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Research on innovative design of public facilities in Jibo City Site Park

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Abstract

Guided by ancient site culture, carry out the innovative design practices of public facilities in the site park. Starting from the particularity of the site park and the need for regional cultural inheritance, this study investigates the current situation of public facilities in the Jibo City Site Park, discusses the application value and transformation methods of ancient site culture in public facility design, and completes corresponding design practices.As witnesses of historical and cultural heritage, the public facilities of the site park should be based on the site culture, and on the basis of in-depth decomposition of cultural elements, with the help of visual expression, image extraction, symbolic metaphor and other artistic means, achieve a high degree of integration between site culture and design forms, create a facility system that conforms to the special cultural atmosphere of the site park, and enhance the artistic and cultural value of public facilities in the site scenic area,promote and disseminate excellent traditional Chinese culture, and promote the high-quality development and construction of heritage parks.

Keywords

Ancient site culture;Site Park; Public facilities; Innovative design

1. Introduction

Compared to ordinary urban parks, heritage parks also play a special role in protecting and showcasing sites, inheriting cultural heritage, and can be interpreted as a comprehensive combination of site protection and park construction, with "sites" as the core of park planning and design[1], therefore, public facilities located within them should also have certain site characteristics, showcase the unique cultural resources of the site, and become a local cultural window and important business card[2].

The superior geographical conditions have enabled our ancestors to create a brilliant civilization on this land of Zhengzhou, leaving behind a large number of historical relics[3].As an important birthplace of Chinese civilization and one of the eight ancient capitals of China, Zhengzhou's urban image is fragmented, lacking discourse power and influence[4]. People's impression of Zhengzhou's weak impression of historical features is completely unequal to its rich historical and cultural resources. Dozens of large and small archaeological parks located in Zhengzhou City have not improved the cultural image of Zhengzhou's ancient capital. Faced with these high aesthetic archaeological parks,Citizens express that they cannot understand[5].For example, the Ecological and Cultural Park of the Jibo City Site and the National Archaeological Site Park of the Zheng Han Ancient City, has almost identical public facilities without any distinctive features, covering

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up the profound historical and cultural information behind the site park and directly hindering the public's reading of the cultural connotations of the site park. How to showcase the special cultural value contained in the site park to the public and make them understand the site culture is currently a difficult point in the construction of the site park, and it is also a focus of attention. The public facilities system of the site park can play an important role in spreading and promoting the site culture.

Taking the Jibo City Site Ecological and Cultural Park as an example, this study explores the current construction status of public facilities in the park, conducts research and design practices on the integration of ancient site culture and public facilities, in order to achieve the revitalization design of site culture in public facilities, and enable the design of public facilities in the site scenic area to better return to cultural orientation, shape spatial characteristics, disseminate site culture, and enhance the cultural characteristics of the site space.

2. The current situation of public facilities construction in the Jibo City Site Park

The Jibo City Ruins Ecological and Cultural Park, abbreviated as the Jibo City Site Park, is located in the northeast of the CBD Business District in Zhengdong New District, Zhengzhou City, Henan Province. It has convenient transportation and a total area of 28800 square meters, including 17000 square meters of green space. It is a place that integrates green space construction and site protection.The base has a relatively small area, with three main urban roads on three sides and one adjacent to residential areas. The entire base is in a form of east-west long and north-south narrow. The vertical height difference is used within the base to create multiple spaces with different heights, combined with green space, a good green environment is formed, providing citizens with a public activity space for sightseeing, visiting, and rest. There are not many types of public facilities supporting the park, mainly including street lights, seats, signs, trash cans, etc, and there are few signs and information indicating facilities. There is only a large scenic stone at the entrance of the park, which is engraved with the name of the park and the origin of the site.

The public facilities in the park have no distinctive features, just like the public facilities in ordinary parks and streets in the city. The simple design, ordinary materials and colors only meet the practical functions of the facilities. The form is too simple, the shape is not prominent enough, the colors are not infectious, and the artistic beauty of the design is lacking, as shown in Figure 1.The modern rather than ancient facilities in the park neglect the expression of the cultural connotations and spirit of the site, which is highly mismatched with the historical and cultural value of the Jibo City Site.



Figure 1 Current situation of public facilities in Zhabocheng heritage park

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3. The Application and Transformation of Ancient Site Culture in the Design of Public Facilities in Site Parks

3.1 The Application Value of Ancient Site Culture in Public Facility Design

Ancient site culture refers to the collection of various cultural forms gradually formed by predecessors in the historical changes of ancient times. It is rich in types, covers a wide range, has strong historical significance, and has high research value. It provides rich design materials and inspiration for the public facilities design of contemporary site parks. For example, the signage in the main entrance space of the Erlitou National Archaeological Site Park, relying on the abstraction, deformation, and citation of the bronze statue of the unearthed cultural relic from the Erlitou site, has created a unique signage with the characteristics of the summer capital. When people see it, they can immediately associate it with the culture of the summer capital site. The design of public facilities that integrate ancient site culture not only enriches the styling features of public facilities, but also enhances the cultural connotation of public facilities, making the image of public facilities more qualitative and emotional, displaying unique cultural attributes, highlighting the historical and cultural characteristics of the site, and playing an important role in the image promotion and quality improvement of the site park, as well as the promotion of site culture.

3.2 Genetic Decoding of Ancient Site Culture

"Cultural genes" are derived from the concept of "genes" in the inheritance of biological traits, and their connotation is the genetic units that have stability, local representativeness, and broad consensus in urban cultural inheritance[6].At present, there are three main forms of methods in academia for decoding cultural genes. The first is to classify and decode a certain culture's genes from two levels: material cultural genes and spiritual cultural genes. The second approach is to analogize cultural genes with biological genes, dividing cultural genes into main genes, attachment genes, mixed genes, and variant genes. The third approach is based on a deep analysis of cultural genes from the perspective of biological genetic genes. Li Yanan and Wu Fuping named it after the four base "T-A-P-C" decoding method of cultural gene DNA proposed in their book "Principles and Methods of Cultural Gene Decoding". They established the "S-K-chain" double stranded model to decode cultural genes in Zhejiang culture and combined its results with cultural and tourism research.This theory is unique and innovative, with a certain degree of scientificity, and is currently the most profound and difficult analytical method for cultural gene decoding engineering.

International conventions and China's Cultural Relics Law have defined the value of archaeological sites in three ways: historical value, scientific value, and artistic value. With the deepening of research on related topics of archaeological sites, many scholars have subsequently proposed the "social and cultural value" of archaeological sites, which has been widely recognized and serves as the basis for scholars' research [7].

In summary, genetic decoding research on ancient site culture will follow the principle of "historical genes scientific genes artistic genes social and cultural genes" DNA four base.

3.3 Application methods of ancient site culture in public facility design

(1) Intuitive representation method

In public facility design, the most commonly used cultural expression method by designers is the intuitive

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expression method, which is to visually display specific physical objects based on the cultural information they want to convey. This method gives people a clear feeling at a glance, belongs to physical reproduction, and is the easiest for people to read information and understand the meaning. There are many ways to express things intuitively, such as sculptures, building objects, stone carvings, and various restored objects. The cultural landscape facilities in the Yuan Dadu Ruins Park located in Beijing adopt a visual expression method. In the Dadu Jiandian Scenic Area, group sculptures are used to restore the classic scene of Emperor Yuan entering the city, allowing visitors to intuitively experience the prosperity and prosperity of the Mongolian people during Genghis Khan's reign [8].

(2) Image extraction method

Image extraction method is different from physical display. It is the extraction of image elements by designers after analyzing the characteristics of the physical object. Perhaps the colors, patterns, contours, structures, and other parts of the original physical object are extracted, and finally combined with a certain formal language for design presentation. The design inspiration for the shape of an information board located not far from the south entrance of the Sui and Tang City Botanical Garden is derived from the official hats of the Sui Dynasty. In ancient official hats, the Sui Dynasty official hats had prominent features, with hairpins resembling two ears and a bold and exaggerated design. The upper part of the information board is an abstract expression of the image of the Sui Dynasty official hat.

(3) Symbolic Metaphor Method

Symbolic technique refers to the designer's use of a specific image to imply a specific character story, historical event, or certain spirit, so that tourists can have certain associations after seeing it, which can be associated with the content related to the object, thereby triggering resonance. Metaphor refers to the emotional communication between designers and tourists, which is achieved by allowing tourists to have a consistent telepathy after appreciation based on a certain metaphorical relationship between things[9].

The garden gate of Sui Tang City Relics Botanical Garden adopts the method of symbolic metaphor. On both sides of the north gate entrance are two platforms up to ten meters high, on which there are two layers of sharp pavilions. From the overall design of the roof, you can clearly see the arch of wooden architecture and exquisite roof truss structure in the wooden buildings of the Tang Dynasty. The tall size and exquisite structure of the entire building platform show the brilliance and splendor of the buildings of the Tang Dynasty. The western gate is designed using a combination of ancient city wall ruins and the silhouette of the Temple of Heaven's Prayer Hall, fully showcasing the solemn and plain shape of classical architecture, implying the majestic momentum of the Sui and Tang city ruins.

4. Analysis of the Culture of the Ancient Site of Ji Bo City

The Jibo City Site dates back more than 3000 years and contains rich historical information. Its protection and development have extraordinary significance for the study of urban historical context and modern humanistic education[10].Jibo City was first established as a vassal state after the establishment of the Western Zhou Dynasty, and its existence and abolition dates back to the early Spring and Autumn period[11].Therefore, the analysis of the culture of the ancient site of Jibo City is positioned in the Western Zhou period when it was founded.

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The system of ritual and music, as well as the education of the six arts introduced during the Western Zhou Dynasty, pioneered ancient Chinese civilization. Its bronze art and calligraphy on bronze inscriptions achieved the glory of ancient art, and the idea of "matching virtue with heaven" advocated by society at that time was also a progress in civilization. As a result, the Chinese nation truly entered the era of civilization. Following the principle of decoding DNA four bases of ancient site culture genes, the genetic decoding of this ancient site culture will be carried out and become a source of inspiration for subsequent public facility design, as shown in Table 1.

Table 1 Decoding and Application Analysis of Cultural Genes at the Jibo City Ancient Site

type	concrete content	feature	Application analysis
history gene	Zhou Gongdan	The Chief Designer of Zhou Dynasty Civilization	Character image, historical allusions, achievements
	Sacrifice to the public and seek the father	"Ji Bo", a scholar of the royal court, a meritorious minister	Character image, historical events, achievements
	Sacrifice to Zhong	Outstanding figures and great achievements in Jibo City	Character image, historical allusions, achievements
science gene	Six Arts Education	Propose an educational philosophy centered on etiquette	Theme image extraction
	cultivation culture	Establishing a humanistic philosophy of "matching virtue with nature"	Connotation mining and abstract expression
Art gene	Bronze craftsmanship	The flourishing period of bronze sculpture and art	Bronze ware modeling, pattern decoration, and color extraction
	Ceramic craftsmanship	Adding simple rope patterns, loops, etc. to the plain surface	Shape and pattern extraction
	Textile technology	There is professional division of labor and dyeing process in terms of craftsmanship	Twelve Chapter Pattern Line Extraction
	Lacquerware craftsmanship	A small amount of brightly colored paint application	Shape features and color application
	Jade carving craftsmanship	Admiring jade, with beautiful texture and improved skills	Pattern extraction
society culture gene	Fenfeng Jianguo	Consolidate dynasty rule and gather people's hearts	Connotation mining
	Grading	Divide social hierarchy and hierarchy	Connotation mining
	Praising ritual and music	Putting propriety first and seeking harmony through music	The Shape and Line Art of Musical Instruments
	Food culture	Containing the concept of hierarchy, respect, and health preservation	Expressions of cooking utensils, wine vessels, etiquette, etc
	Jinwen Calligraphy	The unique style is conducive to the creation of clerical script	The Aesthetic Art of Jinwen Calligraphy

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5. Application of Ancient Site Cultures in Innovative Design of Public Facilities in Jibo City Site Park

5.1 Information facilities

The etiquette and customs of society constitute the historical genes of an era, and this always lacks the participation of great historical figures, who often become the best promoters and witnesses of history. Jibo City was the fiefdom of the fifth son of Zhou Gongdan during the Western Zhou Dynasty, with many talented people and remarkable achievements. Several generations of rulers became the chief minister of the Zhou King, among which the most famous and controversial figure was the descendant of Jiguo, Jizhong. He assisted five rulers successively, and the historical idioms "difficult to plot" and "many unjust deeds will lead to self death" are all related to him. During the Yongle period of the Ming Dynasty, the famous scholar Feng Zhen wrote a poem called "Sacrifice to the City of Bo", recalling the history of the Western Zhou Dynasty's enfeoffment and city construction, and singing about the historical figure Ji Zhong.

Based on this, in the innovative design of information facilities, the traditional form of text dissemination through bamboo slips is used to visually express the poem "Ji Bo Cheng", and the poetry is engraved on the bamboo slips.In order to facilitate people's intuitive understanding of the basic situation of the site, the map of the ancient city site is also presented in an intuitive way in the upper left corner of the information board. To strengthen the feature of the ancient city site, the bottom of the information board uses the image extraction method to abstract the image of the city wall as the bottom decoration.To emphasize the integration of ancient and modern facilities, in line with modern people's electronic reading habits, the shape of animal bones has been appropriately transformed, combined with electronic touch screen intelligent terminals, and an intelligent park guidance system has been set up. Tourists can not only experience the knowledge and fun brought by oracle bone games through the electronic touch screen, but also click to obtain historical information and cultural knowledge of the park, as shown in Figure 2.

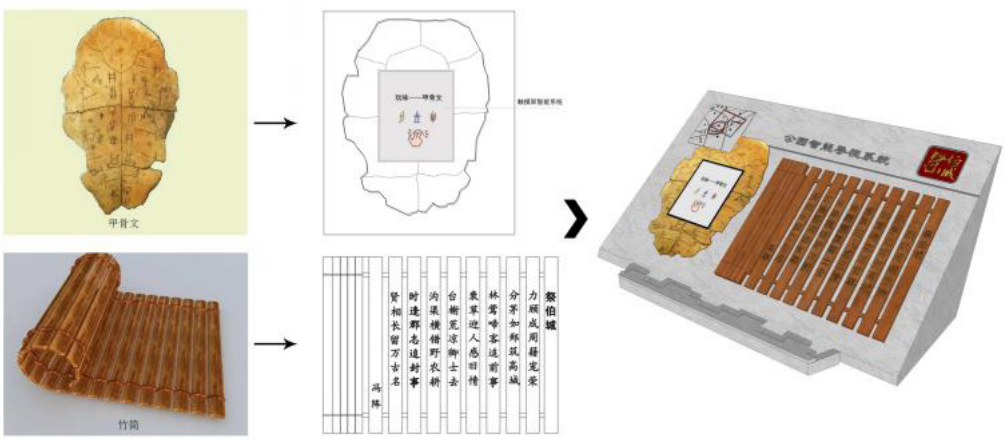


Figure 2 Innovative design of information board

5.2 Rest facilities

The Western Zhou period was a prosperous period for the production and use of bronze ware in China. The natural radiance and color of bronze ware emitted a cultural atmosphere from the initial period of civilization.

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Its magnificent and smooth patterns also revealed the beauty and mystery of art.In the innovative design of rest facilities and chairs, the image extraction method was used to extract typical phoenix and kui dragon patterns from the patterns of Western Zhou bronze vessels. The patterns were abstracted, simplified, and transformed, and presented explicitly. They were decorated on both sides of the chairs in the form of relief bronze iron plates, highlighting the bronze art prevalent during the Western Zhou period and catering to the auspicious meaning of dragon and phoenix in modern times, as shown in Figure 3.

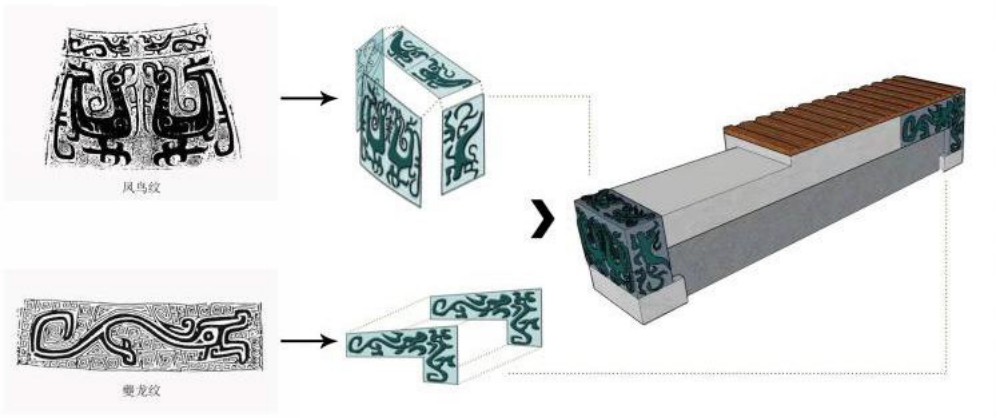


Figure 3 Innovative design of bench

5.3 Lighting facilities

The design of public facilities often draws inspiration from the unique historical relics and cultural elements of the city[12].The innovative design of street lamps draws inspiration from the artistic and socio-cultural genes of the Western Zhou ancient site culture, and uses image extraction and symbolic metaphor methods for artistic expression.Starting from the cultural layer behind the source site, explore its cultural genes.

The ritual and music system created by the Western Zhou Dynasty was an important social and cultural phenomenon at that time, and also the first exploration of ritual civilization by humans. It had a significant impact on the development of later civilization and social systems.Li refers to the status and relationship between monarchs, subjects, fathers and sons, couples, etc., while Le refers to dance music that is carried out in conjunction with various ceremonial activities. The Li and Yue system stipulates that nobles of each level can only use instruments that match their level. Based on the design requirements of street lamps, musical instruments such as bells and wine vessels are selected for abstract extraction and application of object shapes in the design.

The bottom shape of the street lamp is derived from the musical instrument chime, which extracts the shape and decoration of the chime, and combines it with stone and bronze iron decorations to express the modern style of the chime.The design inspiration for the upper end of the high street lamp comes from the Gu, which was a popular wine vessel during the Western Zhou Dynasty and a necessary ceremonial tool for aristocratic funerals. Its overall length and beautiful shape meet the lighting function and styling needs of the lamp. In addition, its port is wide on the top and narrow on the bottom, forming a clear trumpet shape, which can evoke the support state held by ancient people in worshiping the heavens. It implies that the Zhou people used virtue to match the heavens and respect the agricultural culture of the Heavenly Way. By combining image extraction and symbolic metaphor, the dual significance of this shape is achieved.The column in the mid-

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dle of the high road lamp is an abstract expression of the Zhou Dynasty ritual and music, as shown in Figure 4.

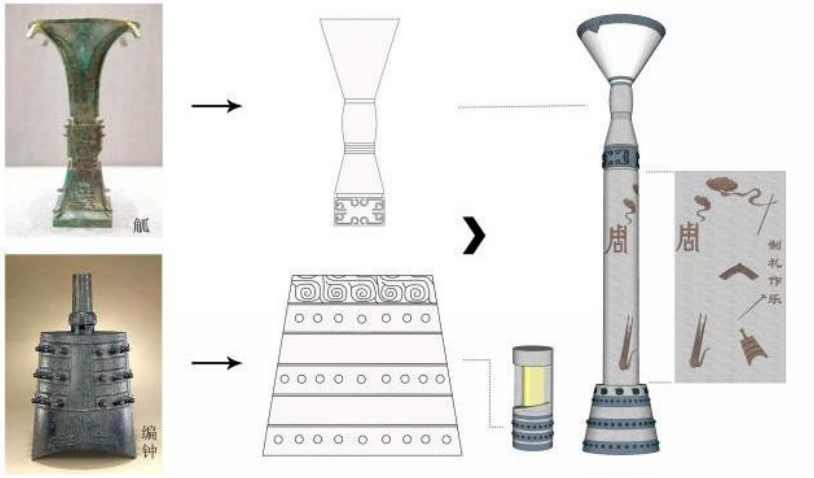


Figure 4 Innovative design of street lamp

5.4 Transportation facilities

The Western Zhou Dynasty created the "Six Arts" education under the name of "ritual, music, archery, imperial, calligraphy, and mathematics", which respectively referred to etiquette education, dance and music art education, archery, driving carriages, literacy and reading, and calculation. It included cultural knowledge, moral development, and physical exercise, and was the wisdom crystallization of ancient Chinese civilization, opening the way for ancient humanistic education. It still has an important impact on education in later generations and even today.

To enhance the cultural atmosphere of the Jibo City Site Park, distinctive relief bricks are used in transportation facilities to showcase cultural connotations.The Han Dynasty wall bricks once expressed the Six Arts culture in a concise visual form. Based on this, the design re extracted the image symbols of the Six Arts culture elements to meet the modeling needs of relief bricks. At the same time, the popular stealing and curling patterns of the Zhou Dynasty were used as decorations in the center of relief bricks, which not only unified the picture but also reflected the cultural elements of the Zhou Dynasty. The edges of relief bricks used relatively simple curling patterns, which were consistent with the curling patterns on street lamps, Strive to ensure coordination between the entire set of public facilities, as shown in Figure 5.The above four types of public facilities can be combined with the site display area in the park to enhance the strong cultural atmosphere of the Zhou Dynasty site at the Jibo City site, as shown in Figure 6.

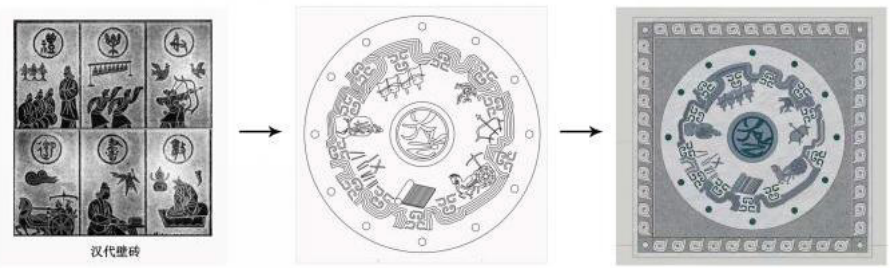


Figure 5 Innovative design of relief brick

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Figure 6 Public facilities scene show

6. Conclusion

As a public facility design for a heritage park, it should not be a low-quality development or mass design of a thousand gardens, but should become a material carrier that reflects ancient heritage culture and conveys the spirit of the site, showcasing the unique charm of the regional heritage culture, and becoming a highlight of high-quality construction for heritage parks.The design of public facilities in heritage parks should achieve a penetration and balance between modern aesthetics and ancient culture, dissecting and decomposing the profound heritage culture through genetic dissection and cultural decomposition. Through artistic means such as intuitive expression, image extraction, and symbolic metaphor, the modern translation of heritage culture in public facility design should be achieved, achieving a perfect integration of modern cities and historical relics,Create an unforgettable experience of "people traveling in the city, lifting their eyes to see the ancient city"[13].

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