, additives optional, and water. PCC is powerful in compression but is fragile in tensile because there is no reinforcement like steel. The overall mixture design ratio for PCC is 1:2:4 and 1:3:6. Commonly used in building foundations and hygiene molds. After reaching the solid soil layers, a sand layer is

placed, followed by ordinary cement concrete. On top of ordinary cement concrete, a reinforcing cage is placed for the base.

2- Reinforced Cement Concrete RCC: It is a composite material consisting of cement, fine aggregate, coarse aggregate, additives, and steel reinforcement. It is simply ordinary cement concrete with steel in it.

All limitations in ordinary cement concrete can be overcome with reinforced concrete. Of all the metals, steel is the most suitable reinforcing material due to approximately the same coefficient of thermal expansion. Because of this property of steel, it is more compatible with concrete than other metals.

3- Fiber Reinforced Concrete FRC: It is a composite material consisting of cement, water, aggregate, and flat or round fibers. Fibers such as steel, polypropylene, glass, asbestos, carbon, and organic fibers are widely used to reduce permeability, bleed, crack, and increase durability. Fiber is added at 0.1% to 3% of the total volume of concrete. The dimensions of the fibers are represented using the term "aspect ratio," which is the length ratio to the fibers' diameter. The fiber aspect ratio generally ranges from 30 to 150. The direction of the fibers is primarily random but can be arranged parallel or vertical depending on design parameters.

4- Glass Fiber Reinforced Concrete GFRC: It is a composite material consisting of cement, water, aggregate, and fiberglass. Fiberglass has a high tensile strength of approximately 4,080 N/mm². Fiberglass also increases the structure's durability due to its alkaline nature. Glass fiber is one of the cheapest fibers and components, making the structure more economical.

5- Ferro cement / Ferro concrete: It is a reinforced concrete structure composed of cement, fine aggregate, wire mesh, and water. First, a tightly packed wire mesh is installed, through which a rich mixture of cement mortar in 1:2 or 1:3 ratios is applied on both sides of the wire mesh. The diameter of the wire in the wire mesh is limited to 1 mm to 1.5 mm, and the distance between the holes is not more than 20

mm m/m. The mortar application to the wire mesh can be centrifugal, mechanical, or spraying.

6- Ready-mix concrete: A concrete made in the factory from cement, aggregate, water, and some additives and then transported to the site. This type is considered the most common and used in Iraq. Factory-made concrete is loaded into special delivery trucks called conveyor mixers, which can continuously rotate the concrete and keep it in motion, thus preventing solidification. It is preferable to use ready-made concrete when there is less space for storing and mixing building materials. Usually, retarders are added to the concrete mix to slow down the setting process and give additional time to convey and pour the concrete. Quality inspection is carried out both in the factory and on-site. The difference in the slack value shall not be more than 25 mm or 1/8 of the specified value, whichever is greater.

7- Precast concrete: Structures are cast, cured, transported to the site, and erected or erected using cranes. Precast structures are manufactured on-site using molds with reinforcing cages inside. Hardened concrete members are cured under controlled conditions to achieve optimum strength. Special hooks are also provided in the cast sections to facilitate transportation and lifting. Transport, handling, and installation stresses are considered when designing prefabricated sections that may arise during construction. The design and decoration are usually included in its formation so that this type can be observed in abundance in Iraq. It can be noted that this type is widely used in unique fences in Iraqi government departments, especially security ones.

8- pre-stressed concrete: consists of high-strength concrete and high-strength steel tendons or cables in addition to regular reinforcement. When the tendons' cables are pre-stressed, the stress is transferred from the cable to the concrete, thus improving deflection resistance, bearing capacity, and the overall structural performance of the strip. Pre-stressed concrete structures are commonly used in the construction of prefab buildings.

Finally, there are many other types of concrete such as polymer concrete, high-density concrete, lightweight concrete, high-performance concrete, high strength and resistance concrete, air caged concrete, extruded, and dry concrete, pressed concrete, smart concrete, lime concrete, bacterial concrete, printed concrete, cement concrete (Muslim, 2017).

3.4. BENEFITS OF PRECAST CONCRETE FOR CONCRETE CONSTRUCTION

Precast concrete has many advantages over conventional insitucast concrete. It is cast and cured in a controlled environment, and thus allowing the increase of quality control level and, therefore, makes it possible to decrease many tolerances. The precasting enables parallel production, which would considerably rise the speed and level of efficiency (Krabbenhoft, 2019).

Thus, it is a highly efficient and practical method of concrete construction that makes beautiful buildings possible at a cost that rivals even the most utilitarian industrial buildings. Understanding some of the benefits of precast concrete will help designers assess the impact of precast concrete on the environment and the construction process. Here are some of the benefits of precast concrete for concrete construction:

- 1- Provides an effective delivery model for your project by allowing the building to proceed with construction while the design is being developed.
- 2- It can take almost any shape or size. It is also manufactured in almost any color and comes in a variety of finishes. With precast concrete, you are only limited by your imagination.
- 3- Precast concrete products are manufactured outside the site , and under the roof then delivered ready for installation when needed. This innovative process compresses project schedules, reduces safety concerns, and reduces site disruption. Moreover it lowers overall project costs by requiring fewer deals to build and fewer people on site.

- 4- Precast concrete structures provide superior resistance to fire, natural disasters, insects and mold. Like any other building material, its resistance to rain, wind damage, earthquakes, termites and rot provides lower maintenance and insurance costs. It can also withstand many winters of freeze-thaw cycles better than other building materials.
- 5- The costs associated with heating and cooling can be significantly reduced through the benefits of thermal mass of concrete. Low peak cooling and heating loads can be achieved because concrete reacts slowly to changes in the outside temperature.
- 6- The external structure of precast concrete can be left unpainted without damage from the elements. If painting is required, repainting is only required every five to ten years. Precast concrete interior spaces are also less susceptible to damage and easier to wash.
- 7- Due to the density of concrete, prefab buildings absorb sound, making them an ideal choice for commercial and residential buildings.

A recent book published in 2017, introduced the conceptual design ideas for the prefabrication of concrete structures, and also focused on the importance of a detailed structural analysis of precast concrete should be performed prior to structural applications. The study also established some foundations about the European Product Standards for precast designs that reinforced and prestressed concrete elements, composite construction, joints and connections and frame stability, which all together would ensure the stability and productivity of a precast concrete structure(Elliott, 2017). This book is specifically important as the author explains his design approach in a very comprehensive way that allows young *and* experienced engineers to understand the followed design philosophy and the relevant clauses in the most common codes. The many worked examples provided in the book seems to fill the gap between theoretical approach and daily practice.

3.5. THE INTRODUCTION OF MODERN ARCHITECTURE AND PRECAST DESIGNS TO IRAQ

Since prehistoric times the styles and methods of construction and architectural conceptions have changed. However, all the methods for using local natural materials for construction are maintained. It helped preserve the unique identity of the buildings and ornamental figures.

In 1917, Iraq became under British rule, and during this period, the buildings and architectural figures started to resemble the European style. New materials were used for the first time, like cement and iron; however, the usage of new materials and foreign designs demolished the Iraqi heritage and its cultural identity. On the other hand, this era is known for being a point of change in historical Iraqi ornaments and architecture.

Additionally, the new housing styles did not consider the Iraqi environment and history. Therefore, the techniques of building arches were completely changed. These changes in the style of building and materials are still in use in the present time.

Moreover, the natural materials and local products such as bricks were now reused in a new technique known as stone technology and were mainly employed on the outer side of the walls. Besides that, modern and structured urban plans were applied, and towns were built like the modern British styles of architecture.

At the same time, the Iraqis pursued to take advantage of modern technology and new materials in their work. Therefore, modern buildings are characterized by presentations that are not related to the country's civilization. The style of buildings, the use of historical and cultural Iraqi ornaments, and architectural arts were forgotten, as well as the Mesopotamian flavor, ornaments, and architectural styles. Subsequently, the buildings turned into concrete masses with foreign shapes and no character related to the authentic civilization heritage (Al-Taie & et al., 2012).

Nonetheless, it was argued that the modernization movement that occurred in Iraq during the '50s, it was concluded that the past and present architectures in Baghdad had nothing in common; instead, it seems that the designers probably neglected the architecture styles in the previous era during that period. Therefore, several architectural projects did not belong to one overall style.

As mentioned above, the historical background of Iraqi architecture, art, and styles is magnificent and essential. It was necessary for us to examine the different historical ornaments and their representations throughout history to point out the reason for writing this research. As explained, the main focus of the research is to introduce the importance of employing Mesopotamian ornaments in precast designs. The importance of employing Mesopotamian ornaments in precast designs in Iraq originates from the significance of those historical and artistic designs. Furthermore, this was derived from the cultural and historical means that state Iraq's identity and that history should be maintained rather than buried. Furthermore, by using and employing them, it is easier to know the identity of the decorative ornaments of the country.

The study seeks to develop the artistic taste of the recipient, especially modern generations, and introduce them to the types and decorative methods they inherited from their ancestors, besides taking advantage of modern materials, according to their availability and compatibility with different places. During the past few decades, Iraq seemed to lack the use of its decorative legacy with contemporary and modern precast designs, which will gradually lead to the extinction of these ornaments. After thorough research on the past and present features of ornaments and their importance, the need to introduce the idea of employing Mesopotamian ornaments in precast designs was understood, using pre-existing and ancient ornaments designs. In turn, it will help restore the cultural and historical style of the cities of Iraq and allow employing historical figures and designs that were once part of the Iraqi identity.

Iron-reinforced ready-mix concrete is one of the most common types in Iraq. However, after the period of the siege imposed on Iraq in the eighties of the twentieth century, it ultimately relied on engineering cadres and the Iraqi workforce in the manufacture of concrete. Many government buildings, towers, bridges, and hospitals have been built. Now, there are dozens of domestic companies that produce this type. After the field visits carried out, it was found that a group of Iraqi companies was working in the field of precast. But we found that the designs of these companies lacked the presence of historical forms and symbols that express the cultural identity of Iraq, they were simple designs and some of them contain Logo for some companies and government departments. The most important of these companies are the fortified country in Babylon, the Kavin Group in northern Iraq, the Al-Fayhaa Company for Prefabricated Building Industry Ltd, and the Aswar babel factory in Babylon Governorate and AL-Burhan Group and Al- Tahseen Co.

These companies have implemented many projects in the governorates of Iraq, as they produce many concrete products such as prefabricated floors, concrete pieces for bridges, ceilings of hollow buildings, concrete pillars and barriers, and production of kiosks, umbrellas, seating, and guard towers. It also produces concrete fences with supporting columns, but they are of simple designs that lack artistic and aesthetic sense. These designs do not belong to the Iraqi identity, and their cost is high due to the sizes and dimensions of the molds they use, which increases the weight of the piece. As a result, these companies are forced to resort to giant mechanisms to lift and install these parts from their places, which increases their cost (See figure 3, a, b, c, d).



Figure 3. *Examples of production of precast companies in Iraq.*

Finally, it can be said that the idea of making citizens accept this type of construction relies on the extended future guarantee. It also explains the various benefits that the customer gets, such as the possibility of replacing damaged parts easily, quickly, and permanently, changing the color, moving parts from one place to another, and the ability to protect against environmental conditions, earthquakes, and floods due to solid materials, safer under challenging conditions, and this would reduce losses. Also, the life of the building in the traditional way 'bricks' ends after 30 to 50 years, while concrete can give companies a guarantee of more than 100 years. There is also a proposal that helps spread and adopt construction operations through ready-made concrete, which is the exploitation of designs and modern art in the formation of ready-made concrete, which increases the ability of people to rely on it (Qora&Yaqoub, 1996, p. 22).

There is also a civilized feature: this type of construction preserves the environment. There will be no building residues or dust in the roads, gardens, and residential buildings, where a considerable part of this pollution is overcome. The design can be used to form ready-made concrete in attractive and heritage shapes, which is the subject of the research.

4. THE ORNAMENTATION IN IRAQ ‘MESOPOTAMIA’

Iraq has played a significant role in establishing the first civilizations in history, which reflected evidence of prehistoric developments. Consequently, the unceasing developments in architecture, art, and human life increased spontaneously, and as a result, religious temples were built along with houses, markets, and other accommodations, especially during the Mesopotamian period. The ancient Iraqis became famous for their Mesopotamian art, ornamentation, and sculpture, in addition to the religious and civilian architectural buildings. This proceeded until they reached the top of artistic prosperity and development during the Islamic era, the Arabic ages, and the Ottoman age.

The ornaments in Iraq are recognized as one of the oldest ornaments in history, and that is because the first human civilizations are traced back to being established in Babylon, and during that time, it was known as ancient Iraqi art. They are considered the ancient arts of the BC era, which widely spread in Mesopotamia and were represented by ornaments, inscriptions, ornaments, drawings, ornaments, costumes, sculptures, and various other types of arts that the artists of that civilization used to express that time and carry its culture and aesthetics (Al-Qaher, 1987).

The study (Baqir, 1986, p. 322) verified that ornaments have appeared in Iraq since the beginning of antiquity, and the use of those ornaments was every day in buildings and palaces, as well as temple walls. They were used as a method of eliminating the unified layout of the walls, and it is used to give an aesthetic element to artistic works.

Furthermore, a meditation on these ornaments reflects the extent of the ingenuity of the Iraqi artist and that these beautiful ornaments were not the result of chance but rather the result of accumulated experiences. The study by (Abdel Salam, 2021, pp. 225-248) concluded that it is possible to identify the comparisons between the ornaments of ancient Iraqi art and the Assyrian motifs in the artwork and how the artists were able to express their desires clearly and skillfully.

Accordingly, this gives the research the basis of historical foundations over the usage of ornamentation in ancient Iraq, which supports the literature of the research, and allows us to establish a closer view on the importance of the employment of ornamentations in Iraq.

Ornaments are considered one of the primary forms of communication that the world has witnessed. Ornaments always convey people's legacy, history, and thinking because they carry a cultural message on the one hand and an aesthetic message on the other (Baqir, 1986, p. 323).

The ornaments, as far as the ancient artists were aware, are documentation of what he goes through in his daily life, as it embodies everything that he is exposed to on the walls of caves, palaces, and temples in a variety of subjects. As a result, there are many drawings on those walls (Abdel Salam, 2021, pp. 225-248).

From the study of the first forms of ornaments in the first stone age, which are the ornaments of caves, the ornaments of caves have a dialectical relationship with man, confirming the extent of the link between him and the environment and the time in which he lives, documenting his activities and creations, describing them economically, ideologically and socially (Gavlikowska, 1995).

The ancient Iraqi artist used everything around him as artistic forms for purposes and connotations to understand the world around him and tame it for his benefit. The ornament art and its features made it one of the most prominent arts to tell the world about the glories and greatness of the civilization of Mesopotamia (Abdel Salam, 2021, pp. 225-248).

The most beautiful and greatest works were formed in that era, and it is still supercilious today. The art of plastic ornaments emerged under the Sumerians and Akkadians, and this art reached its peak in the days of the Babylonians and Assyrians. Most of the ornaments discussed in this research are gods and kings. Their formation played a crucial role in understanding the fine works. The ancient Iraqi

plastic art is a message that contains many symbols and secrets as it was an essential intellectual communication between individuals through generations. Throughout their transformations and development, the plastic ornaments conducted all the intellectual, social, and ideological concepts. Plastic art is one of the basics of inference on other civilizations. The tangible evidence expresses every era in its people, nation, arts, cultures, traditions, and even religions (Gavlikowska, 1995). The ornaments in Mesopotamia are various and are a primary source of understanding of this civilization. The ornaments in ancient Iraq are divided into two forms of art: ornament paintings and sculptures.

Drawings had a diverse and vital presence in ancient times. An example is what is found on the walls of the Warka Temple of drawings of geometric shapes on the pillars of the temple, which cover the walls in various colors, most of which are like mosaics. The mural drawings were changing, like the rest of the arts, in their character, and this gives the idea that their function does not end, and the developments that occur in the mural drawings are parallel to the transformations in thought, doctrine, and approaches to power and the state in that era. Although the drawings in the ancient Babylonian era differed in the formative, formal, and objective formulations, they were based on a fixed premise and the same religious contents. Not to mention that the ornament paintings do not last as long as the mural's carvings due to the natural conditions over the years, which removes the colors or the drawings (Abdel Salam, 2021, pp. 225-248).

Another ornament is called 'ornament's engraved, or 'mural's carvings. When man knew stability in ancient Iraq, he started with ornament engraved and engraved all his desires to extract them with designs according to what he saw or by revealing the secrets of nature. The art of ornaments engraved reflects the reality of the environment and the natural and social environment. It is the mirror of the personality. It was noticed that all of this in the ornament engraved on palaces, temples, and centers of power, especially in the civilizations of Mesopotamia, which adorn its walls from the inside and outside, and the majority of the murals

represented kings or symbols of the god forces of fertility and reproduction (Les, 1982).

The ancient man thought was closely related to nature and its multiple phenomena, which significantly impacted intellectual production. The most critical link for the ancient Iraqi artist was with the religious aspect, especially in the religious settlements that care about the rain. The ornaments had a distinguished position in the Mesopotamian civilization and were one of the means of human expression of religious beliefs and ideas. To understand the reality of these ornaments, the development of sculpture from the earliest to the end of the modern Babylonian Empire and all the changes that occurred in those stages must be followed (Al-Zarq, 2017).

Babylonian art was at the top of the ancient plastic arts in terms of the quality it reached, as shown by the murals on the Ishtar Gate of a group of dragons, lions, and bulls. In the modern Babylonian era, glazed murals appeared for the decorations and drawings of Babylonian halls (Abdel Salam, 2021, pp. 225-248), such as the throne hall and on the outer wall of the Ishtar Gate of glazed lions, where there were two types of flat and protruding images, which are considered an intermediate state between painting and budding sculpture. The ornaments engraved are available in a considerable number, and the reason for this is due to their high resistance to difficult climatic and natural conditions and throughout the ages attributed to the ornament's drawings (Abdel Salam, 2021, pp. 225-248).

The architecture of Mesopotamia 'Iraq now' encompassed several distinct cultures and spanned the period from the 10th millennium BC to the 6th century BC. As previously described, among the many Mesopotamian architectural accomplishments are the development of urban planning, the courtyard house, and the ziggurats. Despite that, architecture as a profession did not exist in Mesopotamia.

Additionally, the early establishments of monumental architecture in Mesopotamia are usually considered to have occurred within the same period as the founding of the

Sumerian cities and the invention of writing, about 3100 BC; in addition to that, the attempts at architectural design during the same time frame was specifically recognizable in the construction of religious buildings.

Furthermore, it has been considered that the rarity of stones in Mesopotamia contributed to the primary stylistic distinction between the Sumerian and Egyptian sculptures. The Mesopotamian stones were imported from remote sources, often in the form of miscellaneous boulders. Egyptians extracted their stone in prismatic blocks, which served as the main point of the uniqueness of Mesopotamian art.

One of the artistic topics is the Assyrian and Babylonian ornament, which covered many aspects of political, social, and military life and its connection to architectural art, which is called architectural sculpture. The walls of Assyrian palaces were lined with sculptured and colored slabs of stone instead of being painted. The Assyrian carvings were distinguished by their multiplicity of locations, including large carvings such as winged bulls 'Lamassu', which symbolize strength, wisdom, courage, transcendence, and realism.

Under architectural and decorative arts, most motifs and designs used in ornaments are derived from geometrical shapes and patterns or plants and human and animal figures. Across the history of civilizations, there has been a rich tradition of using ornaments as an essential part of a specific culture.

Undoubtedly, each country has its own architectural heritage with a specific ornamental character. However, Iraqi decorative arts mirror the thought of the Arab civilization and the philosophy of that artist who created the best image and figures to include various aspects of architecture. Moreover, Iraqi ornaments were characterized by a style of decorative diversity, richness, and simplicity simultaneously. The most important of these ornaments will be briefly addressed as follows:

A. Ornament of the Gods: There are enough Assyrian murals to show a complete picture of that civilization. Their artistic tendency was towards glorifying their fierce warrior gods and kings. Therefore they showed their gods and kings in pictures, and sometimes they were shown in backgrounds. The Assyrian murals of Mesopotamia suggest that it is a ceremonial memorial, that is, the official celebration of significant events and the presentation of the ideals to which the people relate, compared to the artists of contemporary art who express the same artist and what is inside (Abdel Salam, 2021, pp. 225-248).

The nature of war in which the Assyrians grew up lived on their beliefs and rituals of worship, their gods are warlike, and this is embodied in their chief deity, 'Assyria,' the god of war, where he is embodied in the drawing of a warrior with challenging features carrying complete and ready war equipment.

In the second place comes the status of the goddess 'Ishtar, the wife of 'Assyria, where she is painted according to the military attribute, carrying a sword and a bow and putting on her shoulder arrows prepared for combat, even though she is represented as a lady. The worship of the Assyrians did not depend on these two gods but rather went beyond that to many of the gods with which they came into contact in Mesopotamia itself through their contact with the different peoples and cultures that passed through the region, including the Aramaic, which prompted them to take the gods of those peoples as their gods by that friction. This technique can be seen in the 'Ashur,' the god of war (See figures 4 and 5).



Figure 4. *Ashur 'the god of war, as he is embodied in a drawing of a fierce warrior carrying full and ready war equipment'. (Abdel Salam, 2021, pp. 225-248).*



Figure 5. *The goddess 'Ishtar', wife of 'Ashur', as she is depicted according to the military attribute. (Okasha, 1994).*

The sculpture in the Assyrian civilization in its different eras, which lasted more than 500 years, embodies various activities related to the gods and rituals of worship, the movement of society, the details of the lives of kings, and court topics. For example, hunting scenes and military victories resulting from the many wars and invasions that they were carrying out added a kind of strength and cruelty to the sculptural forms; on the one hand and the other hand, it was full of feelings through the scenes of hunting lions and their movements, and the scene of the wounded lioness states a lot of artistic and aesthetic meanings.

These include, for example: 'Shamash,' was the ancient Mesopotamian sun god (See figure 6), 'Sin' which is the God of the moon (See figure 7), and 'Nabu' was considered the God of the wisdom and writing (See figure 8), 'Baal' which means the master (See figure 9), 'Marduk' was the chief deity of the ancient Babylonians, and was essentially a god of the city of Babylon, and 'Ninurta,' who is considered the lord of barley and the God of law, writing, agriculture, and hunting (See figure 10).

The Assyrian civilization was found in Northern Mesopotamia, formed by hills and mountains providing stones as raw material. Buildings were constructed, and giant statues were made of various stones, especially at the Assyrian kings' entrances to cities and palaces. It is known that the raw material in which the statues were made for each period of the Mesopotamian civilization reflects the shape of the environment in which they were found and its susceptibility to climate influences.

Information about animals in Mesopotamia comes from three sources, the first of which is the excavated bones, the second is the textual references, and the third is the artistic scenes. Many animals, including domesticated and wild, were illustrated, and displayed on the scenes of monuments and Assyrian cylinder seals. These animals included elephants, birds, and fish. However, the most common animals shown were those that gained importance in the civilization of Mesopotamia, such as lions and bulls. Of course, the depiction of wild animal scenes in artworks dates to more ancient times than that era, as evidenced by the excavations. However, the study will

be limited to what is related to the topic of research specifically, as various forms of wild animals such as lions, bulls, and horses. have been implemented in those works according to explicit rules and foundations in the design of artistic scenes, which calls for knowing the artistic features and method of implementation. This technique can be seen in the 'Hammurabi' with the Sun god 'Shamash'.



Figure 6. *Hammurabi receiving laws from the sun god 'Shamash'.* (Sahib, 2011).



Figure 7. *'Sin' the God of the moon.* (Okasha, 1994).

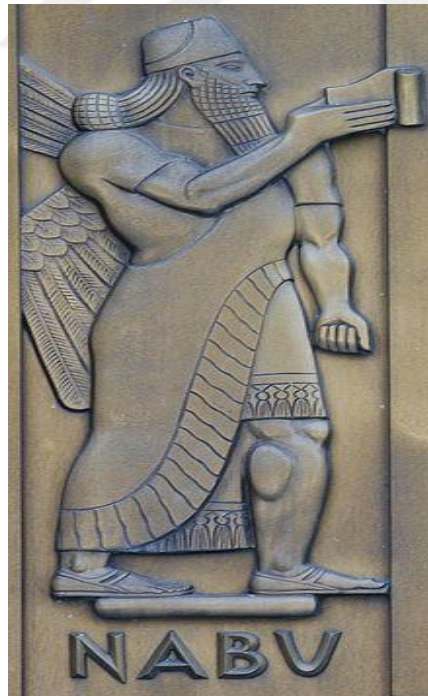


Figure 8. *'Nabu' the God of air.* (Sahib, 2011).



Figure 9. *'Baal' which means the master.* (Abdel Salam, 2021, pp. 225-248).



Figur 10. *Marduk, was the chief deity of the ancient Babylonians, and was essentially a god of the city of Babylon, and 'Ninurta.'* (Les, 1982).

Furthermore, inference on the motives behind the prevalence of these artistic scenes at the time, most of these artistic scenes are represented by wall sculptures as it was implemented on their surfaces to decorate them and reflect the prevailing environment and the types of wild animals contained. Not to mention the role of these animals in civilization and its multiple aspects, as well as eliminating monotony and emptiness on the surfaces of those models concerned. These works express a critical civilization stage that clearly impacted the later arts. In terms of implementation technique and continuous experience, the following is a presentation of selected models from those artistic scenes:

- ***The Lion:*** Lions are considered one of the wild animals that were abundant in ancient Iraq, especially in the middle and north (Ayad, 2008). The lion was considered one of the animals that had the most important and preferred influence in the beliefs of the population, so the animal was taken as a symbol of their deities, such as 'Ishtar,' which is the god of love and beauty, 'Adad' the god of storms and rain, and Nergal which is a warrior rooster, as in the legends (Frankfort, 1958). As is well known, the lion symbolizes strength and courage for most ancient peoples, including the ancient Iraqis, so the kings took it as a symbol of ownership. The forms of lions were executed in the scenes of the Assyrian sculpture a lot. The Assyrian artists immortalized the lion and its hunting at that time in their drawings and sculptures, and these models are considered masterpieces of international Art (Frankfort, 1958). The lions received a clear interest among the Assyrian kings for their importance in the religious aspect - lion hunting campaigns were an expressive aspect of religious orders that were no less important than the orders to carry out military campaigns according to their concept (Ayad, 2008).

The most beautiful scenes found are those wall carvings that represent the scenes of hunting the Assyrian lions, and they are very accurate and artistic and express the genius of the Assyrian artist and his clear experience in carving those scenes with their tiny details. The most crucial scene of these and in this context some scenes of lionesses. The scenes of the lioness are many in the wall carvings on the Assyrian

palaces. That scene depicts the figure of a dying lioness whose body was pierced by three arrows, while it still retains sufficient strength to lift itself on its front legs, while its hind ends appear parallel to the ground as if it was at the last gasp (Collins, 2002). The marble sculpture was executed and found. The palace of Ashur Bani-Abel in Nineveh 'is currently preserved in the British Museum.

The scenes depicted are those that go back to the hunting scenes of King Ashurnasirpal II (883-859 BC) (Ayad, 2008). Furthermore, King Ashurbanipal (669–631 BC.) included a scene of the wounded lion, which was hit by a heavy arrow in his chest. It is noticeable in the figure of the wounded lion, which tries to maintain its balance; its body has curved forward in a state of convulsion while a torrent of blood flows from its mouth (See figure 11). This scene is carved from marble and was found in the palace of the king 'Ashur Bani-Abel' in Nineveh, and it is currently preserved in the British Museum. This technique can be seen in the 'Dying lion' (See figures 12).



Figure 11. *The wounded lion who was hit by a heavy arrow in his chest.* (Collins, 2002)



Figure 12. *Dying lion whose body was pierced by three arrows.* (Collins, 2002).

Another artistic model is a narrative scene carved in a prominent sculpture dating back to the Neo-Assyrian era that was found in the throne room in the northwestern palace of the Assyrian king Ashur-il II in Kalkhu (Rashid, 1986). The Assyrian art shows an enemy or a victim who fell under the legs of the horses pulled by the victor's chariot. In the back, the king stands, aiming his arrows at a lion struck with three arrows while the lion tries to attack the king's chariot (Gurtis, 2006). The lions were represented in this scene in a form that reflects the strength and ferocity of the attack in the wilderness. While the Assyrian king bravely portrayed this raging lion and aimed his arrows at him in an attempt to establish his unique abilities in front of his soldiers. This is because hunting lions was limited to members of the royal family to prove their abilities in front of people in courage and bravery and protect them. This technique can be seen in the victim who fell under the legs of the horses (See figure 13).



Figure 13. *The Assyrian art shows an enemy or a victim who fell under the legs of the horses. (Gurtis, 2006).*

Another important scene is a hunting scene belonging to King Ashur-Bani-Abel, depicting a chariot hunting process, as the king is shown throwing a spear forward while a wounded lion attacked by arrows appears from behind. This scene was found in the king's palace in Nineveh (Reade, 1999). This technique can be seen in the 'King Ashur-Bani-Abel' (See Figure 14).



Figure 14. *King Ashur-Bani-Abel, depicting a chariot hunting process. (Reade, 1999).*

Certain ceremonies accompanied the process of hunting lions. The Assyrian kings followed ceremonial rituals performed by the temple priests, during which music was played, and they began to sing and burn incense, and then holy water was presented to the king to pour on the dead lions. These rituals stem from a belief from the Assyrian thinking that lions become more dangerous when not performing these rituals because their spirits may track the hunter and take revenge, so the king should pour holy water on them to save himself. (Abdel Salam, 2021, pp. 225-248).

In this regard, another sculptural scene belonging to King Ashurbani-Abel was also found showing servants carrying sacrifices to put them at the base of the altar of fire; while the king walks and carries a cup in his right hand to pour holy water on the dead lions and give thanks to the goddess Ishtar ‘Gods of war. One of the attendees in the scene plays the lyre, and a table appears in the scene on which is a censer to burn incense, and this celebration is a usual ceremony of the essential rituals of worship among the Assyrians. This technique can be seen in ‘King Ashurbani-Abel’ (See figure 15).

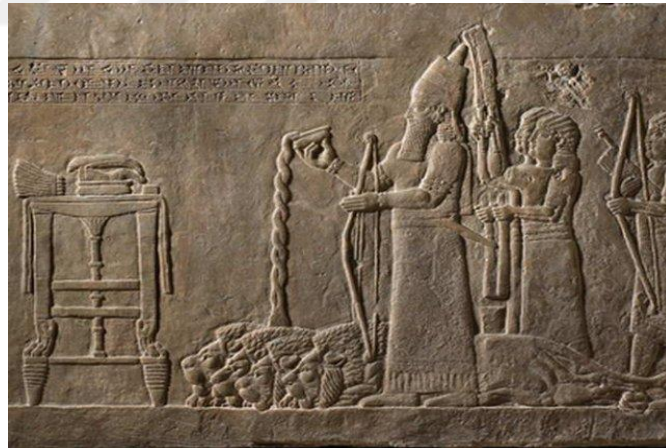


Figure 15. King Ashurbani-Abel was while walks, carrying a cup in his right hand.

(Reade, 1999).

Further, what is related to the lions is their young or the so-called cubs, which were depicted in the scenes of Assyrian art. In this regard, a prominent carving was found

that adorned the palace of King Sharrukin' which was built by Assyrian Sargon' (721-705 BC), representing at most a figure of a man wearing a robe up to the knee and above it and another robe that resembles the cloak open from the front. The robes are decorated with artistic elements and carefully fringes. The man's figure appears prominent, covering his face with a thick beard. As for his muscles, they seem to have the characteristics of strength and nobility, and he appears to be carrying a lion cub. The figure may symbolize the greatness of the king's stature and his ability to control the forces of evil, protect the palace and ward off dangers from the subjects (Reade, 1999). In this figure, a macho man can be seen in Dur-Sharrukin carrying a lion on his chest. Although these inscriptions do not have a significant title that proves the man's personality, archaeologists believe that he is Gilgamesh (See figure 16).



Figure 16. *Giant relief from Dur-Sharrukin thought to depict Gilgamesh subduing a lion. ("Sargon II," 2002).*

Among the most famous carvings of lions is the Lion of Babylon, a statue of a lion found in the ancient city of Babylon in Iraq in 1776 by a German archaeological

excavation mission. It is made of solid black basalt stone. This statue appears as a lion standing on a human person; its length is about two meters long and is placed on a platform about a meter in length that was found near the Hanging Gardens building (See figure 17). This statue was likely built by the Chaldean Babylonian King Nebuchadnezzar II (605-562 BC), but its shape and material made it more likely.

Scientists say that it may date back to the Hittites period, and other scholars said that it was likely to be one of the spoils that the Babylonians plundered during the reign of Nebuchadnezzar II during his raid on Hatti. The research states that the statue of the Lion of Babylon embodies the power of Babylon and the imposition of its authority on peoples. This sculptural piece was considered one of the essential civilizational evidence of Babylonian civilization in particular, Mesopotamian art in general, and human thought as a whole. Opinions differed about the historical reference of the statue 'the Lion of Babylon' and its ownership. Some say that it did not return to the Babylonians because its artistic implementation and design method were far from the Babylonian style of sculpture. This technique can be seen in the Lion of Babylon.



Figure 17. *The Lion of Babylon statue. Basalt. Neo-Babylonian period, reign of king Nebuchadnezzar, 605-562 BCE., Babylon.*

- ***The Bull:*** The bull is one of the animals that have existed in Mesopotamia since the Jarmo era in the seventh millennium BC, as evidenced by the archaeological remains of this era. Studies confirm the existence of two bulls, the first 'the wild bull' and the second 'the domesticated bull.' The wild bull was one of the important animals that the population used to hunt due to its presence in the Assyrian steppes at the time. This animal was taken as a symbol in Mesopotamia as a sacred animal and appeared with several deities that were revered at the time, especially the god Adad on a large scale. Among the related artistic scenes is a scene in which a bull is shown standing on it by King Ashur-apli II, 'Thunder God' standing on the bull, brandishing lightning bolts, and the king in this scene wears the distinctive royal hat. This scene was executed on a marble stone and is currently preserved in the British Museum. This technique can be seen in the carved of the 'Thunder God Adad' standing on the bull, brandishing lightning bolts (See figure 18).

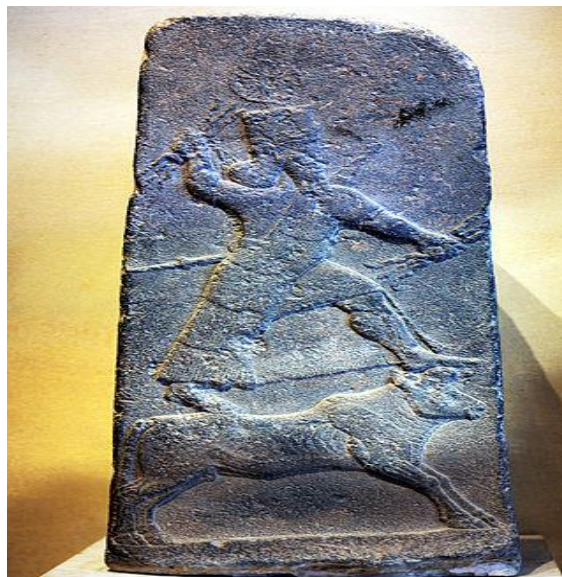


Figure 18. *An obelisk representing the god Adad on a bull with a storm in his hand, Louvre Museum. (Sabatino, 1960).*

The Assyrians' custom is to depict lions and beasts with human heads with long beards to impose prestige and incite panic. The photography was also very accurate with all the details of the hair, beards, head covering, and the case of the animal body from the bottom of the foot. The hooves were very clear, the muscles of the bull and its decorations, and the wing was also photographed. This technique can be seen in the winged bull 'Lamassu' with a human head' (See figure 19).



Figure 19. *Winged bull 'Lamassu' with a human head, guardian figure from the gate of the palace at DurSharrukin, Nineveh; in the Louvre.*

Sumerian lyre 'Sumerian era; a musical guitar with eleven strings inlaid with mother of pearl and gold, and its front is decorated with a bearded calf's head made of gold and a plate inlaid with mother-of-pearl. It was found in Ur and dates to the time of Princess 'Shebaad' from about 2450 BC., and the Sumerian harp is linked to the Sumerian royal cemetery in Ur. It is one of the holdings of international museums and a good ambassador for Sumerian Mesopotamian culture (Mohsen, 2019).

It is one of the reasons that made Mesopotamia precede the Greeks and the Romans in their cultures. Music is also one of the tools of power, with its entertaining, artistic version that may be accompanied by large parades, which have a direct impact on the conscience of people, especially when they are accompanied by the recitation of

religious and ideological hymns, as well as mobilization songs that glorify the king. In addition to accompanying songs mentioning epics and legends, music is a crucial part of the Sumerian culture and all subsequent civilizations in ancient Iraq.

The lyre of Ur was one of the Sumerian achievements related to its production, masking to performance. Such production was an advanced development; at a time when minerals were rarely used, and the process of melting metals required high and advanced capabilities. Manufacturing of golden products required high flexibility for formation, especially the shape of the bull's head, which represented a symbol of reproduction in Mesopotamian arts, virility, and fertility. This convergence can be compared to something of high importance, and its owner is likely to have a high status in Ur, which was found among mass burials, and it had special archaeological equipment specially prepared for its preservation. There are many other interpretations, and Ur gave a real cultural privilege herself; first of all, through her productions, she allowed showing her high culture in architecture, music, and poetry, literature, such as pottery, painting, and sculpture (Mohsen, 2019). This technique can be seen in 'the Sumerian era' (See figure 20).



Figure 20. *Sumerian lyre 'Sumerian era'.* (Mohsen, 2019).

.The Camel: Camels were known in Mesopotamia in the second millennium BC. The Babylonians and Assyrians possessed two types of camels. The one-humped camel may have come from the Arabian Peninsula, and the second type is the two-humped camel from Central Asia and settled in the mountains of Iran (Ayad, 2008). These animals were used as riding and transport animals. The camel is difficult to tame as a pet and cannot be moved from one place to another. As for the Assyrians, they tamed the camel and used it for transportation and military battles. Some camels were received by the Assyrians as taxes or gifts from the areas under the influence of the Assyrian state, according to the artistic scenes executed on the wall carvings (Ascalone, 2007). The most famous scenes of two-humped camels are the ones that appeared executed on the black obelisk of King Salman - Ashrid III'. This technique can be seen in 'the Assyrian camel' (See figure 21, a, b, c, d).

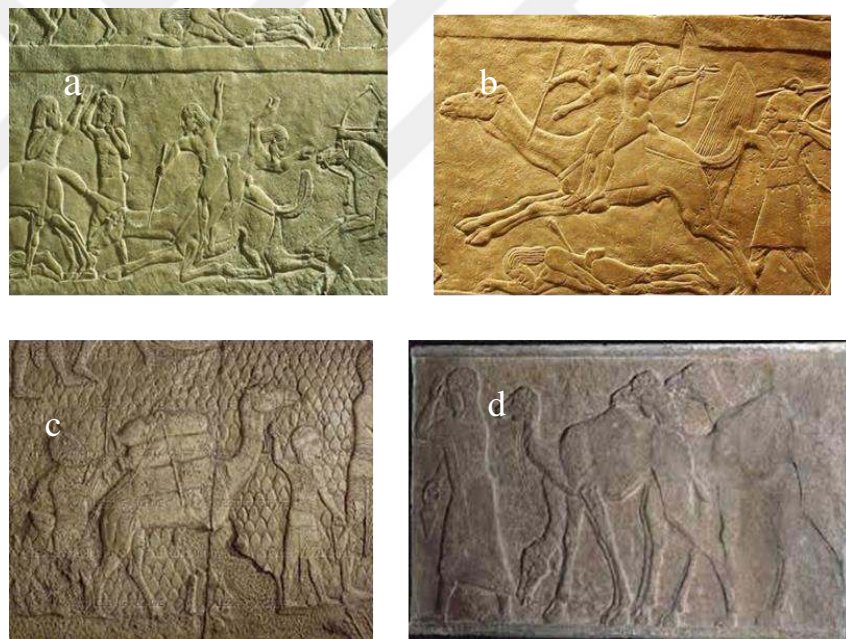


Figure 21. The use of the Assyrian gal in battles, (Collins, 2002), b) The use of the Assyrian camel in battles, (Collins, 2002), C) The Assyrian taming of the camel, d) Assyrians use camels to transport goods (Reade, 1999).

B.Plant ornament:The most important elements of Plant ornament in Mesopotamian art are as follows:

- **Trees:** Since the early historical times, the tree has been a symbol of life and fertility and a title for topics related to immortality. It was embodied in the Epic of Gilgamesh when it expressed this sanctity. It is described as its fruits are agate and bears blue and azure leaves. The oldest appearance of the tree's decoration was on the Assyrian seals dating back to the third century Ten BC (Al-Jader, 1972, p. 282). This technique can be seen in the most crucial tree decorations (See figure 22).

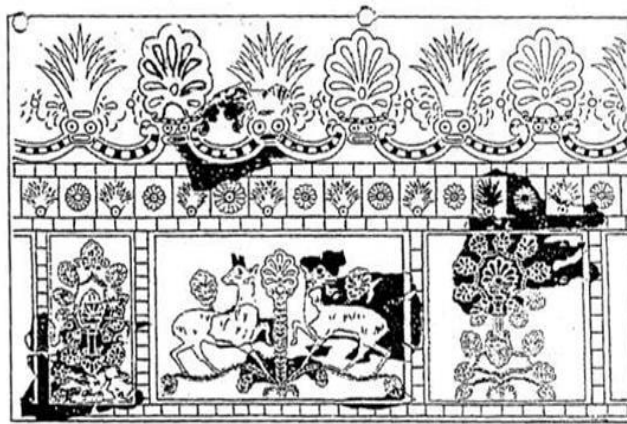


Figure 22. *The most important tree decorations that appeared in Assyrian art.*
(Mallowan, 1984).

Among the most crucial tree decorations that appeared in Assyrian art; where King Ashur Nasir Pal appears in one of the sculptures that decorated the throne room in front of the sacred tree, holding it with his left hand, while his right hand is raised perhaps to offer loyalty and obedience in a religious scene that the Assyrians used to repeat. It represents the purification process with holy water, as the sacred tree appears surrounded by complex creatures. In the right hand, each holds a cone, which is probably a pinecone, and brings it closer to the tree, and in the left hand, there is a bucket (Reade, 1999). This decoration is probably a symbolic expression of benevolence and giving. It is a symbolic decorative unit, one of the most creative

Assyrian decorative forms, and it is familiar in most of the Sumerian and Babylonian plastic art scenes.

The oldest depiction of the sacred tree was on Assyrian cylinder seals dating back to the fourteenth century BC. It appeared decorated with spherical fruits with animals on both sides (Smith, 1965). It was also found on small marble jars decorated with relief carvings, among which a drawing of the sacred tree appears (Wahhab, 1985). Perhaps he aimed the religious symbolic meanings from it, for the presence of the sacred tree in the center of the scene and the repetition of its branches decorated with fruits on both sides states its giving to resemble the permanence of life.

Perhaps this is the reason why the natural elements inspired the Assyrian artist after he altered the decorative formations to design the tree of life, some of which were in the form of a palm tree with three palm fans, each resting on a knot in the form of three rings emerging from the knot two small lobes whose heads are directed downwards. Several branches are branched from the palm's trunk in the form of thin, wavy branches that intertwine and intersect to form at their ends the base of small palmate fans (Yohanna, 1999). Sometimes it takes the form of a lily tree, emanating from its base four branches in the form of wavy lines with ends decorated with a rosette with three leaflets with a pointed end. King Sargon II appeared in front of this tree while practicing Religious rituals (Yohanna, 1999).

The decoration of the sacred tree appeared on a flat seal made of red onyx, on which were drawn two winged angels, in the middle of the sacred tree, with two birds behind each of them a star. In a cylindrical seal of red agate, the two ends of it are framed with gold, and a ring is connected to the upper end for hanging a scene representing the sacred tree, topped by the symbol of the winged god Ashur, and on either side of it two figures, one of whom wears a crown on his head (Hussein, 2000). The sacred tree is also depicted on the seals of the modern Assyrian era, and its branches are decorated with fruits in the form of the pinecone, and on either side

of it are two winged angels (Pierre, 1981). This technique can be seen in the sacred tree (See figure 23).



Figure 23. *The sacred tree is depicted on seals of the Neo-Assyrian period. (Pierre, 1981).*

- ***The Palm:*** The archaeological scenes stated that palm cultivation was known in Assyria, but whether they were fruitful palm trees or just for decoration is unknown. Alternatively, they were symbolically painted on the wall carvings to state the Assyrian dominance over the areas famous for their cultivation, especially the countries of Babylon (Suleiman, 1992). However, Arab and Islamic sources confirm the presence of date palms in the areas of Sinjar, Tal Afar, Mosul, Mahlabiya, Bashiqa, and Salamiyah (Majid, 1992), and the Assyrian sources mentioned a type of date palm called the North Palm and another type described as the mountain palm (Suhail, 1986). On a decorative box made of wood dating back to the thirteenth century BC, found in Assyria (See figure 24).

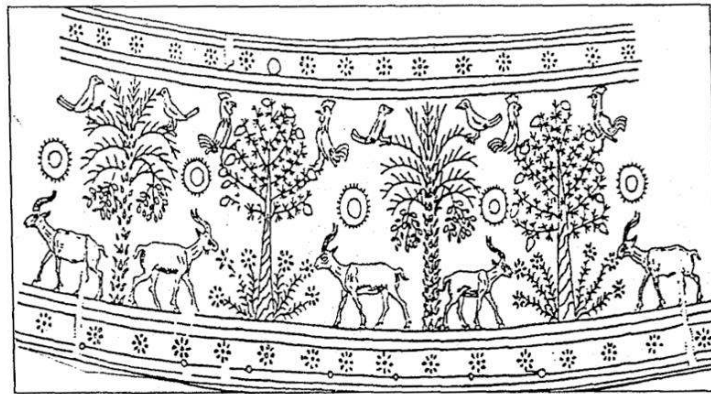


Figure 24. *Top decorative box made of wood.*(Smith, 1965).

It includes fruitful palm trees on either side, of which deer alternate with pine trees and birds. From that historical period, Assyrian cylinder seals were found that included a drawing of palm trees. Palm trees were engraved within one of the scenes on the obelisk of King Shalmaneser III (Frankfort, 1977). Also, floral motifs consisting of palm fronds, pomegranate shapes, and flowers decorated the frame that surrounded the mural of King Shalmaneser III's fortress (See figure 25).



Figure 25. *Obelisk of King Shalmaneser III.* (Les, 1982).

In the city of Dorshrukin 'Khursabad, traces of tree trunks surrounded by bronze bands decorated with inscriptions appeared on each side of the entrances to the temples of the gods Sin, Shamash, and Nergal. The excavator Blass restored the upper part of these trees by making them of palm fronds (Abd al-Rahman, 1982, pp. 277-312). Palm trees appear on a sculpture from the era of Ashurbanipal, showing two scribes writing down the spoils after a military campaign in Babylonia. It was also found in the sculpture that depicted the celebration of the victory over the land of Elam, as King Ashurbanipal appears sitting in the garden of his palace drinking a toast of victory. This technique can be seen in 'the King Ashurbanipal' (See figure 26).



Figure 26. *King Ashurbanipal appears sitting in the garden of his palace drinking a toast of victory. (Al-Yawar, 2000).*

The palm is shown among the trees, its fronds are arranged successively from the middle to the edges, so it appears in a beautifully decorative way in the form of a palm crown or the so-called solar conch. The decoration of the palm was also found on the ivory carvings. An ornament was engraved for a palm tree whose fronds were engraved in a bottomless pit on a flask of sacred oils (Safar, 1987). It was also found on an oval jeweled box decoration of a modified palm tree, a large part of which is missing, and it is made up of a palm tree consisting of three fronds on one side.

Others and on the top a frond standing and on both sides of the trunk of the palm, the two twists, hanging from between them to the bottom, a date palm (Safar, 1987).

- ***Ishtar Gate***: The Babylonian King Nebuchadnezzar II built the Ishtar Gate in Babylon around the year 575 BC. It was the eighth city gate and its main entrance. Its construction was part of Nebuchadnezzar's plan to beautify the capital of his empire. in the first half of the sixth century BC. (See figure 27) (Layard, 2007).



Figure 27. *Ishtar Gate*. (Layard, 2007).

The gate was attributed to the Babylonian goddess Ishtar because it was dedicated to her, although Nebuchadnezzar showed his loyalty to the rest of the Babylonian deities also by engraving various animal carvings on the gate, including small bulls or so-called 'akhus' (Layard, 2007) (See figure 28), lions and dragons' Serush or Moshcho' (as can be Seen in figure 29 and 30), which are symbols of the gods of Iraq the old; The lion symbolizes Ishtar; the goddess of fertility, love, war, and sex, in addition to the rest of the Gods that have been explained (Jordan, 2002).



Figure 28. *An animal carved on Ishtar Gate.* (Layard, 2007).



Figure 29. *A lion carved on the gate of Ishtar.* (Layard, 2007).



Figure 30. *A Dragon carved on Ishtar Gate.* (Layard, 2007).

The facade of the Ishtar Gate is decorated with glazed bricks with successive rows of dragons and bulls' carvings. Animal carvings are made in yellow or brown bricks, while the bricks surrounding them are blue. It is believed that the blue-painted bricks were made of lapis lazuli, but this is not confirmed. The height of the gate was more than 11 and a half meters, and it was equipped with an extension located on its southern side (Layard, 2007).

5. SHANASHEEL

Over the centuries, the Iraqi capital, Baghdad, and some provinces have been characterized by attractive designs and buildings inspired by the Baghdadi heritage. However, these landmarks disappeared during the past years, especially after 2003, due to the wars and neglect that affected them—stores for various goods or abandoned and dilapidated houses. These designs are part of the identity of the Iraqi heritage that every Iraqi is proud of. The last two years witnessed a great demand from citizens to design buildings and houses similar to those in ancient areas, such as Kadhimiya and Adhamiya, and the streets of Baghdad, such as Al-Rasheed and Al-Mutanabbi Streets. This technique can be seen in ‘Shanasheel.’ The Shanasheel is an architectural masterpiece that extends over the street or alley or inside the inner courtyard of the house ‘the courtyard and is built with wood carved with colored glass to allow women to see the neighborhood outside from inside their homes, especially when the neighborhood was closed and the design of the houses directed inward and not outside (See figure 31 and 32).



Figure 31. *Shanasheel* was found in the old Baghdadi houses, (Ishtar, 2015).



Figure 32. *Ancient Shanasheel design.* (Mahmood, 2014).

Dr. Samer Ahmed explained that the work included five levels on the surface of the mural and at a height of (15 cm) protruding from the surface of the mural.

The perforation technique was adopted to show the dimension and depth of the Shanasheel, and it is one of the very difficult techniques that require high skill and experience, and very few are found in ceramic murals at the level Iraq and the Arab world. For giving an aesthetic value and a high design to the magic lantern, clay was added to the tiles for the purpose of obtaining a shape that simulates the shape and movement of the lantern, which was decorated using plant leaves and oriental motifs.

6. ISLAMIC ORNAMENTS

Ornaments are one of the essential means in the aesthetic appearance of any product. Islamic ornaments originated wherever Islamic civilization has existed across the ages through distinguished artisans, which was far from direct artistic expression and the tendency to abstract ornamented elements (Eric, 2014). The plant and geometric elements are essential ingredients in building ornaments. Islamic ornaments are often combined in this kind of art, as each is sometimes unique. They were also divided into floral, geometric, and epigraphic. Islamic ornaments have been associated with architecture and applied arts products (Claire, 2012).

The Islamic era did not neglect art as one of the essential elements on which many cultures are based. Islamic art included all artistic production that arose between 622 AD and the nineteenth century AD. Islamic ornaments are one of the Islamic art techniques based on the use of many artistic means that increase the beauty and perfection of the artwork (Okasha, 1994). It is an Islamic art that achieves a work of art through which the beauty of each piece is highlighted by relying on principles inspired by Islam to reflect the strength of the relationship that this religion exists in architecture. Islamic ornaments have several types, which will be explained through the following lines (Hassan, 1998).

Islamic ornament was characterized by unity, continuity, repetition, diversity, abstraction, and movement. The latter resulted in spiritual engineering in a visual material way, and Islamic motifs may hear what no ear can hear as if it is a musical symphony played by us in the movement of ornament up and down and sees what no eye can see. As if its movement that speaks life, and color, shape, and texture are freed from the constraint of reality in an organized geometric system that carries within it a feeling and movement that generates a hidden feeling of spirituality when Meditate on it (Wilson, 1995). The designer's ingenuity appears in the diversity of rhythms in his architectural and ornament designs in an abstract building that combines the orderly formation of spaces and the dialectical relationship of

dimension and the impact of those spaces and their relationship to blocks (Hassan, 1998).

Islamic ornament is characterized by a set of characteristics, namely the expression of civilizations and the establishment of the Islamic state, documenting everything related to the foundations of the Islamic religion, and using the latest shapes and forms to present all that is new in this art and thus develop it (Mahmood, 2014). Using decorative lines in a distinctive aesthetic style produces attractive paintings. He does not resort to anthropomorphism, the use of live images of nature or man. The use of Arabic terraces and star polygons to create solid modern shapes. A departure from the decorative collection created from motifs inspired by endless imagination. Using decorative motifs free of living organisms in mosques highlights the impact of the Islamic faith and overcoming the problem of emptiness in decorating artifacts with repetition (Raafat, 2003). The artist depends on his imagination and not the reality in his drawings. Flat ornament is used a lot, and there is no prominent ornament. He was using less expensive materials to implement what Islam calls for, which is to avoid extravagance (Hassan, 1998). Among the most important characteristics of Islamic, ornament art is that the viewer's eye always moves between shapes and directions until he sees the drawing in all its details. Just as he moves in the details of one drawing, he draws on a shape that stops on it and then returns, and his eyes return to the drawing (Raafat, 2003).

Islamic decoration is beautiful (Hassan, 1998). Although the art of ornament is ancient, the Muslims worked on introducing everything new in it to develop it until all scholars realized it and the West called it Arabesque. When drawing motifs, Muslim artists like to fill in all the spaces by filling the background with lines or moving from a small space to a smaller one. So when the artist finishes drawing the painting, the viewer looks at it, and whoever displays the painting completes his drawing in his mind because the edges of the painting represent an involuntary end for the viewer. The lifeless drawings are considered one of the essential characteristics of the Islamic art of decoration, as the artist sought in his art to

transform nature drawing into a lifeless one by abstracting elements such as leaves and flowers and producing them in a new way that contradicts his nature, (Okasha, 1994).

6.1. CALLIGRAPHY ORNAMENTS

Arabic calligraphy ornaments relied on Arabic calligraphy as an essential element and one of the most important aspects of beauty. Although the inscription ornaments is an ancient type of Islamic ornaments. However, it still evolves and branches off by modifying it into simple and compound letter parts (Wilson, 1995). The inscription ornaments consists of several more than 80 types, and the Abbasid era witnessed the emergence of these ornaments. The inscription was used to record verses from the Noble Qur'an and the hadiths of the Prophet. Which were based on the Kufic script and intertwined with geometric shapes such as rectangles and squares (Al-Sayegh, 2001). The widespread use of this type of ornaments in writing Quranic verses and supplications in mosques to decorate them and give them an aesthetic form(Wilson, 1995).

6.2. GEOMETRIC ORNAMENTS

The Umayyad era witnessed the first use of geometric ornaments, and artists excelled in this art in a way unparalleled in any other art in any other civilization. (Al-Sayegh, 2001). The basic geometric shapes are used in geometric ornaments: triangles, squares, circles, straight lines, interlocking, double lines, previews, pentagonal and hexagonal shapes. Each shape is generally essential in Islamic ornaments (Hamed, 2000). The geometric ornaments were distinguished by their strong characteristics that appeared in the formations of star panels used to decorate the roofs of buildings and antiques such as antiques made of copper, marble, and wood and writing the first pages of the Qur'an in gold(Hassan, 1998).

6.3. PICTORIAL ORNAMENTS

Or the so-called human or animal ornaments. Because the artists trusted the living creatures of the units used in the ornament's work, in this type ornament, artists excelled in human and animal painting (Raafat, 2003). However, Muslim artists did not continue to use figurative ornaments and decided to stay away from them because it represents a form of paganism that was hated at the beginning of the Islamic religion (Okasha, 1994). Since the departure of Muslim artists, figurative ornament has gradually disappeared as a kind of Islamic ornament, and frescoes have been used instead. Many countries have developed the illustration industry, including Turkey, Iran, and India(Mahmood, 2014).

6.4. URBAN ORNAMENT

The floral ornament is evident in the art of Arabesques, where the branches and stems of plants intertwine or intersect in a spiral. It is called the art of securitization, and in this type of art, artists drew ornaments on antiques and buildings based on the forms of plants such as flowers, fruits, leaves, and tree branches (Wilson, 1995). The artists preferred filling in the blanks using these shapes after stripping them and transforming them from their natural form. This type of ornament was widely used during the ninth century AD and reached its peak between the twelfth and thirteenth centuries AD (Hassan, 1998). They were used for ornament domes, walls, and antiques made of porcelain, glass, copper, and book pages.

Mallawiya, or 'the Great Mosque of Samarra' is modern, and its uniqueness in form and the flexibility of the block's treatment and its membership are factors that enhance its aesthetic evaluation. The architecture in its construction of the Mallawiya relied on the block 'Mulwiya,' and its basis provides a solid primary material from which its construction is pronounced. It is not a complex form in terms of form, but what adds to the nature of complexity is the reason for the aesthetic connoisseur, its modernity, distinction, and loftiness. Not to mention the meaning contained in it, as it

is an expressive form of functional performance, just as the stairs constantly ascending to the top and the decreasing gradient in their diameter, which made us describe the twist with that majesty arising from the scale, which is enormous by measure. However, the vertical height 'axial equilibrium' gave the space a criterion that defines the architectural reference frame, providing the key to finding the proportions' horizontal and vertical,' a primary source of architectural vitality. Therefore, it is necessary to have a vertical axis to reach an artistic composition (Shukr, 1989). Moreover, it is an integrated aesthetic, giving the length of the mosque's courtyard a measure by which an excellent sensitivity to the architectural proportions can be found(See figure 33).

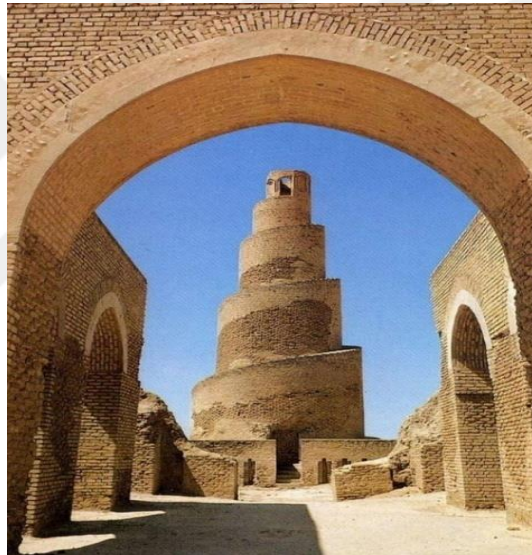


Figure 33. *The Minaret in Samarra 'Malwiya'.* (Shukr, 1989).

It is possible to install the aesthetic value of proportionality in the twisted minarets through:

- 1- The factor of complexity, 'the reason for the aesthetic taste,' is its modernity, distinction, transcendence, and the meaning involved as it is an expressive form of its functional performance (Shukr, 1989).
- 2- Expression by ingeniously transforming its functional meaning as a twisted

beacon into an aesthetic form using upward curves.

- 3- The systemic diversification and the organic unity that characterizes it. In addition to what the shape of the Malwiya contains from the suggestions of membership, especially in the gradation that takes place in its diameter. Furthermore, it is confirmed as a new style, clearly expressing the visual weight through the proportions and the method of architectural treatment as an embodiment of the vertical axis. The latter supports the vitality and dynamism of the rounded and graduated by breaking the intensity of the relationship with space and making it more streamlined the overall scheme of the mosque (Shukr, 1989).
- 4- High aesthetic formulation of the shape of Helicobacter.
- 5- Proportionality that expresses luxury.

7. SUGGESTED MODELS FOR PRECAST DESIGNS

Five models were selected in a precast concrete fence with historical shapes specific to ancient Iraqi art. To highlight these monuments and arts at present, which give a unique historical aesthetic to Iraq and a model for the design of Mesopotamian ornaments and a model for Shanasheel.

All models are in ready-made concrete fencing designs, an economic and civilized phenomenon manufactured within European specifications and against groundwater. It is made of concrete slabs, each with a width of 200 cm and a height of 50 cm. These dimensions may change according to design and technical reasons. It is installed inside two columns, each 270 cm high. 70 cm of it is embedded in the soil, the width of each column is 15 cm, and the thickness of the columns is also 15 cm. All fence parts shall be made of resistant cement, washed sand, crushed gravel, hardened chemical additives, and armed with the best reinforcement method—high safety specifications, resistance to external shocks, and resistance to groundwater and climatic conditions. The specifications of these fences are also the high speed and accuracy in the implementation, where all the pieces are pre-equipped and ready for installation. Also, these fences are characterized by the possibility of dismantling, transporting, and re-installing them in another place quite quickly and at a low cost.

Technically, these fences have a terrific aesthetic because of the possibility of forming with any inscription or drawing to express the place to be fencing, historical or scientific, or any work whatsoever. Also, among the features of these fences is the possibility of dyeing and colouring, which gives a variable aesthetic that can be painted many times and in the desired colours. These models will be explained as follows:

7.1. THE CONCRETE FENCE IN THE SHAPE OF ISHTAR GATE

There is no doubt that everyone who saw the Babylonian Ishtar Gate proudly inside the Pergamon Museum in German, whether when visiting that museum or through

television or even seeing its many pictures in books, magazines, or on the internet, must have thought of many impressions. Perhaps the first of these is the enormity of the structure, the magnificence, and the accuracy of the engineering and technical details executed in it. They illustrate the symbolic importance of this architectural masterpiece which is dominated by awe and grandeur worthy of a people like the people of Mesopotamia who built it.

It is one of the most important architectural features discovered during those excavations. The portal model was designed using Cinema 4D program; some retouches were made using Adobe Photoshop 2021. It was noted that the design combined the splendor of the building and aesthetics. What gave it its beauty and glamorous splendor were the excellent inscriptions that adorned it. It was colored in blue in addition to some other colors such as yellow, white, green, brown, and black to make them together a masterpiece for consideration and is distinguished by the refined artistic style and high taste, which combines the consistency of colors, the accuracy, and symbolism of the executed shapes and their meaning.

One of these shapes is the dragon is a prominent sculpture, the style of the sculpture is symbolic, and the symbolic style is characterized by taking several forms of nature and mixing them into one form, so the final form becomes a 'mythical' object that does not exist in nature, which is known as surreal art. The dragon is a symbol of the god Marduk. Its head and tail are a snake. The back ends are an eagle, the front is a lion, and the body resembles a dog's body. It represents one of the glazed brick murals of the Neo-Babylonian era. The hypothesis that it is a real creature is incorrect. Many sculptures and symbols do not exist in nature, but the ancient Iraqis embodied them with their artistic sculptures, such as the Assyrian angel, the winged bull 'Lamassu,' and 'Pazuzu', King of the Evil Wind.

Furthermore, these shapes are nothing but symbols to embody things that exist in nature, as the ancients believed that behind every natural phenomenon, there was a God responsible for it. This technique can be seen in the first model It is a work of

art symbolizing Iraq in general and the province of Babylon in particular, which gives the advantage of using this design for the fences of historical places such as museums, history colleges, and antiquities departments. Not to forget the tourist and recreational places that this design can express the ancient history of Iraq and the beautiful art from ancient times (See figures 34, and 35).

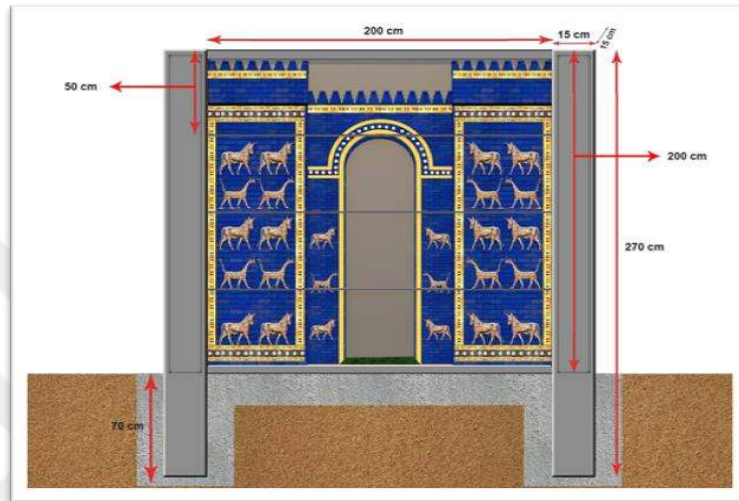


Figure 34. *Design a concrete fence model for Ishtar Gate.*

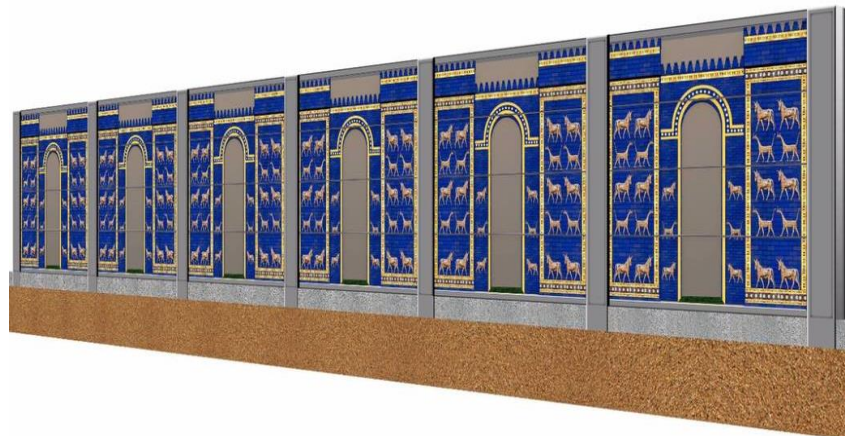


Figure 35. *Design a full concrete fence model for Ishtar Gate.*

7.2. THE CONCRETE FENCE IS IN THE SHAPE OF 'LAMASSU' OR 'WINGED BULL.'

The first model was an urban model, so the historical animal model was chosen as the second. The second sample is also historical, as the winged bull 'Lamassu' was used to design this fence. 'Lamassu' is one of the most famous Babylonian animal embodiments. It was noticed that the Sumerians used to draw lions and monsters with human heads and long beards to impose prestige and provoke panic, where they were placed in the doors of palaces and temples to fortify the place. The photography was also entirely accurate with all the details of the hair, beard, and head coverings, as well as the condition of the animal's body. From the bottom of the foot were very pronounced hooves, muscles, and adornment of the bull. The pavilion was also photographed.

This model also reflects the history of Iraq and ancient Iraqi art and can be used on the fences of zoos to add a historical, artistic fragrance or on farms and many other places. Also, for design reasons, the design was divided into two pieces, each piece 200 cm wide and 100 cm high, unlike its first counterpart, the Ishtar Gate, which was divided into four pieces, each piece 200 cm wide and 50 cm high. As shown in Figure 36, dividing 'Lamassu' into two pieces only highlights its delicate inscriptions because the considerable number of parts may reduce the accuracy of the ancient Assyrian sculpture. This technique can be seen in the second sample (See figure 36).

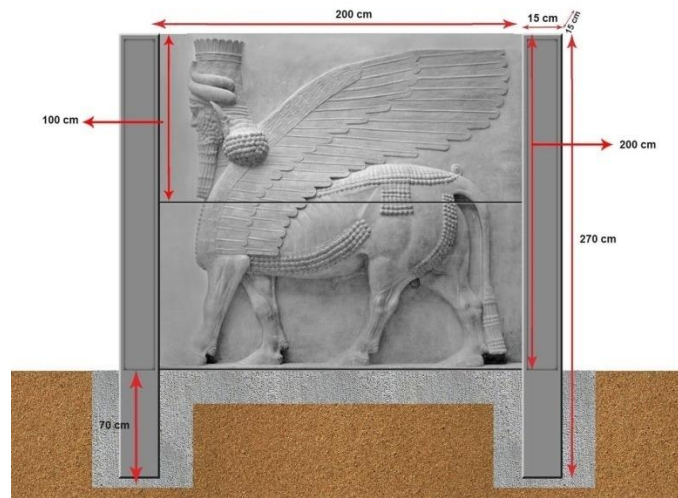


Figure 36. *Design of a concrete fence model of a winged bull 'Lamassu'.*

7.3. A MODEL OF THE BABYLONIAN LION AND THE BABYLONIAN PALM

The artist adopted Babylonian art in his design. He mixed the Babylonian animal and plant inscriptions. Through his use of the Babylonian lion, it can be seen that the lion raised its tail, and its mouth was open, meaning that it was in a position of preparation for an attack. The Babylonians used to put this lion on the right side of the fence of the procession street to receive visitors to the city of Babylon. While on the left side, they put the lion and its tail in a low position because the left side is the direction of the visitor's exit from the city. As for the lion in general, it is a Babylonian symbol and even a symbol for the Iraqis, the country of lions. Today, the Iraqi football team is called the lions of Mesopotamia. The other counterpart of the Babylonian or Iraqi symbols is the palm tree, which represents Iraq as a botanical symbol. Iraq was famous for this type of plant. And it was noticed from Figure 37 that the palm does not bear fruits, as it is perhaps one of the ornamental trees like the palm trees on the beaches (See figure 37).

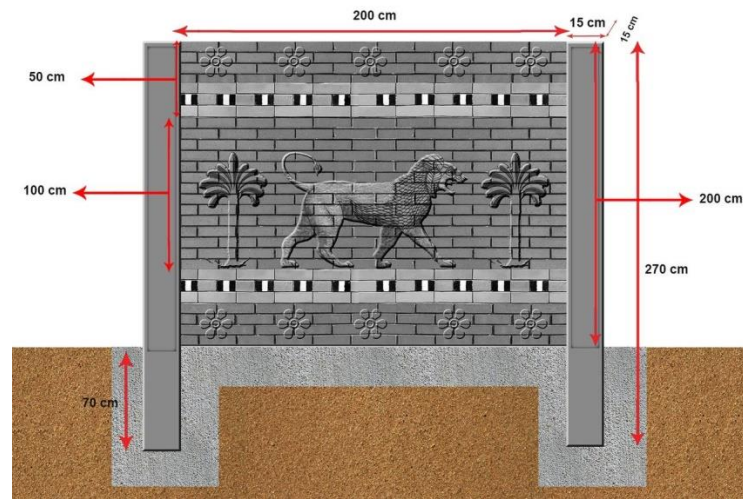


Figure 37. *Model design of a concrete wall combining Babylonian animals and plants.*

The palm trees were selected in this research; because they are a symbol of present Iraq as well, and not only ancient Iraq, that is why Iraq is called the country of blackness; because it appears from the black air because of the palm fronds that covering it, the most significant number of date palms in Iraq has reached 20 million. Furthermore, several sunflowers were scattered above and below the fence to state the plant diversity of Iraq and the bright sun of Iraq, so Iraq was also called the country of the sun. All the above was placed on rows of parallel and monolithic bricks to give a view similar to the fence of Procession Street, which is linked to the Ishtar Gate. It was noticed that the three rows below, the upper sunflower, and the upper, the lower sunflower, came in different gradations so that the lower rows look like the ground for a lion and palm trees, and the upper ones are like the sky. The wall was divided into three large pieces in this research, each with a width of 200 cm, and the height of the first 'upper' 50 cm, the second 'middle, containing palms and lions 100 cm, and the lower 50 cm as well. So that cutting the fence does not affect the inscriptions.

7.4. A MODEL OF ISLAMIC GEOMETRIC INSCRIPTIONS AND INSCRIPTIONS IN ARABIC SCRIPT

The Ottoman Islamic geometric inscription was chosen, which has the advantage of being a new form of knots in which the two straight sides are slightly concave outward. Moreover, the use of adjacent pointed arches declined. Therefore, it was replaced using adjacent circular knots. The design was divided into two symmetrical parts in the Ottoman inscription, whose inscriptions are distinguished by the aesthetically pleasing geometric design. In the upper part of the design, the phrase 'In the Name of God, the Most Gracious, the Most Merciful' was placed in the Kufic script. It was added because of its benefits in preserving the home and expelling evil. It was noticed that the use of Islamic fonts and verses in many of the fences of houses in Iraq today. In the second section, the Qur'anic verse "Say I seek refuge in the Lord of daybreak" was placed, which benefits expelling the evil eye and envy. The design was made with a width of 200 cm and two sections of 100 cm each. This technique is best seen in the fourth sample (See Figure 38).

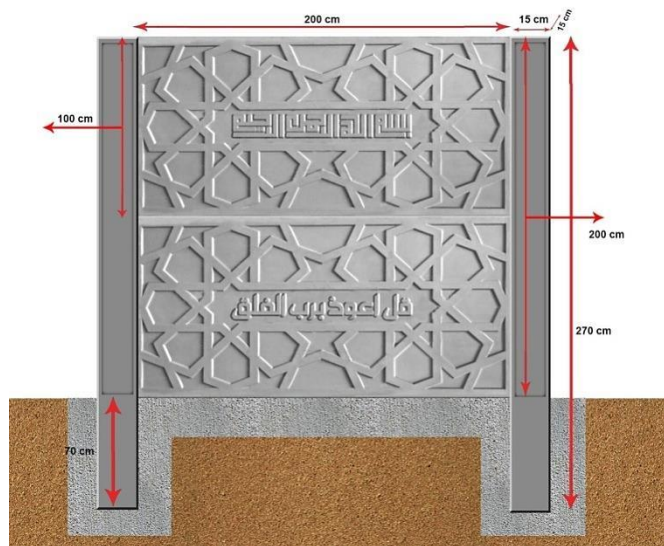


Figure 38. *A model design for a concrete wall that combines the Ottoman Islamic inscription and Quranic fonts.*

7.5. A MODEL OF THE SHANASHEEL MURAL

Although this word does not have a specific definition, it expresses the protrusions formed on the house's second floor towards the streets or are prominently located on the murals. So, it is considered one of the modern Iraqi arts. At first, the mural was drawn on paper; then, the Cinema 4D program was used to design the mural and Adobe Photoshop to add some frills. On the left of the mural from the bottom, a river of water appears clearly and powerfully, which states the great Tigris River, and on the bank of the river is a Babylonian palm, which is one of the second indications of Mesopotamia and one of its symbols. This technique can be seen in the fifth sample (See figure 39).

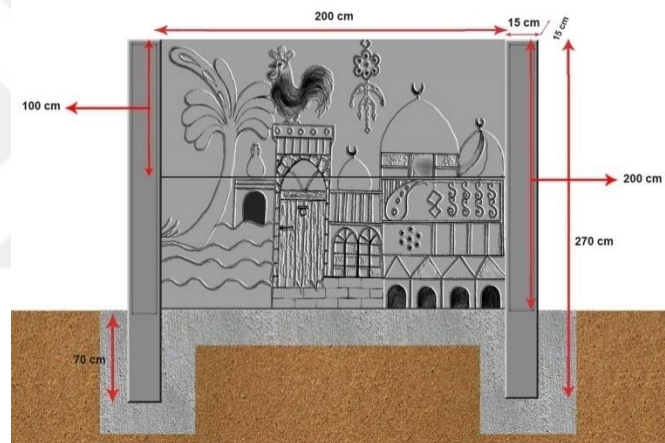


Figure 39. A model design for a concrete wall that combines the Shanashel mural.

palm, stating ancient Iraqi customs in the summer. At sunset, they sprayed the roof of the house with water and then filled the jar with water; even when they sleep at night on the roof of the house, the weather is cold, and the water in the jar too, after the door of a house and a rooster rising on its roof were seen. The first indication of the rooster is the dawn because, at dawn, the rooster takes the place up high to start crowing. As for the second indication, it is one of the animals that were being bred in abundance during that period. The wooden door containing a lever used to knock on the door was also noticed and with several giant nails. The higher the number of

these nails states the house owners' high social and financial position. Above the model's middle, a chandelier was also noticed in its beginning. This chandelier represents the blue eye 'the seven eyes, whose primary goal is protection from envy. There are also domes with a crescent on top, which is an indication of the mosques in every neighborhood of that period. Beneath those domes are a group of houses with low decorated roofs' balconies in which they sit in the afternoon. The model was also divided into two pieces.

All of these models were designed using Cinema 4D and Photoshop, where the following steps were taken:

A- Side pillar design:

- Open Photoshop 2021, then click on the “New Create” option to do a new work (BSD).
- Choosing the unit of measurement ‘cm’.
- Choose a resolution of 300 pixels per inch
- Choose ‘color mode’ system (CMYK) because the design will be printed
- Choose a white background color.
- Choose the selection tool to draw a longitudinal rectangle measuring 15 cm x 15 cm and 270 cm long.
- Fill the rectangle with a gray color that resembles the color of concrete using the (Edit - Fill) option.
- Click on the (FX) menu to give the column shape the shadow effect by clicking on the word ‘Shadow’.
- Give the column the effect of a prominent shape by clicking on the word (FX-bevel emboss).

B- Design of the precast piece:

- Draw a rectangle using the selection tool with a length of 200 cm, a width of 50 cm, and a thickness of 5 cm.

- Insert the images into the program that were previously drawn on A4 paper.
- Modify it and give it a professional look using the Cinema 4D program.

7.6. STAGES OF MANUFACTURING PRECAST PARTS

1- Making the design required to be executed on the computer using ‘Cinema D4’ and ‘PhotoShop’ or ‘ArtCAM,’ which is linked with a CNC machine to carve the design on a piece of unique wood (See figure 40)

2- The piece of wood on which the mold is to be poured is coated with a transparent liquid insulating material that isolates the piece of wood and prevents it from sticking to the mold using a fiber-class material (See figure41).

3- After that, a mixture of materials is made with a specific percentage, such as polyester, jelcut, and castles.

The materials used are:

- Jelcut is the first soft layer, and its color is white or transparent; the color the customer wants is chosen as it has unique pigments.
- Polyester is the primary material in fiberglass compounds, and it is one of the essential elements that make polyester, i.e., styrene, a semi-colloidal liquid substance with several types.
- Castles, known as hardener or dryer, is used to dry polyester and jelcut and has a certain percentage so that it does not increase or decrease.

4- A layer of fiberglass is added, then dip the dye brush in the mixture and hit the fiberglass layer to give the stereoscopic shape of the mold. Then it left to dry, put another layer of fibers, rub it with the mixture and leave it to dry. It is possible to make several layers according to the thickness of the mold required to give strength and durability (See figure 42).

5- After 24 hours, the fiberglass mold can be removed from the piece of wood and cleaned of impurities, if any, and it is reinforced with iron to bear the work.

6- Finally, the concrete mix materials are mixed, cement, with gravel and sand in specific proportions, using the mixer with the addition of strengthening chemicals.

After that, the concrete mixture is poured into the fiberglass mold, and the reinforcing grilles are put in to give strength and durability to the precast piece; then, it is left for some time to dry, and then it is transferred to the work site(See figure 43).

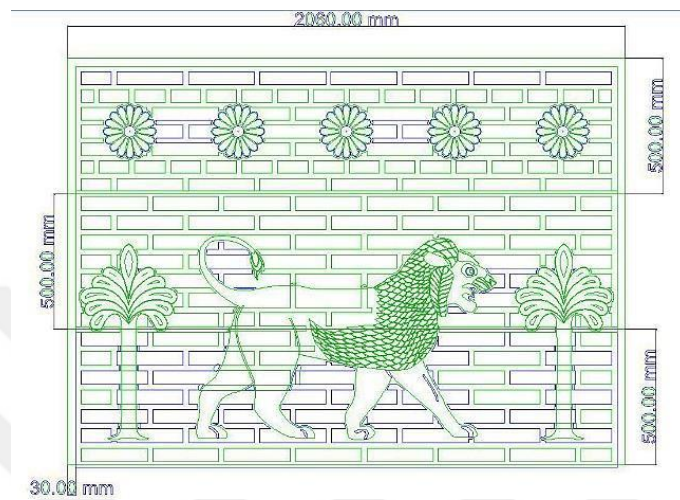


Figure 40. *The first stages of precast on a computer.*



Figure 41. *The design model is carved on a piece of wood.*



Figure 42. *Sample of several mold of fiberglass*



Figure 43. *Putting the concrete mixtures in a specific mold to form precast.*

RESULTS AND CONCLUSION

The study employed Iraqi inscriptions in the precast concrete material to design the prefabricated fences; where the Iraqi inscriptions can be divided into three main types, the first of which are the ancient historical inscriptions 'Babylonian, Assyrian, Akkadian, and others. Then followed by the Islamic inscriptions 'geometric, botanical, calligraphy, etc.' The last of them is the contemporary Iraqi inscriptions, which Shanasheel represented. The murals reflected the extent of the Iraqi artist's ingenuity, and that these beautiful murals were not the result of chance but rather the result of accumulated experiences, and how the artists were able to express their desires clearly and skilfully.

Murals are also one of the primary forms of communication that the world has witnessed, and murals always convey peoples heritage, history, and thinking because they carry a cultural message on the one hand and an aesthetic message on the other. The old Iraqi artist made two types of murals which are murals and wall carvings. It can be noted that the mural carvings have reached us only compared to the mural paintings, which are almost non-existent due to their inability to withstand natural conditions and erosion factors.

In terms of artistic formation, the ancient Iraqi artist used everything around him as art forms for purposes and signals to understand and tame the world around him for his benefit, as mural art made it one of the most prominent arts that tell the world about the glories and greatness of the civilization of Mesopotamian. The Assyrian murals were distinguished by clearly showing the characteristics of the physical strength of the Assyrians in the form of predatory humans. The Assyrian artists are also distinguished by their accuracy in expressing animals, emotions, and movements compared to their depiction of human bodies. The artistic composition of the Assyrian murals is also distinguished by the third dimension of the mural 'depth', which is almost entirely like reality.

In terms of the practical aspect of the research, the ancient Iraqi inscriptions were used as symbols in the design of precast concrete and in the form of fences, allowing them to reach the recipient because they are placed in outside and seen by many passers-by. It is also possible to color those ready-made concretes in selected colors more than once. In terms of strength, precast concrete fences are more robust and durable than ordinary fences due to the columns in which the murals are placed, and for every two or three meters according to the width of the mural. Also, precast fencing is much cheaper and faster to complete than ordinary fences, which is fixed, immovable, and characterized by easy re-installation. Regarding sustainable development and environmental preservation, precast fences last much longer than ordinary fences. If they fall, they are less dangerous than ordinary fences. The environmental damage is much less than ordinary fences due to the very high carbon emissions in the brick manufacturing process and the high temperature.

Urban forms were used as symbols in this research ,as in Ishtar Gate, and animal forms such as the lion and the winged bull 'Lamassu'. The forms of plants, as in the Babylonian palm and sunflower, are forms inspired by the ancient civilization. The Shanasheel mural is inspired by folklore and the Iraqi environment and represents most of the details and customs of that era. It contained animal symbols such as the rooster, botanical symbols such as the palm tree, urban symbols such as the Shanasheel, and spirituality such as the blue eye used for envy. The Islamic mural was inspired by the Ottoman Islamic decoration, especially the calligraphic decoration in which the Qur'anic verses written in Kufic script were added to certain connotations such as preservation and protection from envy.

Through what was explained in the previous chapters, some results can be divided into paragraphs and points that will be summarized; the murals were divided into sections but were not executed in a panoramic manner to connect the mural parts. The murals also reflect the extent of the Iraqi artist's ingenuity; these murals were not the result of chance but accumulated experiences, which enabled the artists to express their desires clearly and skilfully. It can be said that murals are considered

one of the primary forms of communication that the world has witnessed, as they convey peoples heritage, history, and thinking. It is a cultural and aesthetic message at the same time. The old Iraqi artist could exploit everything around him and turn it into artistic forms and wonderful connotations that express the life around him. These arts can be seen through the murals that have remained preserved to this day, representing the greatness and civilization of Iraq, ancient and modern. Murals in ancient Iraq are divided into two forms of art. The first formation is mural paintings and the second is mural sculpture.

In addition, the Assyrian murals showed the physical strength characteristics of the Assyrians through predatory animal figures such as the lion. So that the Assyrian artists accurately express animals, emotions, and bodily movements. Urban shapes were used as symbols; as explained in the Ishtar Gate, the lion, 'Lamassu' or 'the winged bull,' and plant shapes in palm and sunflower. The ancient civilization inspires all those symbols. The Shanasheel mural is inspired by the Iraqi heritage and environment, as it represents the details of life in that era.

This study is distinguished from the previous studies by achieving cultural, industrial and intellectual communication between the past and present throughout designing those shapes and decorations on precast pieces made of reinforced concrete bearing heritage symbols derived from the Iraqi civilization, which has a longer life and can withstand climatic conditions and thus achieve its goal for the longest period of time.

It should be noted that the employing of Mesopotamian shapes and decoration in precast concrete and design them in the form of walls gave the ability to communicate these designs with its symbolize to the largest possible number of recipients. In addition to that, the possibility of re-disassembling, transporting and installing them in another place, and the possibility of painting them in different colors. Through what was explained in the previous chapters, some results can be divided into paragraphs and points that will be summarized:

1- Different shapes and symbols were used in mural works, such as 'animal, botanical, historical, Islamic, and Shanashael, which gave the precast fences a distinctive identity represented by any possible shape or decoration according to the place and need. The work was also distinguished by the possibility of re-transfer, installation, and colouring, which is a qualitative leap in the artwork industry.

2- Islamic ornaments and architectural elements are flexible and suitable for all ages in their use and employment. They give an aesthetic form due to the spiritual energy they carry in their designs.

3- Historical decorations are positively reflected in the thought of their beauty and the influence of the human spirit and art in them.

4- There is an aesthetic relationship between the ornament's employment and precast concrete parts.

5- This method from artistic works contributes in the development of the innate sense of the individual and the advancement of aesthetic taste.

6- The murals always convey people's heritage, history, and thinking because they carry a cultural message on the one hand and an aesthetic message on the other. The painted murals do not last if the mural carvings due to the natural conditions over the years, which removes the colours or the drawings.

7- The method of artwork can achieve cultural, industrial, and intellectual communication between the past and the present by designing heritage ornaments on precast. These Designs bear heritage symbols derived from Mesopotamian civilization, which can withstand climatic conditions and thus achieve their goal for a more extended period.

8- These designs reflect social values and community ideas including those that contribute to the preservation of history, community cohesion and the development of artistic taste.

9- The pieces of the precast are characterized by strength and durability and withstand the conditions of the climate as well as speed in completion, cost less and preserve the environment.

10- There are companies working in the field of precast but they adopt a different style of designs, they use simple and non-heritage traditional designs, this study is a motivation for those companies to use historical forms and ornaments.

11- Interest in the study of decorative arts because of its great role in achieving social, cultural and intellectual communication between the past and present of the country.

12- The need to use historical symbols and shapes in the designs of government building projects by design engineers.

REFERENCES

- Abd al-Rahman, A. Y. (1982). *The palm in the civilization of Mesopotamia: Mesopotamian literature*. Mosul University.
- Abdel Aziz, A. (2019). Philosophical concepts of Islamic art as an introduction to the application of geometric lattices in wooden murals. *Journal of Artistic Works and Folklore*, 19(2), 1-33.
- Abdel Razek, K., Abdel Wahab, M., & et al. (2016). Benefiting from Islamic architecture in the Abbasid era as an introduction to contemporary design. *Journal of Specific Education Research*, 2016(43), 271-290.
- Abdel Salam, E. G. M. (2021). Mural Drawings, a Comparative Study between the Drawings of Ancient Iraq and Ancient Egypt. *Iraqi Academic Scientific Journals*, 8(23), 225-248.
- Abdul Majeed, N., Adnan, S., & et al. (2010). *Employing vocabulary from the Akkadian civilisation to design mechanical carpets*. House of Style and Textile Research.
- Abdullah, S, (2021). *The importance of the association of murals with the environment and place in the design of architectural facades*. Higher Institute of Applied Arts.
- Abdel-Majeed, N. A., Ali, A., Adnan, W., &Kadhim, S. (2010). *Employing vocabulary from the Akkadian civilization in the design of mechanical carpets*. *Iraqi Industrial Information Repository*. Retrieved in 31 October, 2022, from <https://www.iiir-mim.gov.iq/xmlui/handle/123456789/597>
- Al-Jader, W. (1972). *Crafts and handicrafts in the late Assyrian era*, (Vol. 1). Al-Adib Press.

- Allen, E. (2009). *Fundamentals of building construction materials and methods*. Hoboken, NJ: John Wiley & Sons, Inc.
- Al-Qaher, S. T. (1987). *Art in the Ancient near East, Egypt, and Iraq*, (vol. 1). Dar Al-Nahda Al-Arabiya.
- Al-Sayegh, S. (2001). *Islamic art: Readings and reflections on its aesthetic philosophy*, (vol.1). Dar Al Maaref.
- Al-Taie. E., Al-Ansari. N., &Knutsson, S. (2012). The progress of buildings styles and materials from the Ottoman and British presence in Iraq. *Journal of Earth Sciences and Geotechnical Engineering*.
- Al-Yawar, T. R. (2000). *The Palm in Arab and Islamic Art, its Origin and Development* (vol. 1). Baghdad Sumer.
- Al-Zarq, N. Q. M. (2017). *For plastic art and communication theory* [Unpublished Master's thesis]. University of AbiBakr.
- Ascalone, E. (2007). *Mesopotamia, Assyrians, Sumerians, Babylonians*. University of California Press.
- Ayad, S. B. (2008). *Livestock in ancient Iraq* [Unpublished master's thesis]. University of Mosul.
- Baqir, T. (1986). *An introduction to the history of ancient civilizations*, (vol.1.). General Cultural Affairs House.
- Bassim, A., Salih, M., &Alobaydi, D. (2020). Metaphor of symbols of Iraqi architecture and urbanism: Studying symbols as identity of governmental buildings' façades in Baghdad, Iraq. *IOP Conference Series: Materials Science and Engineering*, 745(1), 012157. <https://doi.org/10.1088/1757-899x/745/1/012157>.

- Claire, D. E. M. (2012). *Art of the Islamic world a resource for educators*. The Metropolitan Museum of Art.
- Collins, B. J. (2002). *A history of the animal world in the ancient near East*. Brill.
- Elliot, K. S. (2017). *Precast concrete structures*. CRC Press.
- Eric, B. (2014). *Islamic geometric design*. Thames & Hudson.
- Frankfort, H. (1958). *The art and architecture of ancient orient* (1st ed.). Published by Penguin Books.
- Frankfort, H. (1977). *The art and architecture of the ancient orient*. Published by Penguin Books.
- Gavlikowska, K. (1995). *Art in Mesopotamia*. Springs House.
- Gurtis, J. E. (2006). *Art and empire*. The British Museum.
- Hamed, M. M. (2000). *The development and analysis of engineering systems in Islamic arts and how to benefit from them in the areas of correction* [Unpublished master's thesis]. Helwan University.
- Hassan, Z. M. (1998). *Islamic arts*. Al-Nahda Library.
- Hussein, M. M., & Suleiman, A. (2000). *Nimrud, city of golden treasures*. Freedom House for Printing.
- Ishtar, T. (2015, May 23). *Baghdad breathes plastic art with the return of (Gulbenkian) to life*. Ishtar Tv Com.
<https://www.ishtartv.com/viewarticle,61105.html>
- Jordan, P. (2002). *The seven wonders of the ancient world*. Longman.
- Karim, H. A. (2003). *Royal obelisks in ancient Iraq* [Unpublished Master's Thesis]. University of Mosul.

- Krabbenhøft, K. (2019). Practical design and modelling of precast concrete structures. *In Current Trends in Civil & Structural Engineering*, 3(2). Iris Publishers LLC. <https://doi.org/10.33552/ctcse.2019.03.000560>.
- Layard, A. H. (2007). *The court of Nineveh in the crystal palace librar*. Dar al-Ma'mun.
- Les, D. (1982). *Mesopotamia*. Library of the Iraqi Museum.
- Mahmood, S. A. (2014). *The Philosophies of experiences between East and West, a critical and analytical studies* [Unpublished doctoral dissertation]. University of Helwan.
- Majid, A. S. (1992). *The Food Industry in Ancient Iraq* [Unpublished master thesis]. University of Mosul.
- Mallowan, B. (1984). *The Assyrian tree*. Sumer.
- Mohsen, S. H. (2019). The role of power in ancient Iraqi sculptural works. *Journal of University of Babylon for Humanities*, 27(7).
- Muslim, M. (25 May, 2017). *History of reinforced concrete*. Aljazeera Net.<https://bit.ly/3zuCRh6>
- Okasha, T. (1994). *Philosophical values in Islamic architecture: Art history*. Dar Al-Shorouk.
- Pierre, A. (1981). *Art in the Ancient World: A Handbook of Styles and Forms*. Rizzoli.
- Precast concrete*. (2006, March 29). Wikipedia, the free encyclopedia. Retrieved July 25, 2022, from https://en.wikipedia.org/wiki/Precast_concrete
- Qora, A., &Yaqoub, N. K. (1996). *Ready-mix concrete, the engineer's guide to construction and building works*. (n.d.).

- Raafat, A. A. (2003). *The Trilogy of Architectural Creativity: Environment and space in architecture*. Dar Al-Tahrir Press for Printing and Publishing.
- Rashid, S. Q. (1986). *Archaeological discovery in Iraq*. Baghdadi General Organization for Antiquities and Heritage.
- Reade, J. (1999). *Assyrian Sculpture*, (vol.2). The trustees of the British Museum.
- Sabatino, M. (1960). *Ancient semitic civilizations*. Putnam.
- Safar, F., & Al-Iraqi. (1987). *Ajyat Nimrud: General foundation for heritage*. (n.d.).
- Sahib, Z. (2011). *Babylonian arts* (1st ed.). Dar Al-Jawahiri.
- Sargon II. (2002, October 6). Wikipedia, the free encyclopedia. Retrieved August 8, 2022, from https://en.wikipedia.org/wiki/Sargon_II
- Samia, A. (2021). *The importance of the association of murals with the environment and place in the design of architectural facades*. Decoration Department, Higher Institute of Applied Arts, New Cairo Academy, Digital Document ID: 10.21608/MJAF.2021.64907.2235.
- Shukr, I. A. (1989). *Theories of beauty and their applications to Abbasid architecture* [Unpublished Master thesis]. University of Baghdad.
- Smith, W. S. (1965). *Interconnections in the ancient near East* (1 ed.). Yale University Press.
- Steinle, A., & et al. (2011). *Precast concrete structures*. Ernst & Sohn.
- Suhail, M. Z. (1986). *The palm in cuneiform sources: Arab horizons*, (1st ed., Vol. 24). World of Books.
- Suleiman, A. (1992). *Iraq in ancient history: A brief history of civilization* (vol. 2). Mosul University of Mosul.

- The Buildings Department. (2016). *Code of practice for precast concrete construction. The government of the Hong Kong special administrative region* [online]. <https://www.bd.gov.hk/doc/en/resources/codes-and-references/code-and-design-manuals/cppcc2016e.pdf>
- The Eco. (2022, June 29). Sustainability brings new opportunities for precasters. *Elematic*, (2022). <https://www.elematic.com/learn/media/magazine/>
- Wahhab, M. T. A. (1985). *Sculpture from the era of dynasties to the Neo-Babylonian era, the civilization of Iraq* (vol. 4). University of Baghdad.
- Wang, Y., Chen, S., & Zhang, J. (2017). A life-cycle analysis for both energy and cost of precast concrete building components: A Process-Based Model. In ICCREM 2017. *International Conference on Construction and Real Estate Management 2017. American Society of Civil Engineers*. <https://doi.org/10.1061/9780784481059.010>
- Wilson, E. (1995). *Islamic decorations and drawings*. Dar Al-Qabes for printing and publishing.
- Yohanna, M. K. (1999). *The sculpture of the Assyrian Sargon 721-705 BC*. [Unpublished doctoral dissertation]. University of Baghdad.

