MINISTRY OF CULTURE OF UKRAINE

KHARKIV STATE ACADEMY OF DESIGN AND ARTS

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APPROACHES TO FORMING THE DESIGN OF INDUSTRIAL HERITAGE RENOVATION OBJECTS

(USING THE EXAMPLE OF THE PRC)

Qualification work for obtaining the SVO «Master»
in the specialty B2 Design OPP «Design of the architectural and landscape environment»

The qualification work contains the results of own research
The use of ideas, results and texts of other authors must be referenced to the appropriate source. _____ Jia Yu (Raina)

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Kharkiv-2025

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ANNOTATION

Jia Yu (Raina). Approaches to the formation of the design of industrial heritage renovation objects (on the example of the PRC).

The qualification work is devoted to the study of the current problem of the design of industrial heritage renovation objects, which directly affects the psycho-emotional and physical state of a person in any age category. The work reveals the issues of high-quality organization of therapeutic space based on the urban theory of urban acupuncture.

The analysis of the source base on the topic shows that all the studies not only enrich the theoretical subtext of the theory of urban acupuncture in the design of urban and interior space reconstruction, but also provide valuable recommendations for the practical work of specialists. The main concept is based on the dual urban renewal approach and is consistent with the approach to the design of the renovation object - the Fengyangmen Taiji Tobacco Factory, as well as in the ecological approach to urban renewal aimed at combating urban brownfields, improving the living environment, and transforming and updating the development methods of Chinese cities.

Through the renovation, the tobacco factory can be modernized while maintaining its unique cultural charm, thereby enhancing the cultural identity of local residents.

The object of the study is the design of renovation objects.

The subject of the study is approaches to the formation of design in renovation objects. The structure of the work consists of an introduction, two chapters, conclusions, a list of sources used and appendices.

The introduction defines the relevance of the study, formulates the purpose and objectives of the study, and outlines the object and subject of the study, the

methods used, the scientific novelty of the work, and the theoretical and practical significance of the work.

The first section analyzes the source base on the topic of the study and modern practical studies that describe the issues from the perspective of compliance with the urban theory of acupuncture of the city. Based on the synthesis of the results of the analysis of these sources, the main groups of approaches to the formation of the design of urban and interior spaces are formed.

The second section provides a concept for solving one's own design proposal, characterizes each of the groups of approaches related to solving the interior design of the Fengyangmen Taiji tobacco factory.

The conclusions indicate that this topic contains all the necessary components for the further implementation of the results of the qualification work into design practice based on the following approaches: spatial optimization, ecosystem restoration and cultural integration. The significance of the study reveals the following results of the task: 1) stimulating the viability of the industrial zone, its economic development; 2) activating and supporting regional culture, achieving organic coexistence of historical memory and modern life of local residents; 3) reveals the need to use the functional feasibility method when forming one's own interior design proposal.

Keywords: design, industrial heritage, functional feasibility method, renovation object, restoration, cultural integration.

АНОТАЦІЯ

Jia Yu (Raina). Підходи до формування дизайну об’єктів реновації промислової спадщини (на прикладі КНР).

Кваліфікаційна робота присвячена вивченню актуальної проблеми дизайну об’єктів реновації промислової спадщини, що безпосередньо впливає на психоемоційний та фізичний стани людини в будь-якій віковій категорії. В роботі розкриваються питання якісної організації терапевтичного простору на основі урбаністичної теорії акупунктури міста.

Аналіз джерельної бази за темою показує, що усі дослідження не лише збагачують теоретичний підтекст теорії міської акупунктури в проєктуванні реконструкції міського та інтер’єрного просторів, але й надають цінні рекомендації для практичної роботи спеціалістів. Основна концепція базується на основі *підходу подвійного відновлення міст* та узгоджується з *підходом до проєктування реконструкції* тютюнової фабрики Фен'янмень Тайцзи, а також у *екологічному підході* до відновлення міст, спрямованому на боротьбу з міськими занедбаними територіями, покращення середовища проживання та трансформацію й оновлення методів розвитку міст Китаю.

Завдяки ремонту тютюнова фабрика може модернізуватися, зберігаючи при цьому свій унікальний культурний шарм, тим самим підвищуючи культурну ідентичність приналежності місцевих жителів.

***Об’єктом* дослідження** є дизайн об’єктів реновації.

***Предметом* дослідження** є підходи до формування дизайну в об’єктах реновації.

Структура роботи складається зі вступу, двох розділів, висновків, списку використаних джерел і додатків.

У ***вступі*** визначено актуальність дослідження, сформульовано мету та завдання дослідження, а також окреслено об’єкт і предмет дослідження, методи, що були використані, наукову новизну роботи, теоретичне та практичне значення роботи.

У ***першому розділі*** здійснено аналіз джерельної бази за темою дослідження та сучасних практичних досліджень, що описують проблематику зі сторін відповідності до реновації об’єктів промислової спадщини. На основі синтезу результатів аналізу даних джерел сформовано основні групи підходів формування дизайну міського та інтер’єрного просторів.

У ***другому розділі*** надано концепцію до вирішення власної проєктної пропозиції, охарактеризовано кожну з груп підходів, що стосуються вирішення дизайну інтер’єрного простору тютюнової фабрики Фен'янмень Тайцзи.

У *висновках* зазначено, що дана тема містить усі необхідні складові для подальшого впровадження результатів кваліфікаційної роботи у дизайнерську практику на основі наступних підходів: *просторової оптимізації, відновлення екосистеми та культурної інтеграції*. Значення дослідження розкриває наступні результати завдання: 1) стимулювання життєздатності промислової зони, її економічного розвитку; 2) активізацію та підтримку регіональної культури, досягаючи органічного співіснування історичної пам'яті та сучасного життя місцевих жителів; 3) розкрито необхідність використання *методу функціональної доцільності* при формуванні власної дизайнерської пропозиції інтер’єрів.

Ключові слова: дизайн, промислова спадщина, метод фуункціональної доцільності, об’єкт реновації, відновлення, культурна інтеграція.

INTRODUCTION

Relevance of the study:

- The relevance of urban acupuncture and moxibustion theory and the reconstruction design of Anhui Fengyang Mentaizi Tobacco Factory is reflected in the precise fit of "key nodes". Urban acupuncture and moxibustion emphasizes to take potential small-scale nodes in the city as the starting point, and activate the vitality of surrounding areas through targeted intervention. As a historical relic bearing Fengyang's industrial memory and unique architectural texture, Mentaizi Tobacco Factory is the "key point" in urban space. Its idle state not only causes waste of resources, but also makes the surrounding area lose the connection point between culture and function. Guided by the urban acupuncture and moxibustion theory, transforming it into the exhibition hall of Ming culture (focusing on the calligraphy of the Ming Dynasty and the four paintings of the Ming Dynasty) is just the precise acupuncture and moxibustion of this "acupoint": Fengyang, as the capital of the Ming Dynasty, is the core cultural gene of the city, and the positioning of the exhibition hall not only fills the gap of the centralized display of local Ming culture, but also takes cultural functions as the entry point, so that the idle factory buildings can be transformed into the carrier of inheriting the core cultural context of the city. Through the reconstruction of the function of a single node, it can drive the improvement of the cultural atmosphere of the surrounding area and the optimization of public space, fully matching the "point by point" of urban acupuncture and moxibustion face ".

- The two are highly unified in the goal of "cultural inheritance and regional synergy". The core value of urban acupuncture and moxibustion is not only the restoration of spatial functions, but also the activation of nodes to awaken the historical memory and cultural identity of the city and promote the synergy between nodes and the surrounding environment. Using the Ming Culture Exhibition Hall as a carrier, accurately implant the most core Ming culture elements of the city. The calligraphy works of the Ming Dynasty and the paintings

of the four Ming schools are the core representatives of the cultural and artistic achievements of the Ming Dynasty, and Fengyang, as the birthplace of the Ming Dynasty, has a natural geographical and historical rationality in displaying such cultural resources. Through the transformation, the idle factory buildings became the "cultural acupoint" of the Ming culture transmission, which not only allowed the precious artistic heritage to go out of the warehouse and close to the public, but also strengthened the urban cultural identity of Fengyang as "the capital of the Ming Dynasty", which was highly unified with the deep connotation of the urban acupuncture and moxibustion theory of "awakening urban cultural identity through node activation".

Research objective:

- to achieve the goal of promoting Anhui regional culture through design practice;

- to propose new functions in renovation facilities taking into account modern trends in environmental design;

- to promote environmental awareness through the implementation of design tools that meet the sustainable development strategy.

The object of the research is the design of interior space in renovation facilities.

The subject of the research is the approaches to forming the design of interior space in renovation facilities.

Research objectives:

1) Basic theoretical research:

- to collect successful examples of design practice both domestically and abroad, regarding the design of urban and interior spaces in accordance with the urban

acupuncture theory of the city, including the improvement of environmental awareness and the dissemination of cultural heritage, etc.;

- to analyze their design strategies, implementation processes and effect evaluation, providing references to design examples;

- Refine the design methods of the renovation site, including the optimization of spatial planning and the integration of cultural characteristics, etc.

2) *Design practice research:*

- through methods such as photography, site visits and research, we will conduct a factual study of the current situation in the Anhui Fengyang area, understand its historical evolution, geographical location, construction quality, auxiliary facilities, land character and other basic conditions, and obtain first-hand information;

- conduct a more in-depth analysis of the Anhui Fengyang area, comprehensively evaluate the building structure, environmental conditions, functional planning and other aspects of the factory site, and identify the difficulties and key points of renovation;

- based on the questionnaire and survey method, study the needs, preferences, behaviors and other aspects of potential user groups, and provide a basis for functional planning;

- formulate specific renovation strategies, including the following: functional transformation, optimization of spatial planning, ecological design, etc.;

- we will develop detailed design plans with the subsequent provision of our own design proposal for the internal space of the factory.

The scientific novelty of the study lies in the fact that for the first time:

- the main groups of approaches corresponding to the urban theory of urban acupuncture have been systematized;

- problematic issues regarding an object that requires renovation and slow renewal of spaces have been analyzed using various criteria;

- design ideas, reconstruction strategies, technical details and the expected social and cultural impact have been analyzed, which provide a meaningful theoretical basis for understanding modern concepts underlying the design of our own design proposal.

Research methods. The following methods were used to carry out the scientific work:

- *analysis* (various sources regarding the formation of urban space taking into account the urban theory of urban acupuncture);

- *synthesis* (isolation of the main groups of approaches responsible for creating an updated environment); - comparison (comparison of the needs of different groups of users of this space);

- *abstraction* (formation of conclusions and recommendations regarding the design of the interior exhibition space); - graphic-analytical (creation of tables and diagrams);

- *experiment* (using the obtained research results in the formation of one's own project concept and their further implementation in the development of a design proposal).

Theoretical significance. This work intends to conduct an interdisciplinary cross-study between the design of urban neighborhood reconstruction and traditional Chinese culture. The theory of urban acupuncture offers a new perspective and approach to the renovation of districts, emphasizing holistic thinking and careful management of the city. By studying and applying this theory, one can further enrich and improve the theoretical system of urban planning. Moreover, traditional concepts of urban design often focus on large-scale and rapid reconstruction methods, while the theory of urban acupuncture advocates small-

scale and gradual approaches to reconstruction. This innovative concept helps to direct urban design in a more humanized and sustainable direction.

The practical significance of the urban theory of urban acupuncture. By accurately identifying key nodes or zones within a given district, the theory can guide the transformation of the entire district step by step. This approach can greatly improve the efficiency and effectiveness of district reconstruction, allowing it to maintain its original charm while rejuvenating it with new vitality. In addition, the ultimate goal of district reconstruction is to improve the quality of life and happiness of residents. The theory of urban acupuncture emphasizes a people-centered concept of reconstruction, focusing on meeting the real needs and expectations of residents. Through the design of reconstruction, it can improve the environment, facilities and services of the district, providing residents with a more comfortable, convenient and safe living space.

Practical significance of the project proposal and presentation of practical results. This project advocates that, based on preserving the original cultural traditions of the city, micro-transformation should be carried out, while fully respecting the historical and cultural background of the quarter. This not only preserves the original appearance and characteristics of the quarter, but also can improve the overall quality and attractiveness of the quarter through detailed processing and integration of cultural elements in the design of the proposed interior spaces.

The practical results of this project will be comprehensively presented in the form of a detailed and complete set of design visualizations. The design visualizations will cover all aspects of the interior space. Every detail will be designed and drawn to accurately convey the design concept and spatial impression. The drawings will also include various types such as sections, floor plans, facades and 3D visualizations, presenting the updated appearance of the interior space design from different perspectives and angles. Meanwhile, the thesis will deeply analyze the design ideas, reconstruction strategies, technical details,

and expected social and cultural impact, providing a rich theoretical foundation for understanding the concepts underlying the design. Thanks to this complete set of design visualizations and a meaningful explanatory note, the achievements and practical value of the qualification work will be fully reflected.

The structure of the work consists of an introduction, two chapters, conclusions, a list of sources used, and appendices.

CHAPTER I. STATUS OF RESEARCH ON THE TOPIC

• Analysis of theoretical research in China.

The application of urban acupuncture theory of the city in the design of neighborhood reconstruction is of great significance. Through the methods of gradual renewal on a small scale, the improvement of the material environment to restore social space, the continuation and preservation of the historical context of the neighborhood, the flexible application of diverse and multi-dimensional three-dimensional landscaping methods, and the improvement of paving and street furniture on both sides of the street, we can jointly promote the vitality and comprehensive revitalization of the neighborhood.

1.1. Research on urban acupuncture theory of the city in the early stages of urban construction. A group of new urban areas developed rapidly to meet the needs of the economic and industrial development of the PRC. Initially, old urban areas were often surrounded by them, until various urban problems arose and large-scale one-time urban renewal took place, which caused varying degrees of damage to the city's cultural heritage. Later, Chinese urban planning scholars also began to explore the methods of small-scale gradual renewal. Although they were not as early as foreign studies, they showed many ways to solve the problems caused by urban "large-scale demolition and construction".

The most classic theory of "organic renewal" proposed by Mr. Wu Lianyung[68] is one of the most representative achievements. Therefore, on this basis, a large number of practical studies on the concept of urban acupuncture have emerged in China.

Design and architectural practice show that the concept of urban acupuncture after the unification of China and the West is obviously more suitable for China's national conditions. The theory of urban acupuncture has made significant progress in the direction of old city reconstruction, overall urban design, and the renovation and protection of historical districts. In China, there are fewer individual studies on the theory of urban acupuncture, but more comprehensive research and

development of multiple theories, and theoretical characteristics and application characteristics of various theories combined with urban acupuncture and cauterization have been proposed.

For example, Yang Jimei[71] (2008) combined urban acupuncture with the concept of urban catalysis. Analyzing the application characteristics of urban acupuncture, she believed that urban acupuncture and the rescue of cauterization points can achieve the regeneration of urban culture in the form of a catalyst.

Xu Xiaoxi[70] (2016) studied the guiding role and influence of the small-scale progressive renovation strategy on the adaptive tourism renovation of characteristic small cities, and analyzed the similarities and differences between "urban renovation" and the theory of urban acupuncture and cauterization.

Yu Ying[75] (2002) studied the influence and significance of structuralism on urban planning by researching and analyzing the theory and methods of urban structure, and proposed a specific work model of urban acupuncture and cauterization based on this concept.

Chu Dongzhu[17] (2011), relying on the concept of “architecture and transportation integration” combined with the concept of “acupuncture and cauterization”, proposed a “cauterization strategy” for high-complexity transportation problems.

Bai Xueyan[3] and Tong Ming[3] (2020) summarized practical examples of urban micro-renovation from the perspective of urban acupuncture theory, and obtained the characteristics of renovation and the main strategies of the urban theory of urban acupuncture combined with micro-renovation.

Li Hongxu[45] (2021) attempted to implement the theory of urban acupuncture and cauterization into the fine management of communities and introduced the concept of progressive intervention into the ideas and strategies of spatial fine management in practice.

Sun Qian[61] et al. (2010), analyzing the case of public space renovation, found that acupuncture and cauterization as an “urban catalyst” can not only control the scale of renovation, but also stimulate the development of surrounding areas and promote the overall improvement of the area.

Zheng Yan[79] et al. (2019) expected to realize the localization of sustainable urban construction by combining urban acupuncture and cauterization, urban regeneration and other theoretical methods.

1.2. Research on the design of neighborhood renovation. Research on the design of neighborhood renovation in China presents a diverse and profound characteristic. Academician Wu Liangyong[68] deeply explores the complexity of old city renovation and the importance of cultural heritage protection in his book "Beijing Old City and Juer Hutong". He points out that neighborhood renovation should not only focus on the renovation of material space, but also pay attention to inheriting the historical context and promoting community vitality.

Meanwhile, Professor Wang Jianguo[64] analyzed the issues of spatial form, functional planning and traffic organization during neighborhood renovation with numerous examples in his book "Urban Design", emphasizing that design should be people-oriented and focused on improving the quality of life and happiness of residents.

In addition, Professor Li Dehua[44] also pointed out in the "Principles of Urban Planning" that neighborhood reconstruction should comprehensively consider various factors such as: economy, society and environment, so as to achieve the maximization of comprehensive benefits. The research of these scholars not only provides us with a rich theoretical foundation, but also demonstrates the practical wisdom of neighborhood reconstruction design through practical examples, providing valuable references and inspiration for future neighborhood reconstruction projects. In addition, there are some studies focusing on the application of intelligence in neighborhood reconstruction.

For example, in the case of creating a "beautiful neighborhood" in a high-tech zone, the application of intelligent artificial intelligence technology has brought revolutionary changes to neighborhood management. Through the introduction of domestically produced artificial intelligence computing power, video analysis, event warning and other functions have been achieved, which effectively improved the management capabilities and service quality of the neighborhood. This intelligent transformation not only improves the safety and convenience of the district, but also provides residents with a more comfortable and convenient living environment. Creating a "beautiful district" in the high-tech zone, the application of intelligent artificial intelligence technology has brought revolutionary changes to district management. Through the introduction of domestically produced artificial intelligence computing power, video analysis, event warning and other functions have been achieved, which effectively improves the management capabilities and service quality of the district. This intelligent transformation not only improves the safety and convenience of the district, but also provides residents with a more comfortable and convenient living environment.

Zhang Aiqin[76] and Chen Jinquan[76] introduced the concept of “urban acupuncture” in the article “Renovation of historical and cultural districts based on the concept of “urban acupuncture” – a case study of Yaoyaqian historical and cultural district in the ancient city of Ganzhou”. Taking the Yaoyaqian historical and cultural district in the ancient city of Ganzhou as an example, they explored the renovation strategy from three aspects: “unblocking meridians and regulating qi”, “selecting acupuncture points, activating blood circulation and eliminating blood stasis”, and “harmony between yin and yang and introducing industrial power”, providing a new path for the renovation of historical and cultural districts.

In the article “Analysis of the Renovation Strategies of Old Buildings in Historic Districts Based on the Concept of “Urban Acupuncture”, Bao Yueming[4], Qiao Yidi[4] and Qi Jijun[4] proposed relevant innovative strategies to resolve the

contradictions between old historic districts and urban planning. The research results show that functional reconfiguration, cultural formation and spatial adjustment can not only inherit the historic district buildings, but also accurately propose new ideas for shaping the image of the city.

In the article “Reflections on Protection and Renovation” and “Historic Districts from the Perspective of Urban Acupuncture”, Chu Haifeng[18], Ding Zhaolong[18] and Liu Yajun[18] aim to explore the methods of protection and renovation of historic districts. From the perspective of urban acupuncture concepts and based on the current situation of China's historic districts, they consider the protection and renovation methods of historic districts, regard urban negative spaces as sources for renovation, historic streets as acupuncture points, and use urban acupuncture as a treatment method. Combined with real cases, they analyze how to use "minimally invasive" and "progressive" concepts of urban acupuncture to explore cultural baselines, activate negative spaces, and achieve the effects of protecting street ecology, improving street vitality, and restoring neighborhood relations. This initiates a discussion on how to implement the protection and renovation of historic districts from the perspective of culture, form, and business format, and also proposes new ideas for the protection and renovation of historic districts.

In summary, the research on the design of neighborhood reconstruction in China has made great progress. From the early preservation of historical and cultural heritage to modern functional optimization and intelligent application, these studies have provided us with a rich theoretical foundation and practical experience. Future neighborhood reconstruction projects should continue to focus on humanistic care and sustainable development, creating a more comfortable neighborhood environment for living, business and tourism through innovative design concepts and advanced technological means.

1.3. Current status and analysis of foreign research. Foreign countries have accumulated rich theoretical and practical experience in the study of neighborhood reconstruction design according to the urban theory of urban acupuncture. As early as 1982, the famous Spanish architect and urbanist Malares combined the "acupuncture" of traditional Chinese medicine with the urban regeneration practice of the Barcelona project and proposed the concept of "urban acupuncture", interpreting it as a small-scale intervention with a catalytic strategy for urban development. Since then, scholars such as Professor Kenneth Frampton[32] of Columbia University have also conducted in-depth research on the theory of "urban acupuncture" from an architectural perspective. These studies emphasize that on the basis of preserving the deep structure of the district, appropriate acupuncture points and corresponding design routes are selected, and old districts are renovated in a small-scale and gradual manner to achieve the change of the shape of the district functions, cultural revitalization and ecological restoration.

Through the implementation of "urban meridians", the environment is activated and the overall vitality of the district is enhanced, which provides a useful reference for urban renewal. Although the theory of urban acupuncture was formally proposed in 1982, since 1961, scholars have been constantly exploring new ways to "use small and flexible ways to realize urban transformation" and "pursue continuity, gradualness, delicacy and richness of change" in the comprehensive urban renewal involving large-scale demolition and transformation. The model of small-scale and inclusive transformation has become a direction of improvement, which is emphasized by the planning scholar K. Alexander in his book "The Oregon Campus Planning Experiment".

In Jane Jacobs's[38] (1961) book Death and Life in Great American Cities, she argues for "continuous, gradual, complex, and subtle change," advocating renewal starting on a small scale.

Mumford's[50] (1961) book "The History of Urban Development" proposes to build cities centered around people, emphasizing the scale of people and meeting their social, emotional and psychological needs.

In his work (1973) "Small is Beautiful", Schumacher[30] advocates a method of production based on the human scale. It can be seen that the idea of "minimally invasive" urban renewal coincides with the idea of "urban acupuncture and moxibustion", which promotes small-scale intervention to influence large-scale renewal, which lays the ideological foundation for the proposal of "urban acupuncture and moxibustion".

After M. Morales officially put forward the theory of urban acupuncture, it had a huge impact on the academic circles of architecture and urban planning. Inspired by this, many scholars have developed and improved the theory from different perspectives, such as the theory of "megastructural form". He proposed that from the perspective of architectural design, equal attention should be paid to the form and function of architectural renovation, so that new and old buildings can be organically integrated with the urban environment and physical energy, and create a space with regional characteristics; "Urban acupuncture" focuses on the effect of applying and ensuring the implementation of regional policies, and advocates stimulating local focal points to activate surrounding areas through material and non-material intervention methods such as material transformation, political guidance, etc., which has stronger practical operational significance.

1.4. Block Redevelopment Design Research. Block redevelopment design research abroad has gathered the wisdom and thoughts of numerous prominent scholars. Jane Jacobs[38] is known as the "mother of modern urban planning", and in her works she deeply criticized the dominant urban redevelopment policies of the time, especially the "big tear down and big build" model. She emphasized that the diversity and vitality of urban areas stem from the daily lives and interactions of residents, advocating for preserving and stimulating this diversity in neighborhood redevelopment, rather than simply replacing it with modern architecture and planning concepts. Jacobs' views had a profound influence on later urban planning and neighborhood redevelopment.

Bernard Rudofsky[5], as an architectural historian and anthropologist, explored the deep connection between architecture, people and the environment in his works. Rudofsky emphasized that neighborhoods are not just a collection of buildings, but also carriers of culture, history and emotions. In Neighborhood Redevelopment, he advocates for respecting and integrating these elements to create public spaces that are historically continuous and meet the needs of modern life.

The research of the renowned urban design and planning scholar, Alexander W. Moudon[8], focuses on how to create a livable and sustainable urban environment. Moudon[8] has proposed many innovative ideas in his literature on neighborhood redevelopment design, such as emphasizing pedestrian convenience, increasing green spaces, and promoting community interaction. He believes that neighborhood redevelopment is not only about reconstructing the material space, but also transforming the social structure and culture of the community.

In addition, many other scholars have also made important contributions to the field of neighborhood redevelopment design. In the relevant literature, they have explored the problems and opportunities of neighborhood redevelopment from different perspectives and proposed many innovative solutions. These studies together constitute a rich treasury of foreign research on street reconstruction design, providing useful recommendations and references for design strategies and implementation paths.

1.5. Research on the design of neighborhood reconstruction according to the theory of urban acupuncture. Street reconstruction design is a dynamic and increasingly mature field of research. Kenneth Frampton[32] and other famous scholars in the field of architecture have deeply discussed the application of the theory of urban acupuncture and cauterization in urban regeneration strategies in their literature. They point out that urban acupuncture and cauterization can not only maintain the historical context of the city, but also introduce new functions and vitality to achieve the organic renewal of urban space. This perspective

provides important theoretical support for cultural heritage and innovation in neighborhood reconstruction.

A. Moudon[8] and other scholars have deeply analyzed the practical path of the theory of urban acupuncture and cauterization in street reconstruction from the perspectives of sociology and environmental science. They emphasized that the strategy of updating the style of acupuncture and cauterization should focus on community participation and residents' needs, and achieve the social, cultural and environmental goals of street reconstruction through precise positioning and implementation. This view has received wide attention and confirmation in recent studies. In addition, with the deepening of research, more and more scholars have begun to pay attention to the adaptability and innovative application of the theory of urban acupuncture and cauterization in different regional cultural environments.

For example, in combination with specific urban cases, we discussed how to use the theory of urban acupuncture and cauterization to design street reconstruction while maintaining urban characteristics. These studies have not only enriched the content of the urban theory of urban acupuncture, but also provided richer and more diverse theoretical support and practical guidance for street reconstruction design.

It is worth noting that the research on street reconstruction design according to the theory of urban acupuncture in foreign countries also shows a trend of interdisciplinary cooperation. Scholars from various disciplines such as architecture, urban planning, sociology, and environmental science have begun to participate in street reconstruction projects. Through interdisciplinary cooperation and exchange, the innovative application of urban acupuncture theory in street reconstruction has been promoted. This interdisciplinary research cooperation model not only helps to solve the complex problems of street reconstruction, but also provides new ideas and methods for deepening and developing the theory of urban acupuncture and moxibustion.

The theory of urban acupuncture, based on the concept of traditional Chinese medicine acupuncture, views the city as an organic life, and through the precise intervention of urban "acupuncture points", activates the vitality of the street and promotes the overall development of the city. Yan Jingwen[73] et al. have deeply discussed the application of urban acupuncture and cauterization theory in the renovation of historical and cultural districts in the article “Research on the renovation strategy of historical and cultural districts based on the concept of “Urban acupuncture and cauterization” - a case study of District No. 15 of the ancient city of Suzhou”. They summarized and analyzed the spatial composition of the districts by classification, analyzed the distribution of spatial elements, focused on the manifestations of arthralgia of the districts during modernization, and proposed a renovation strategy guided by this concept of “acupuncture”, including functional replacement, spatial reconstruction, cultural revival, etc., which provides an effective way to restore the vitality of the districts.

In addition, Xiao Wei[69] has conducted an in-depth study on the design strategy of the renovation of the old city from the perspective of urban acupuncture theory in the research “Theory of Urban Acupuncture and Cauterization Based on the Design of the Renewal of the Old City”. She noted that during the renovation of the old city, attention should be paid to the historical context and regional characteristics of the city, and the organic renovation and sustainable development of the old city should be achieved through precise positioning of "acupuncture points", micro-renovation, small-scale progressive transformation and other methods.

In the article "Application and Practice of Urban Acupuncture and Moxibustion Theory in Neighborhood Reconstruction", Wu Jingxuan[67] et al. confirmed the practicality and feasibility of the urban acupuncture theory in neighborhood reconstruction through empirical case analysis. They developed the design principles, methods and technical means of the urban acupuncture and moxibustion theory in neighborhood reconstruction combined with specific

projects, providing solid theoretical support and practical recommendations for the design of neighborhood reconstruction.

Therefore, all these studies not only enrich the theoretical subtext of the urban acupuncture and moxibustion theory in street reconstruction design, but also provide valuable recommendations and references for practical work. In the future, with the acceleration of urbanization and the improvement of residents' living standards, the application of the urban acupuncture and moxibustion theory in street reconstruction design will be wider and deeper, which will bring new vitality to urban renewal and sustainable development.

1.6.Research methods. The following methods were used to carry out the scientific work:

- *analysis* (various sources on the formation of urban space taking into account the urban theory of urban acupuncture);

- *synthesis* (identification of the main groups of approaches responsible for creating an updated environment);

- *comparison* (comparison of the needs of different groups of users of this space);

- *abstraction* (formation of conclusions and recommendations on the design of the interior exhibition space);

- *graphic-analytical* (creation of tables and diagrams);

- *experiment* (use of the obtained research results in the formation of one's own project concept and their further implementation in the development of a design proposal).

Conclusions to the first chapter

1. It is determined that in continuous theoretical research and practice, foreign scholars have proposed theories such as urban acupuncture and "urban catalyst" to explore the transformation of urban renewal methods to solve problems such as

urban decline. Through continuous practical application, they have gained successful experience in urban reconstruction projects such as Barcelona, which provides an excellent model for further development.

2. It is proved that the biggest feature of the domestic urban acupuncture theory is that it is separated from the research of a separate theory. It is integrated and developed with other research theories such as urban renovation and urban micro-renewal. Although there are still shortcomings in practical application, it has achieved certain results in the renovation of urban villages and community reconstruction.

3. It is found that foreign countries are relatively mature in both theoretical and practical application, and scholars of the same period have gradually improved this theory. Domestic theories are combined with other theories for related research. Related design practices mainly concern large-scale spaces such as urban village reconstruction and community reconstruction. The use cases of “urban acupuncture” to study the design of street reconstruction are also mostly focused on the research on the reconstruction of historical and cultural quarters.

4. It is found that there are relatively few studies on the design of neighborhood reconstruction with modern characteristics. Based on this problem, the research content of this paper is designed to further explore the practicality and relevance of this theory to the design of neighborhood reconstruction. 5. It is concluded that the current research situation of street reconstruction design according to the theory of urban acupuncture in foreign countries shows numerous characteristics such as interdisciplinary integration, innovative practice, and regional cultural adaptability. In the future, with the deepening of research and the strengthening of interdisciplinary cooperation, it is expected that research in this field will provide more comprehensive and in-depth theoretical support and practical recommendations for urban renewal and street reconstruction.

SECTION II. DESIGN PROPOSAL FOR THE EXHIBITION SPACE OF THE FORMER TOBACCO FACTORY IN FENGYANG

CONCEPT

A design study on the reconstruction of industrial relics under the concept of double urban renovation — a case study of the Mentai Chimney Drying Tobacco Factory in Fengyang, Anhui Province. Project address: Fengyang Mentai Zhe Tobacco Factory, Anhui Province, China.

The former site of the Fengyang Mentai Zhi Tobacco Factory in Anhui Province is an important scenic spot along the Huaihe River Scenic Belt in Fengyang. The factory is located north of the Beijing-Shanghai Railway, west of the Benbu South Station of the Beijing-Shanghai High-Speed Railway, and south of the Nanluo Expressway and Hexu Expressway. Project Summary: The interior renovation of the Anhoi Fengyang Mentai Zijiang Tobacco Factory combines the concepts of dual urban renovation with industrial heritage revitalization.

Guided by the principles of urban renovation and ecological restoration, this project systematically explores the historical context of the factory and contemporary issues. Through three-pronged solutions—physical renovation, social rehabilitation, and cultural heritage preservation—the initiative explores the synergistic mechanisms between architectural, natural, and socio-ecological elements. Enriching the practical application of the dual urban renovation philosophy in the city, it establishes design principles and strategies for the revitalization of industrial heritage, offering practical recommendations for future urban renewal projects.

2.1. Research plan for the implementation of the project proposal.

When designing the industrial heritage renovation according to the concept of dual urban renovation, it is necessary to collect large and detailed data to ensure that the project not only conforms to the core idea of dual urban renovation, but also can effectively stimulate the vitality of the factory site. In addition, it is necessary to conduct field studies of the current situation on the plant site and acquire first-hand data for further design.

2.2. Basic theoretical research.

This study explores the basic concepts, methodologies and case studies of urban dual renovation (urban renewal and ecological renewal), analyzing their role in contemporary urban regeneration. It collects successful domestic and international urban renewal examples within this framework, including industrial heritage revitalization projects, community redevelopment and landscape enhancement. By exploring their design strategies, implementation processes and performance evaluation, the study provides practical recommendations for industrial heritage preservation. The study further clarifies key design approaches such as spatial optimization, ecosystem restoration and cultural integration.

2.3. Field visits and research.

Through on-site research including photography, field visits and research, we conducted a comprehensive assessment of Fengyang Mentai Tobacco Factory in Anhui Province. The study covered its historical history, geographical location, construction quality, supporting facilities and land use rights to collect first-hand data. Based on this framework, we conducted an in-depth analysis of the architectural structure, environmental conditions and functional planning of the tobacco factory. This allowed us to identify key issues and priorities for reconstruction by studying the needs, preferences and behavior patterns of potential user groups. This data provided important guidelines for functional positioning and commercial planning. We developed specific reconstruction

strategies, including functional transformation, spatial optimization and ecological design, developed detailed design plans with time frames, and laid the foundation for further design implementation.

2.4. Feasibility analysis of the design solution:

• Appropriate political support for the design of district reconstruction. The design of industrial heritage transformation is quite feasible in terms of political support. In recent years, the National Development and Reform Commission, together with other departments, has issued several documents emphasizing the accelerated promotion of the protection and utilization of industrial heritage in old industrial cities, as well as the promotion of urban renewal and transformation.

• The basic concept of the dual urban renewal approach. Consistent with the design approach of the Fengyangmen Taiji Tobacco Factory Renovation. The basic idea of the dual urban renewal concept is ecological renewal and urban renovation, aiming to combat "urban diseases", improve the living environment and transform urban development methods. Through the renovation, the tobacco factory can be modernized while maintaining its unique cultural charm, thereby enhancing the cultural identity and sense of belonging of the residents.

2.5. Program Planning and Design.

Drawing on the philosophy of urban renewal and the results of field research, we updated the floor plans of the tobacco factory through a targeted “renovation” of the identified problems. The spatial planning prioritizes engaging visitors with cultural exhibition halls, artisan workshops, tea bars for relaxation, co-creation spaces, and open reading areas, while optimizing travel routes to transform the site into a welcoming community hub.

For ecological restoration, we removed invasive weeds, planted native vegetation, installed permeable pavement, and upgraded drainage systems. For

cultural restoration, we explored the factory's heritage and the regional culture of Fengyang through creative markets. The comprehensive planning integrates interdisciplinary research in architecture, folklore, cultural studies, history, art, cultural relics, tourism, and sociology to strengthen the theoretical foundations.

Conclusions to the second chapter

1. The design results of this project are comprehensively presented through detailed design visualizations and research work on the urban theory of urban acupuncture. The visual documentation reflects all spatial dimensions of the smoke-cured tobacco factory, from architectural exteriors to interior layout, landscape vegetation to newly designed functional areas.

2. Each element is carefully designed to faithfully convey the design philosophy and spatial impression. Technical drawings include cross-sections, floor plans, facades and 3D visualizations, offering a multi-dimensional demonstration of the transformation of the renovated facility. The academic work contains an in-depth analysis of the design rationale, reconstruction strategies, technical specifications and expected socio-cultural impacts, offering a substantial theoretical basis for understanding the main design concepts.

3. It is proved that through this set of complete images and works with design effects, the achievements and practical value of the Fengyangmentai Tobacco Factory Renovation Project in Anhui Province under the concept of dual urban renovation are fully reflected.

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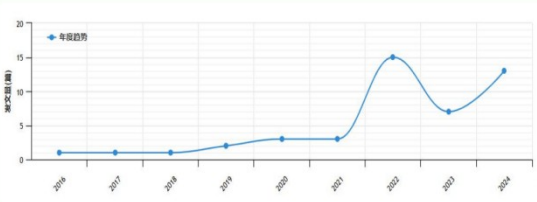
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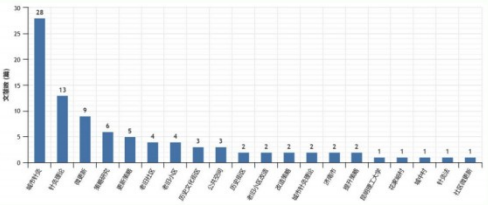
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APPENDIX A. (Tables and diagrams)





Theoretical Foundation

The theory of urban acupuncture originated from the urban renovation method created by Spanish architect Morales in the 1980s. Domestic scholars, based on the introduction of this theory, have carried out localized explorations in combination with the actual situation of urban development in China.

Literature Review

The biggest feature of the theory of urban acupuncture in China is that it breaks away from single-theory research and develops through integration with other research theories. Abroad, scholars pay more attention to preserving the historical and cultural heritage and the ecological environment of cities.

Table 1. Theoretical Foundation



Table 2. Feasibility analysis of the project solution

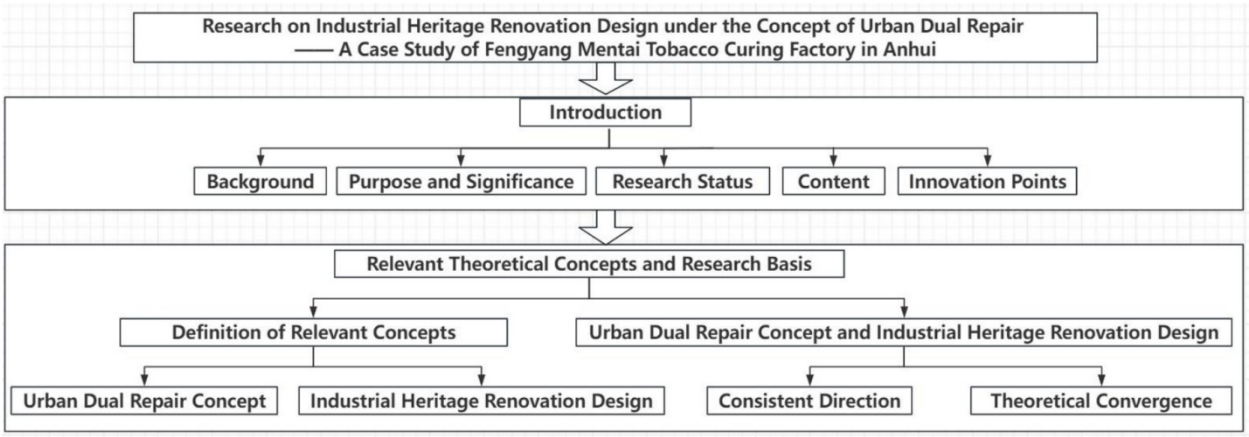


Table 3. Feasibility Analysis of the Project Solution. Conducting background studies, domestic and international research, and theoretical analysis on renovation design is a core prerequisite to ensure that the renovation plan is scientifically feasible, locally relevant, and forward-looking.

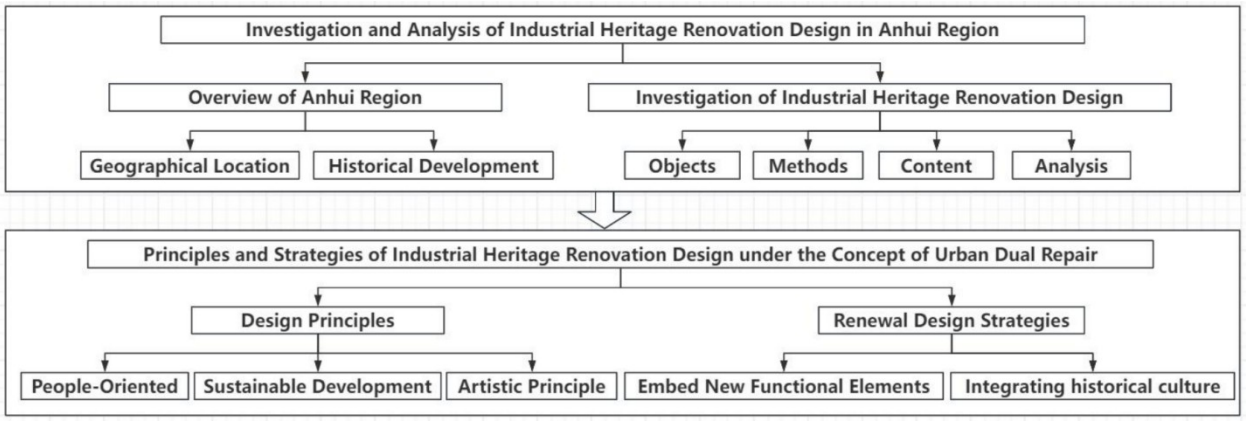


Table 4. Analysis of design principles and strategies is the key bridge that transforms preliminary theories and background analysis into actionable design solutions.

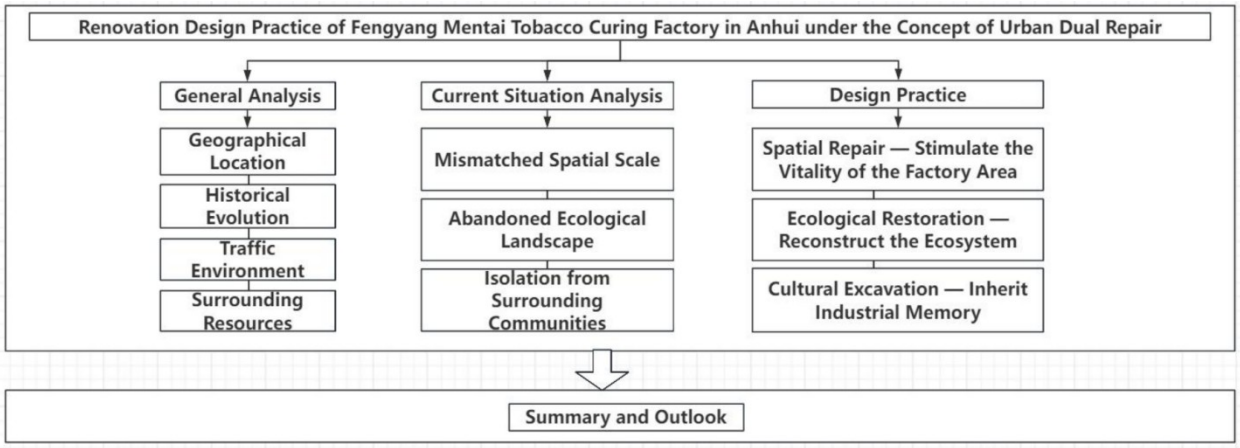


Table 5. Planning the outline of renovation design in advance is a key prerequisite to ensure that the renovation accurately aligns with the concept of 'Urban Double Repair' and to avoid disorderly design.

Dimension	Key Points	Specify in detail
Strengths	The culture of Anhui during the Ming Dynasty is worth exploring	Located in Fengyang, Anhui, it can be linked with Ming Dynasty culture — the Four Masters of the Ming — to create a regionally distinctive space and enhance differentiated competitiveness.
	The surrounding residents have a solid foundation	Local residents have a historical emotional connection to the factory area, and when expanding community services in the future (such as cultural experiences), it is easier to gain support from initial users.
Weaknesses	Spatial structure aging	The existing factory buildings are mostly old structures, with damaged walls and load-bearing structures, and the internal layout does not meet the requirements of modern production or service functions.
	Mismatch of spatial scale	The floor height, bay spacing, and other spatial dimensions of the original industrial building are incompatible with the new potential scenarios, and adjustments are needed to meet usage requirements.
Opportunities	The community renovation needs are clear	The surrounding communities have needs for infrastructure upgrades and additional public activity spaces. The factory area can collaborate with the community for renovations by transforming some areas into cultural exhibition halls to meet community demands.
	The living needs of residents are increasing	The growing demand from residents for leisure and cultural activities can be met through renovations, filling gaps in community services and achieving business transformation.
Threats	The renovated spaces and communities have barriers	There may be a psychological distance between the factory area and the community, and residents may have a vague understanding of the factory's functions. If this barrier is not broken, it is easy for the renovated space to be neglected.
	There are obstacles to community integration	In terms of cultural expression, if local characteristics are not combined with contemporary cultural symbols, it will be difficult to evoke emotional resonance among residents.

Table 6. SWOT Analysis

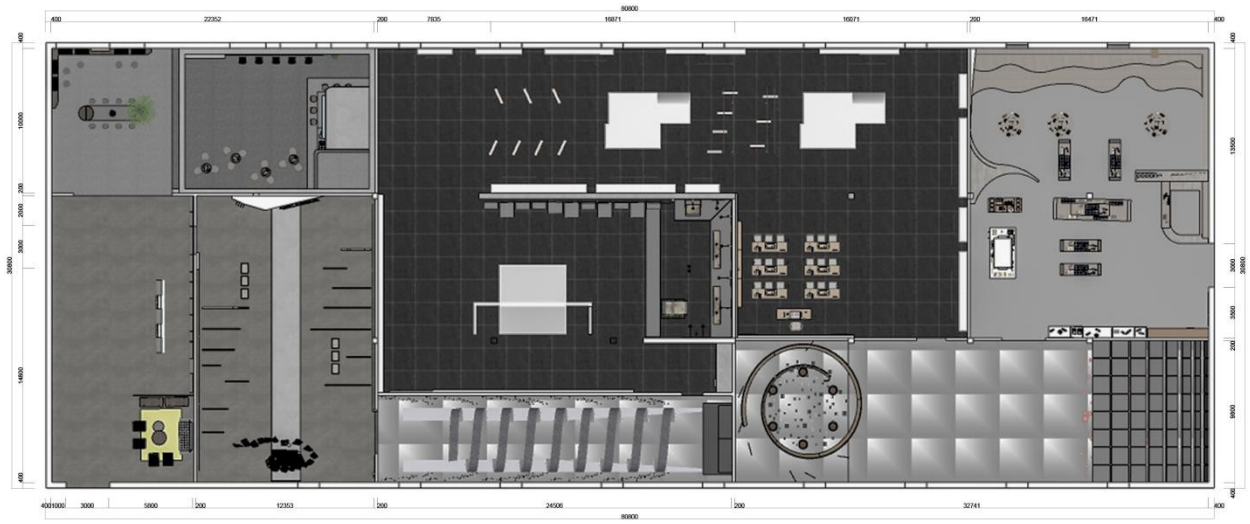
Design Strategy	Division	Specific design strategy	Core display content/functions	Purpose
Introduce new features	Main Exhibition Hall	Preserve the original architectural structure of the flue-cured tobacco factory (such as factory beams and columns, roof trusses), combined with modern exhibition installations (display cabinets, lighting systems)	Ming Dynasty paintings and calligraphy works, mainly by the Four Masters of the Ming Dynasty	Balancing a sense of history with modern exhibition requirements
	Immersive exhibition hall	Using multimedia technology (projection, interactive screens) to create an immersive environment	An immersive experience traveling through the tunnel of history	Enhance the enjoyment and engagement of visits
	Cultural and Creative Products Sales Area	Cultural and creative products themed around calligraphy and painting, local cultural and creative products from Fengyang	Ming-style cultural derivatives, Fengyang specialties	Achieve cultural dissemination and the transformation of commercial value
Integrate into local culture	Calligraphy Exhibition Space	Select key areas and present calligraphy works through wall textures and display panels.	Reproductions of calligraphy masterpieces by famous Ming Dynasty calligraphers (such as Wen Zhengming and Dong Qichang) and interpretations of calligraphy culture	Highlighting the cultural heritage of Fengyang during the Ming Dynasty
	Painting Exhibition Space	Using a combination of framed displays and scene restoration	Reproductions of paintings by the Four Masters of the Ming Dynasty (Shen Zhou, Wen Zhengming, Tang Yin, Qiu Ying) and the background stories of the artworks	Create the artistic atmosphere of the Ming Dynasty and enhance the sense of culture.

Table 7. Design strategies used in the plan

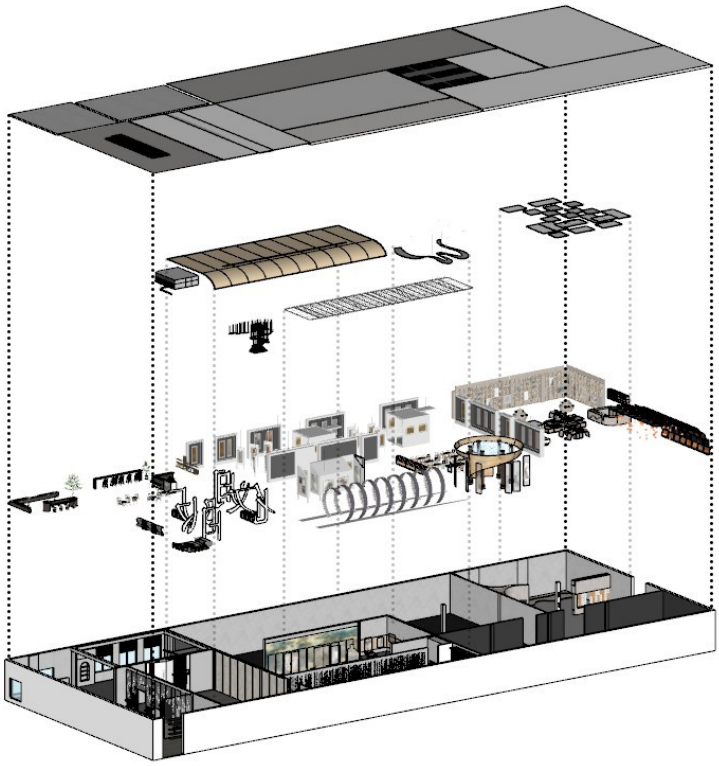
Color Type	Specific color	Application space	The purpose of color usage
Main color tone	White, yellow (ancient painting)	Preamble Hall Main Exhibition Hall Immersive Exhibition Hall Cultural and Creative Sales Area	White establishes a simple and modern spatial foundation, ensuring that the exhibits are clearly presented; yellow is often used in Chinese paintings to depict landscapes, flowers, and birds. In traditional ink paintings, yellow can be used to represent withered mountains and rocks, dead wood, or ripe grains, creating a sense of historical depth and artistic atmosphere.
Auxiliary color	Black, gray	Preamble Hall Historical Tunnel Main Exhibition Hall Immersive Exhibition Hall	Black enhances the sense of spatial layering and sophistication, while gray neutralizes the visual tension of the main color tone. Together, they balance the warmth and coolness of the space, creating a stable and refined texture. The reflective properties of the flooring materials are used to increase the sense of openness, adapting to the interactive experience needs of an immersive exhibition hall.
Accent color	Wood color	Immersive Exhibition Hall Cultural and Creative Sales Area	Use the natural wood color to soften the cold and hard feeling of black, white, and gray, adding a sense of warmth to the space; pair with wooden materials to echo the traditional decorative elements of the Ming Dynasty, enhancing the cultural atmosphere while meeting the functional needs of exhibition and sales.

Table 8. Analysis of Color Usage

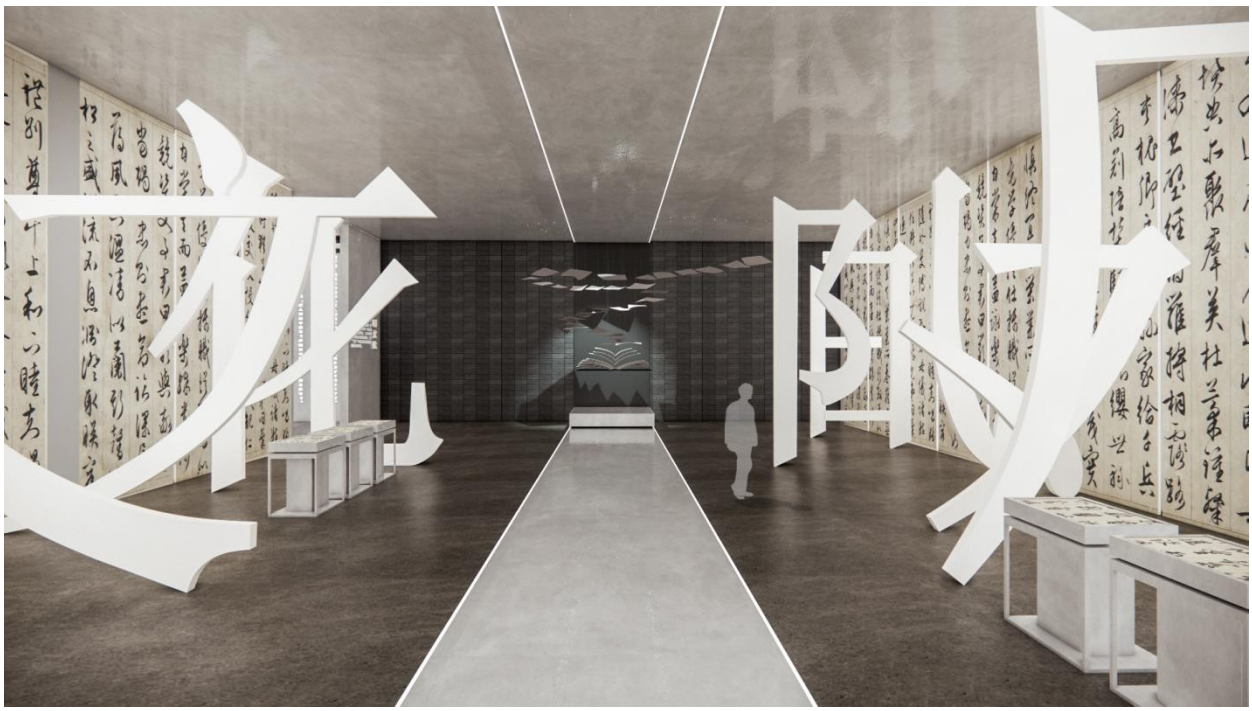
APPENDIX B. (Visualization of the exhibition space interiors)



Floor Plan

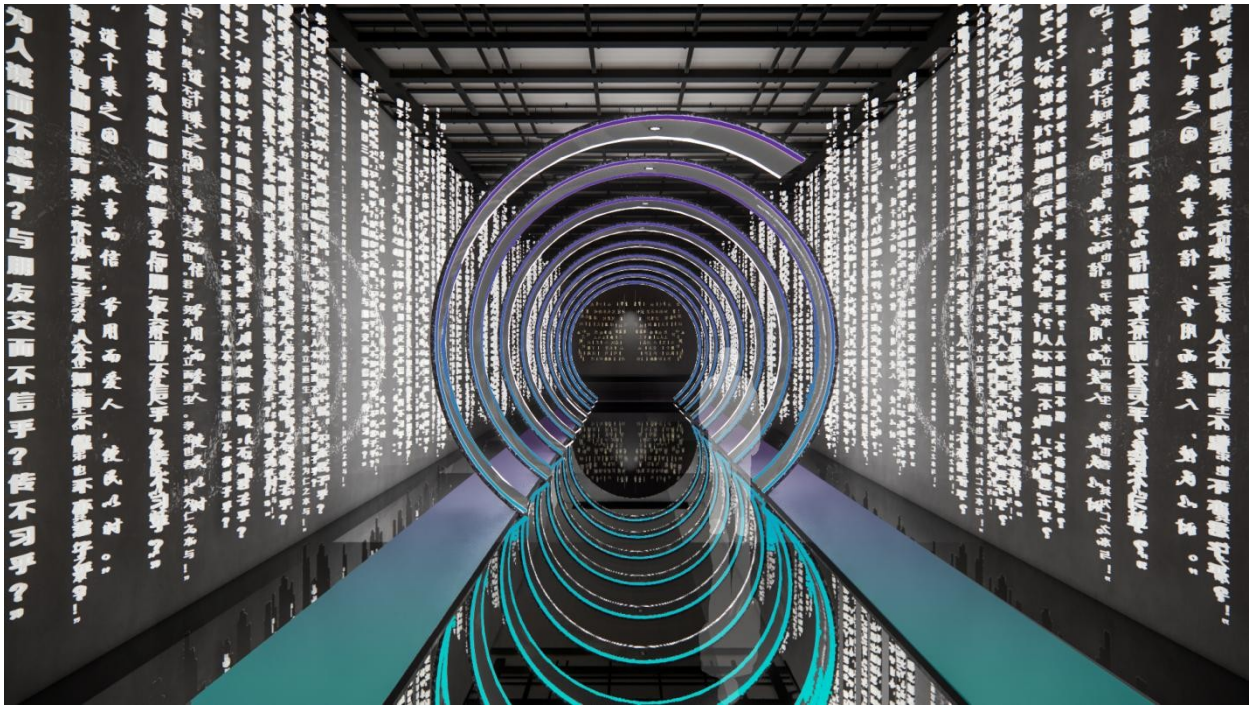


Spatial Explosion Diagram



Preamble Hall

Displaying calligraphy works from the Ming Dynasty.



Historical Tunnel

Creating a tunnel feel through lighting, connecting the foyer and main exhibition hall.



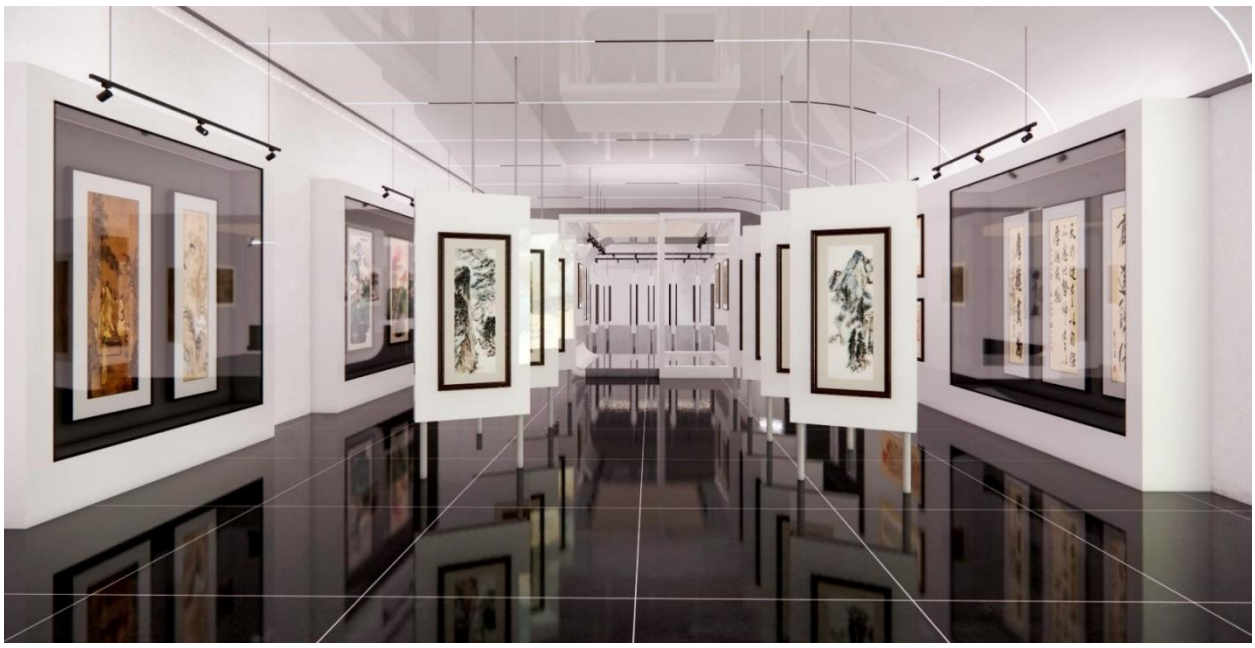
Main Exhibition Hall

Display the paintings of the four Ming families.



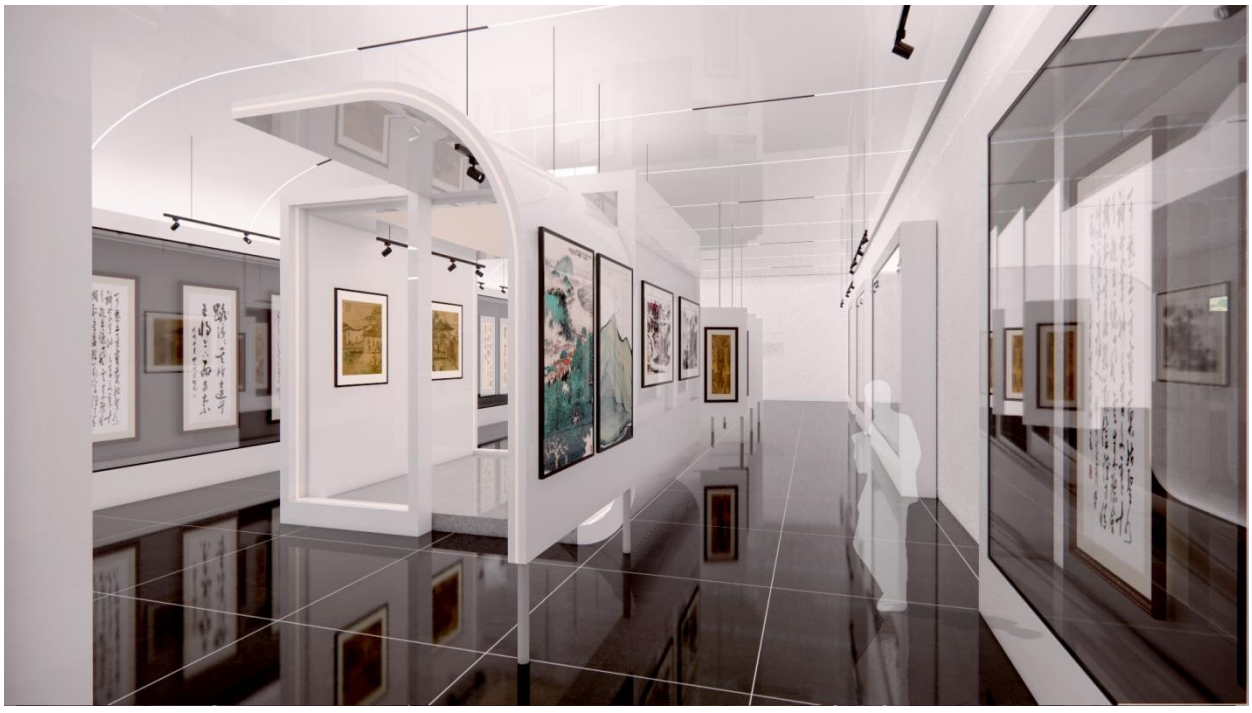
Main Exhibition Hall

Introduce the relevant information of the four Ming families.



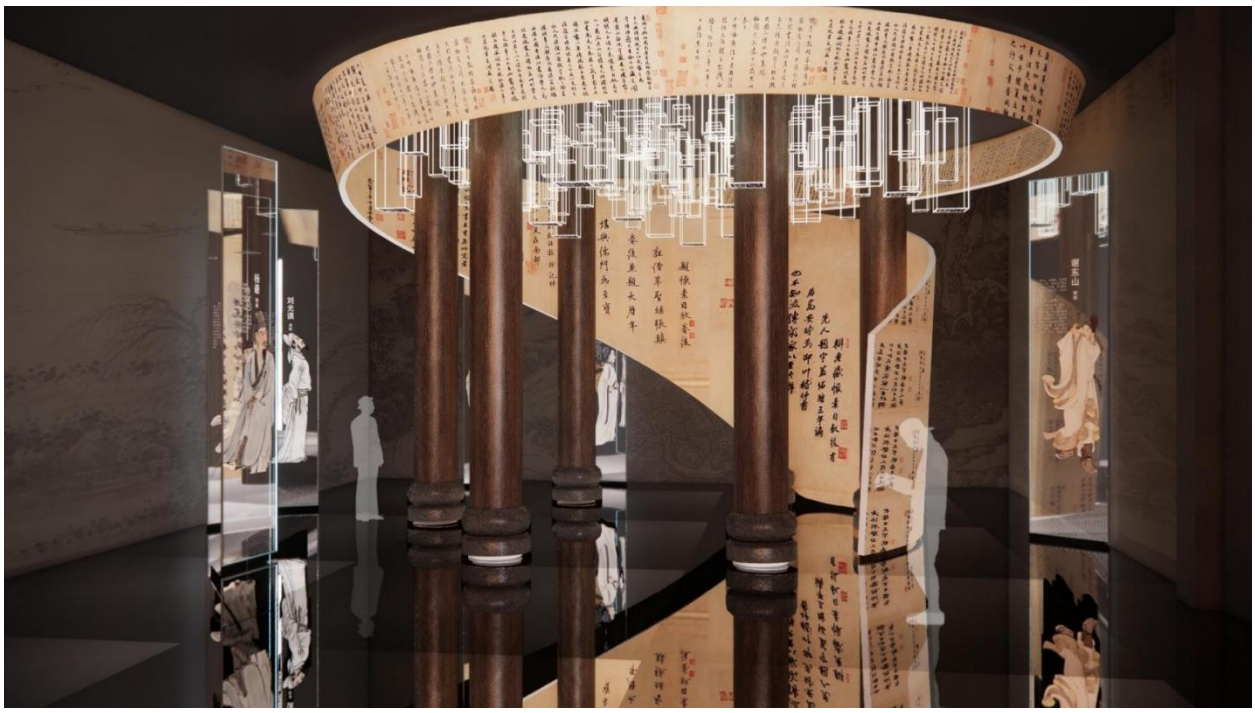
Main Exhibition Hall

The paving is mainly black and white, with a focus on calligraphy and painting works.



Main Exhibition Hall

The curved shape makes the space interesting.



Immersive Exhibition Hall

Immersive dialogue with Ming dynasty calligraphers and painters through digital technology.



Cultural and Creative Sales Area

The curved shape corresponds to the "landscape" form in landscape paintings.



Cultural and Creative Sales Area

Selling cultural and creative products related to Ming Dynasty calligraphy and painting.