

# Application of Architectural Graphic Design in Art Construction

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**Abstract:** In the design of construction projects, the design of plane geometry is particularly important. The structure should not only follow the firm and reliable nature of the building itself, but also meet the aesthetic requirements of art in form. Therefore, the application research of the art construction in the building plane is put forward. This paper introduces the geometric morphology from the architectural point of view. The color, texture and field shape are analyzed in detail. The results show that the research has important application value.

**Keywords:** Architectural engineering; Geometric graphics; Graphic design; Aesthetics

## 1. Introduction

The basic composition of architectural scheme design begins with the plane. When designing the plane, we should grasp the function of the building, control the relationship between the building and the base environment, and coordinate the relationship between the architectural composition and the function. The first thing to be solved in building plane is the need of human activities, in addition to meeting the physical indicators such as sunshine, ventilation and the rationality of structural technology [1-3]. In the design of architectural plane modelling, the usual method is geometric transformation, that is, to abstract the architectural form into the basic geometric form and transform it into the basic elements of the form-volume, surface, line and point. By using the method of composition, the ideal architectural plane can be formed through the combination of the five elements of shape, color, texture, volume and field shape. Its composition mode can be roughly divided into geometric group mode and space field mode around the center of the building.

**1.1. Basic geometric form, which is the simplest and simplest form in the architectural plane, is logically strong, including triangular form, rectangular form, circular form and so on, such as the circular plane form of Fujian Hakka Tulou**

The basic geometric form is usually surrounded by walls, leaving only small doors and windows for ventilation and ventilation. Generally, there is no access to the outside world, which reflects the basic characteristics of closure and self-contained. The symbolic meaning of this architectural plane form of Fujian Hakka Tulou is internal unity and resistance to foreign nationalities. Repetition is a common form of plane formation, a combination of geometric forms, which belongs to the

regular form of formation. Repetition refers to the repeated arrangement of identical basic shapes in two-dimensional plane. This continuous repetition is reflected in people's vision and produces a sense of order and beauty. Repetition is characterized by rigor and stability. And a strong sense of rhythm. In architectural design, repetitive forms can produce unique space and create a sense of rhythm of architectural forms. Repetition is also an important emphasis, through the repetition of geometry, to enhance people's impression of the main body of architectural form. For example, Alvar Alto's Volkseniska Church in Imatra, Finland, is divided into three spaces of the same shape and size with movable partitions. The three spaces can be used separately or as a whole. The plane of the church looks like an arrow with three feathers on its top. The repeated arrangement of the three spaces emphasizes that The linear order of the arrow pole [4-5].

**1.2. Deformation combination of basic geometric primitives**

Based on the application of various basic geometric primitives, these basic geometric primitives are reconstructed by twisting, rotating and tilting to reflect more abundant platform shapes, such as La Pedrera in Barcelona, Spain, Brasilia in Brazil and the rotating tower in the United Arab Emirates in Dubai. The theme language of the building itself can be expressed by means of eversion and so on. Architectural group refers to the combination of several buildings in the same base environment with similar style or specific functions, or within a certain range. These buildings are interrelated and complementary in function and form. The geometric relationship of each building unit in the building group and the group composition in the plane composition are the same. The group composition is also called group combination. It refers to the use of several identical or

similar basic shapes to form graphics by arrangement and combination. Through this combination of graphics, the architectural design idea is strengthened and people are strongly touched.

### 1.3. Segmentation and reorganization of basic geometric primitives

Using the relationship of gravity, parallelism and staggering of geometric primitives, more expressive and fully functional plane spaces are created, such as Mario Botta's Stabio Round House. On the plane of geometric primitives, a "crack" is set up, and light is introduced into the interior of the building to show the independence of the building. And it won't be disconnected from the surrounding buildings. In plane composition, segmentation is to divide the whole into parts. According to the method of graphic segmentation, segmentation can be divided into isomorphic segmentation, isomorphic segmentation, free segmentation and so on. Their common point is that the segmented unit can reconstitute a whole, and sometimes the unit can be chosen to produce a sense of liveliness and freedom. The geometric division in architectural design is mainly free division, and the division line is often used as a building.

The dividing line of space, either as a atrium to introduce light into the interior, or as a traffic space to arrange. The most important two points in the segmentation technique are the design of the segmentation line and the choice of the segmentation unit. Architecture can produce rich and flexible spatial morphological effects by segmentation. For example, Mario Botta's usual architectural techniques are geometric lines and central symmetry. The Bianda Garden Hall House in Switzerland is a representative work of his architectural design ideas. The whole building is cylindrical, with gray tiles on its exterior facade. The whole house is cut along a crack in the center, with skylights in the crack position of the roof and natural light. Lines lead into the interior of the building through narrow slits, and cracks on the first floor serve as the main entrance to the building. Jean Nouvel designed the building of the Center for Arab World Studies in Paris with a ship-like plane. The building is divided into two parts by a dividing line. The starting point of the dividing line is the VIP entrance. The car can stop on the steps and enter the center directly. The ending point of the dividing line is the central courtyard of the building plane, which is used for lighting and ventilation. The secant's introduction of important entrances into the inner atrium represents the introversion of Arab architecture.

## 2. Conceptual Techniques of Architectural Plane form Design

Architectural plane form design cannot be separated from the satisfaction of functional requirements and the display of artistic form. When conceiving how to design form, it is necessary to conduct in-depth research from various angles to reflect the comprehensiveness and uniqueness of the design. The author's suggestions are as follows.

### 2.1. Integrating functional requirements into morphological design

Architectural graphic design should be a combination of art and practical functions. The most commonly used form design method for architectural graphic designers is to conceive the idea of architectural plane from the perspective of engineering demand of buildings, and integrate functional requirements into form design, so as to avoid manifesting graphic creativity while not fully realizing the functions of architecture, such as Guggenheim Museum in New York, USA. Architect Frank Lloyd Wright breaks the traditional parallel and orthogonal architectural plane form of museums on the basis of combining the demand function of the museum's flow line. With the curved spiral plane form, the exhibits are arranged on the spiral wall, giving a refreshing viewing mode. Frank Lloyd Wright also organically unifies the centripetal and centrifugal nature of the line and surface in the same plane. While forming the spiral ascending plane shape, he shapes the internal function of the spiral exhibition, which naturally integrates the plane shape and function. Many post-modern architectural graphic designers follow the same pattern. Guggenheim Museum has been inspired by the design. It not only shows the artistry of the architectural plane form, but also highlights the practical function more scientifically and rationally with the help of the artistic form.

### 2.2. Integrating traditional symbols into morphological design

The so-called traditional symbols refer to the historical and cultural connotations of the building's location. The traditional symbols are one of the most important elements in the shape design of buildings. On the basis of historical and cultural connotations, the character characteristics of the shape design of buildings will become more and more obvious. The Indian state of Bopal is a case in point. Architect Charles Coria inspects the historical and cultural environment around Bopal and finds that besides natural conditions, it has natural lakes and mountains, and many Muslim buildings, among which Sanchifota is one. Charles Coria got inspiration from it. In the form design of Bhopal State, he extracted the traditional symbolic elements of Mandala patterns of ancient Indian and Islamic cultures, obtained the inspiration of the Nine-palace form of graphic design, took the circle as the basic form of

architectural plane, and then divided the building into halls and courtyards. The House of Commons, the House of Commons, the Library and the General Hall, among which the first two form a cross-shaped plane, the latter four are placed in the corners of the cross-shaped, and three non-intersecting traveling routes are arranged, among which the traditional symbolic artistic charm of Islamic buildings can be appreciated from any angle. Understanding the cosmos and religion of ancient India has contributed to Bopal's status as the most symbolic graphic design in India and even in the world. It is also a rare architectural wonder among Indian and Islamic buildings.

### 3. Gradation

Gradient phenomenon is a common visual feeling in daily life. Street lights on both sides of the street are from far to near, from small to large, and the sun rises from low to high, from small to large. Gradient visual effect has a strong sense of perspective and spatial extension. The Wolfsburg Cultural Center designed by Alvar Alto successfully uses the example of gradual composition, with five approximately rectangular conference rooms and lectures facing the city hall square.

### 4. Conclusions

With the development of economy and the progress of science and technology, people's aesthetic requirements are getting higher and higher, and the requirements for artistic beauty are also gradually increasing. How to highlight beauty and express beauty in the graphic design of architectural engineering has become a hot issue of people's attention. Therefore, it is very

important to explore the key points of visual elements construction in architectural graphic design in detail. Pictures are the most basic aesthetic elements. Graphics are mainly composed of points, lines and surfaces. Construction technology and construction management are strictly monitored and checked. Construction supervision mechanism is established to improve construction technology and construction management. Because the present management of construction is a relatively complex work, this paper, based on the actual construction process of housing construction engineering, analyses and applies the construction technology and construction management concept of housing construction, in order to improve the construction quality level of housing construction engineering.

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