

The Micro-renewal of Streets and Alleyways in Qingzhou Ancient City Based on The Study of "Acupuncture Theory"

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Abstract: The microspace design of Dongmen Street and alleys in Qingzhou Ancient City is vital for cultural heritage preservation and urban renewal. Traditional urban planning and microspace design have limitations, requiring a more flexible approach. This study aims to apply "acupuncture and moxibustion" theory to Dongmen Street's microspace design, achieving heritage protection and urban renewal goals. It introduces Qingzhou Ancient City and the theory's basis, including concepts, principles, and methods. The study proposes an elastic design scheme for Dongmen Street's microspace based on this theory. By respecting historical context, local culture, and integrating modern design theories, flexible design schemes can enhance microspace elasticity during urban renewal. This research provides innovative ideas for Qingzhou's ancient city microspace design, contributing to heritage preservation and urban development. Future exploration will refine solutions aligning better with ancient city preservation and urban renewal needs, furthering the city's heritage and development.

Keywords: Acupuncture and Moxibustion Theory; Microspace; Elastic Design; Qingzhou Ancient City; East Gate Street.

1. Introduction to Qingzhou Ancient City

1.1. Historical Background

Qingzhou Ancient City, renowned for its historical and cultural significance, has roots dating back to the Warring States period, serving as a hub for political, economic, and cultural activities. Throughout history, it changed hands from Qi to Zhao, Qin, Han, Wei, Jin, and others, becoming a vital center during the Wei-Jin-Northern and Southern Dynasties, fostering regional development. During the Tang Dynasty, Qingzhou transformed into a prominent commercial and cultural hub, connecting Eastern and Western cultures and trade. The Song Dynasty solidified Qingzhou's importance as a trade and maritime defense base, leading to prosperity. The city expanded with improved planning, fortified walls, and organized streets and markets. Qingzhou Ancient City represents not only its developmental journey but also an integral part of Chinese history, culture, and art. Through cultural inheritance, it showcases historical remnants and cultural treasures, attracting tourists and researchers alike.

1.2. Geographic Features

Qingzhou Ancient City, situated in northern Shandong, plays a pivotal role as a transportation hub between the Jiaozhou-Jinan and Beijing-Shanghai Railways. Located in the fertile Yellow River plain, it's known as the "Land of Fish and Rice." Its distinct topography, with an east-high and west-low slope, shapes its unique "shell-like" terrain, influencing street and alley design. The city's layout leverages this hilly terrain, resulting in multi-level and decentralized streets and alleys, with East Gate Street connecting cultural sites and commercial hubs. Qingzhou's rich culture is reflected in East Gate Street, emphasizing the need to preserve its historical heritage. The city's strategic position facilitates cultural exchanges, attracting people from diverse regions. This

cultural interaction has shaped Qingzhou's unique atmosphere and diverse characteristics. In conclusion, Qingzhou Ancient City's geographical and cultural significance profoundly impacts street and alley design, highlighting the importance of preserving its distinct charm and heritage.

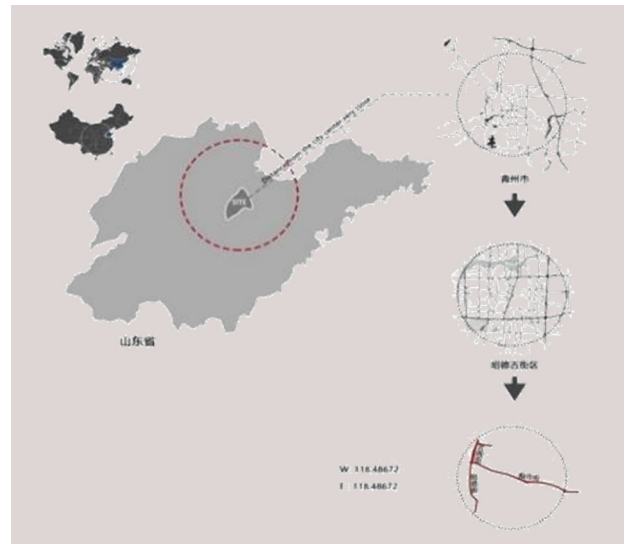


Figure 1. Location Map

1.3. Cultural Heritage

Qingzhou Ancient City, one of Shandong Province's ten historical and cultural cities, holds a deep historical and cultural legacy. Renowned in China and the province, it has nurtured famous figures and cultural treasures, providing abundant folklore resources. Preserving a wealth of heritage like city walls, ancient buildings, temples, and streets, Qingzhou showcases diverse architectural styles from different eras, holding historical and artistic value. It inspired literary works like "Qingzhou Zayong" and traditional art forms, contributing to its cultural richness. Qingzhou's cultural heritage fuels creative industries and design, serving

as a source of inspiration for art, crafts, and more. This fosters innovation and shapes the city's image. Unique cultural elements like grand yangge dances, kite flying, and distinctive carving art, especially on East Gate Street, carry profound cultural connotations. In conclusion, Qingzhou Ancient City's rich historical and cultural heritage and unique traditions offer a wealth of inspiration for flexible microspace design, making it a valuable resource to explore and utilize.

2. Acupuncture Theory and Microspace Design

2.1. Application of Acupuncture Theory in Urban Planning

Acupuncture theory is an essential therapy within traditional Chinese medicine, known for its significant effectiveness in treating various human ailments. With the acceleration of urbanization, people's living environments have become increasingly complex. Therefore, urban planning and design have placed more emphasis on human care and environmental comfort. In this context, acupuncture theory is gradually finding widespread application in urban planning and design.

Firstly, acupuncture theory is applied in shaping the urban morphology. Acupuncture theory posits that the human body's acupoints and meridians form an organic whole, and stimulating different acupoints can have therapeutic effects. In urban planning, different areas of the city have distinct characteristics, such as commercial districts and residential areas. Therefore, it is essential to consider their unique features and optimize their combinations during the planning process. Acupuncture theory emphasizes the importance of unobstructed Qi and blood circulation for health and well-being. Similarly, in urban planning, this concept can be applied by designing a well-connected transportation network, public spaces, and landscape features to facilitate the flow of people, goods, and information within the city. This contributes to enhancing the city's vitality and convenience while creating a comfortable and efficient urban environment.

Secondly, acupuncture theory is of significance in urban landscape design. In urban landscape design, various elements are employed to create different atmospheres, such as green belts, courtyards, and gardens. Acupuncture theory's acupoints correspond to specific locations on the human body's meridians, making it possible to use these acupoint locations as design elements in urban landscape design. Through a thoughtful layout and combination, these acupoint-inspired elements can align more closely with human physiological and psychological needs, making them more perceptible and accepted.

Acupuncture theory emphasizes individual differences and personalized treatment approaches based on an individual's constitution, condition, and needs. In urban planning, it is crucial to consider the needs and characteristics of different resident groups, providing diversified public service facilities and spaces to meet the requirements of various people. By implementing personalized planning and design, diverse and inclusive urban environments can be created, thereby enhancing residents' quality of life and happiness.

In summary, acupuncture theory holds extensive prospects for application in urban planning and design. During the urban planning and design process, innovative exploration and application can be carried out based on the concepts and methodologies provided by acupuncture theory, continually

enriching and enhancing the human care and environmental comfort aspects of urban planning and design.

2.2. Concept and Principles of Microspace Design

Microspace design refers to the meticulous planning and design of small-scale spaces within urban planning and architectural design. Microspaces can include streets, squares, flower beds, courtyards, or small areas within the interior spaces of buildings. Microspace design places a strong emphasis on attention to detail and careful treatment, aiming to create comfortable, aesthetically pleasing, and functional small urban spaces. The principles of microspace design can be summarized as follows:

1. **Appropriate Scale:** Microspace design should determine an appropriate scale based on specific locations and functional requirements. Considering factors such as foot traffic, functional needs, and the surrounding environment, determining the size of microspaces that can fulfill functional requirements while harmonizing with the surrounding context is essential.

2. **Functional Suitability:** Microspace design should be planned and laid out based on specific functional purposes. Depending on the intended functions of microspaces, such as relaxation, social interaction, or exhibition, it is essential to arrange elements like seating, lighting, and landscaping thoughtfully to provide convenient and comfortable user experiences.

3. **Visual Guidance:** Microspace design should prioritize visual guidance, directing people's gaze effectively through thoughtful layouts and landscape design. Employing suitable colors, materials, and forms can enhance the attractiveness and recognizability of microspaces.

4. **Spatial Division and Continuity:** Microspace design should focus on both spatial division and continuity. By appropriately placing enclosures, landscape elements, or variations in ground materials, different spatial areas can be defined while maintaining corresponding continuity and flow, allowing people to use and move within microspaces orderly.

5. **Material Selection and Detail Handling:** Microspace design should emphasize material selection and detail handling. Choosing materials that are durable, easy to maintain, and aesthetically pleasing is crucial. Attention to detail ensures that microspaces present a refined and complete image.

6. **Consideration of Sustainability:** Microspace design should consider sustainability factors. Environmental protection and energy efficiency should be prioritized in material selection, landscaping configuration, and energy utilization, reducing the consumption of natural resources and enhancing the sustainability of microspaces.

In the practice of microspace design, it is essential to integrate acupuncture theory, applying it to the design of microspaces. Acupuncture theory, being a part of traditional Chinese medicine, primarily studies the effects of acupuncture points and specific areas on the body. This knowledge can greatly inspire microspace design. For example, designers can use acupuncture theory's meridian pathways as inspiration for planning the paths and connections within microspaces. By drawing from acupuncture theory's methods of stimulating acupoints, specific elements within microspaces can be designed to achieve better expression and comfort. These measures can help improve the usability and effectiveness of the spaces,

making microspace design better aligned with users' needs.

Moreover, microspace design should adhere to principles such as human-centeredness, convenience, comfort, and safety. The application of acupuncture theory in microspace design can help achieve these design principles more effectively. Therefore, when conducting microspace design, it is advisable to leverage the knowledge of acupuncture theory and apply it in practical design to enhance the quality and effectiveness of microspace design.

2.3. The Connection and Complementarity of Acupuncture Theory and Microspace Design

Acupuncture theory and microspace design share a certain connection and complementary relationship in urban planning and architectural design. Acupuncture theory, as part of traditional Chinese medicine, studies meridians, acupoints, and their impacts on bodily health. Microspace design, on the other hand, focuses on the detailed planning and design of small-scale spaces, aiming to provide a human-centered, comfortable, convenient, and safe user environment.

Firstly, acupuncture theory's meridian pathways can serve as references for microspace design. Meridians flow within the human body, transporting vitality and energy to different areas. In microspace design, the flow and pathways of meridians can be drawn upon to plan the paths and connections within microspaces, facilitating smoother and more natural movements for people within these spaces.

Secondly, acupuncture theory's methods of stimulating acupoints can be used to design specific elements within microspaces. Acupoints are specific points on the body with unique functions and effects. By drawing inspiration from acupuncture theory's methods of stimulating acupoints, specific design elements or strategies can be applied to microspaces to achieve specific effects, such as boosting vitality, promoting relaxation, or enhancing people's attention.

The complementarity of acupuncture theory and microspace design lies in their shared focus on human health and comfort. Acupuncture theory emphasizes the flow and balance of energy within the body, while microspace design aims to provide user-friendly, comfortable, and safe environments. By combining acupuncture theory with microspace design, it becomes possible to create designs that align closely with human physiological characteristics and fulfill people's needs effectively.

In conclusion, acupuncture theory and microspace design have a connection and complementary relationship in urban planning and architectural design. By drawing inspiration from acupuncture theory's meridian pathways and acupoint stimulation methods, microspace design can create environments that are more human-centered, comfortable, and functionally superior.

3. Elastic Design Practice of Microspaces in East Gate Street Alleys of Qingzhou Ancient City

3.1. Methods and Process of Elastic Design for Street Alley Microspaces

In the elastic design of microspaces within the East Gate Street alleys of Qingzhou Ancient City, it is essential to first determine the design objectives and fundamental principles. This serves as the prerequisite for formulating design schemes

and is a crucial factor in ensuring design quality and effectiveness. When determining design objectives, considerations must include the historical and cultural context, current state, future development trends of the area, as well as the usage needs and experiences of residents and tourists. Simultaneously, adherence to principles of sustainable development in ecological, economic, social, and cultural aspects is crucial for optimizing the layout and design of microspaces, enhancing the quality and vitality of the living environment.

Following the establishment of design objectives and basic principles, on-site investigations, analyses, and evaluations are conducted to gain a comprehensive understanding of various aspects of the area and to identify existing issues. During field research, factors such as historical and cultural significance, geographical environment, socioeconomic conditions, cultural characteristics, and functional requirements specific to the region must be considered. Through analysis and evaluation, insights into the usage patterns, flow designs, public facilities, landscape nodes, and spatial quality of street alley microspaces can be obtained.

The elastic design of street alley microspaces is a complex and comprehensive process that requires adherence to objectives and principles, in-depth analysis and evaluation, the formulation of scientifically sound plans, and practical implementation and evaluation. This process demands not only professional knowledge and skills but also multi-faceted coordination and collaboration to achieve optimization and enhancement of street alley microspaces.

Through comprehensive on-site research of the East Gate Street in Qingzhou Ancient City, several issues were identified. These issues include the distribution of pedestrian flow resembling a river dam due to conflicts between pedestrians and vehicles, resulting in a poor spatial experience. Furthermore, the historical significance and conservation importance of the sparse greenery distributed across the east-to-west space of East Gate Street were overshadowed due to insufficient attention to the relationship between vegetation and architecture. Also, the predominantly food and commerce-oriented East Gate Street experienced problems such as damaged buildings and a lack of distinctive spatial characteristics, leading to low spatial recognition and prominent spatial conflicts, resulting in traffic congestion at shop entrances, among other issues.

Given that East Gate Street is located in the central part of Qingzhou's ancient city, approaches like road expansion and large-scale demolitions, typical in modern urban renewal, are unsuitable here. Therefore, a more "light" approach of elastic micro-upgrade design is required, aiming to address issues in less efficient spaces through adjustment and renewal. This approach should focus on resolving street alley "pain points" and congestion points by unblocking certain nodes, ensuring smooth flow within the meridians, ultimately achieving the operational harmony of the entire system and organism.

3.2. Design Solutions for Different Scenarios

East Gate Street in Qingzhou Ancient City is one of the most bustling and important commercial streets within the ancient city and serves as the primary gateway for tourists entering the city. The design of microspaces within the ancient city, particularly street alley microspaces, directly impacts the city's image, user experience, and the sustainable development of urban spaces.



Figure 2. Comprehensive Research (Pedestrian Flow, Vegetation Distribution, Major Stops, Scale Relationships, Traffic Flow)

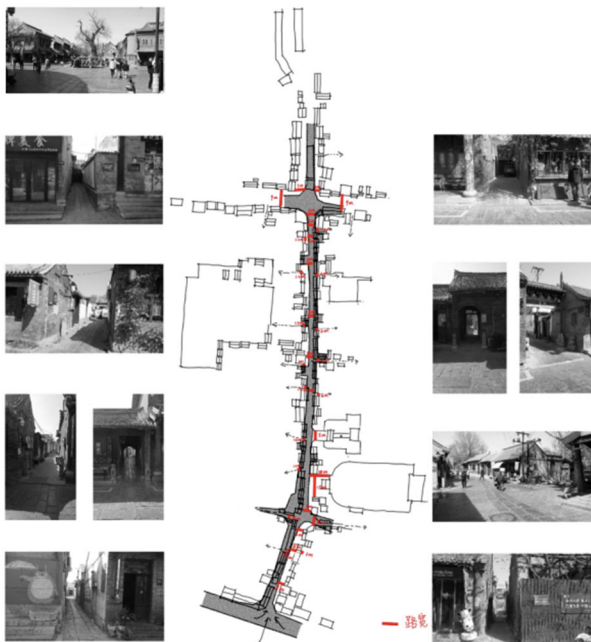


Figure 3. Spatial Experience Analysis

Design solutions tailored to different scenarios are pivotal in achieving elastic design for street alley microspaces. Firstly, an analysis and study of the usage patterns on East Gate Street in Qingzhou Ancient City is necessary. This includes factors such as peak pedestrian traffic times, characteristics of the primary user groups, and their behavioral habits. These considerations form the basis for functional and

morphological solutions for different scenarios.

Secondly, specific design solutions should be formulated for various types of street alley spaces. Different scenarios, such as small alleys, wide streets, and lanes, each require designs that cater to distinct usage needs and spatial characteristics. For instance, narrow alleys can use wall surfaces for unique artistic exhibitions, while broader streets can incorporate more green elements and resting facilities to enhance the overall quality of the neighborhood.

Consideration must also be given to the impact of seasonal and weather changes on street alley spaces. During hot summer months, measures like sunshades and water sprayers can be installed along the streets to provide a more comfortable environment. In spring and autumn, connecting multiple scenarios to create various thematic activities can enhance social interactions and engagement within the neighborhood.

In conclusion, different design solutions must be developed based on different scenarios, and their practical effectiveness should be assessed. Through continuous practice, the intrinsic value of street alley spaces can be further explored, ultimately achieving the elastic design goals of East Gate Street alleys in Qingzhou Ancient City. In all designs, the focus must remain on the sustainable development of the planet and the sustainable livelihood of humanity, contemplating how to promote balanced urban space development and green sustainability.

3.3. Reflections on Sustainable Development

In the practice of elastic design for street alley microspaces in East Gate Street of Qingzhou Ancient City, evaluating the actual effects of design solutions is of paramount importance. By assessing the practical effects, the feasibility, effectiveness, and impact on the city and its residents can be understood, guiding further improvements and optimizations.

Observing the usage patterns and changes in pedestrian traffic, as well as road conditions and shifts in transportation methods, is essential. A questionnaire survey was conducted among local residents to gain insights into their perspectives on street alley elastic design and their usage patterns.

During the practice of elastic design for street alley microspaces in East Gate Street of Qingzhou Ancient City, sustainable development is a critical consideration. Design solutions should focus on economic, social, and environmental sustainability to ensure the long-term benefits of design and their positive impact on urban development.

From an economic sustainability perspective, design solutions should prioritize the development of commercial activities and economic prosperity. By offering attractive and innovative microspace designs, business activities and tourism can be promoted, leading to increased employment opportunities and economic income. Additionally, cost-effectiveness should be considered to ensure the feasibility of design and operation, along with efficient utilization of economic resources.

Social sustainability considerations revolve around the well-being of residents and communities. Design solutions should emphasize social interactions, cultural heritage, and community participation to provide residents with a favorable living environment and community spaces, enhancing community cohesion and social connections. Furthermore, inclusivity should be a priority, taking into account the needs and interests of different groups to prevent social inequality and exclusion.

Environmental sustainability is a crucial factor to be considered in design solutions. In microspace design, attention should be paid to environmental protection, resource utilization, and ecological balance. Design solutions should address environmental issues such as energy conservation, emissions reduction, water resource management, and waste disposal. Sustainable materials and technologies should be employed to minimize negative impacts on the natural environment. Additionally, design solutions should encourage the use of sustainable transportation methods, reducing dependence on automobiles and promoting low-carbon modes of travel, such as walking, cycling, and public transportation.

In summary, sustainable development should be at the core of elastic design for street alley microspaces in East Gate Street of Qingzhou Ancient City. Economic, social, and environmental sustainability should be thoroughly considered in all aspects of design solutions to realize the long-term value of design and contribute to the overall sustainable development of the city. Achieving this requires collaboration between designers and relevant stakeholders to establish appropriate strategies and measures, ensuring successful implementation of design solutions in terms of sustainability.

4. Design Proposals

4.1. Diagnosis and Identification of Streets Requiring Activation Like Acupuncture Points

The ancient city, as an organic whole, is composed of physical structures and meridians. Meridians weave together to form an urban meridian network, which is analogous to the city's transportation network. Important urban nodes are distributed along these meridians, much like acupoints on the human body. This design is based on the theory of "urban acupuncture," seeking out pain points within the ancient city's meridian "East Gate Street" that require activation as "acupuncture points." These acupuncture points serve as the core for design analysis.

By simulating the paths of different population groups through route calculations, streets that require activation due to blockages in the "meridians" are diagnosed. Qingzhou Ancient City's East Gate Street is one of the most bustling and crucial commercial streets within the ancient city, serving as the primary gateway for tourists. The microspace design within the ancient city, especially street alley microspace design, directly impacts the city's image, user experience, and the sustainable development of urban spaces. Consequently, East Gate Street becomes the focal point of our design.

4.2. Identifying "Key Points" with Activation Potential on the "Meridians"

Based on on-site research and analysis of East Gate Street, we locate acupuncture potential points. Through field visits and surveys, we systematically examine courtyards and public spaces, documenting land usage conditions, and ultimately select sites and building clusters with renewal potential.

In the specific implementation of traditional Chinese acupuncture therapy, there are three acupuncture techniques: direct needling, oblique needling, and flat needling. Each technique corresponds to specific acupuncture points, and they vary in importance and impact, leading to differences in the stimulation intensity of surrounding meridian structures.

By specifically needling these acupuncture points, the goal is to establish a seamless connection of "meridians," ultimately forming a complete and tight network of spatial structures.

Direct needling in traditional Chinese medicine is mainly applied to the muscular layer of the human body, oblique needling is used for important organs and the semi-superficial and semi-deep layer of the body, while flat needling primarily targets the superficial layer of the skin. This design integrates these three needling techniques with urban spaces, transforming them into urban renewal methods such as replacement, implantation, and restoration. In urban renewal, replacement involves embedding new spaces and functions within old spaces and replacing old buildings and functions, primarily targeting underutilized or idle spaces with significant damage. This ensures the rapid clearance of blockages in specific areas. Implantation involves integrating new and old spaces, mainly addressing insufficient functions and low vitality in old spaces. This approach leverages synergies to achieve an effect where $1+1 > 2$, with minimal disruption to the existing space. Restoration primarily focuses on the external facades of urban spaces, ground pavements, or relatively superficial spatial elements with surface-level techniques that protect the original space while promoting repair and decoration to activate passive spaces.

4.3. Layered Acupuncture for Treating "Acupoints"

The "potential points" identified through diagnosis are matched with acupuncture techniques based on the severity of issues and compatibility with acupuncture techniques. Open spaces and vacant courtyards are treated with direct needling techniques, involving space replacement, including the creation of meditation spaces (exclusive rest stations), drawer-style gardens (street and lane lounges), three-dimensional parks, entrance squares, etc. Spaces with functional deficiencies and low vitality are treated with implantation techniques, emphasizing spatial integration and dissolution, involving the establishment of drawer-style dining bars, leisure pavilions, and leisure corridors, among others. Major attractions, greenery preservation, damaged building facades, and historical preservation areas are treated with restoration techniques, primarily focusing on spatial envelopment and parallel spatial relationships, highlighting cultural and ecological charm to evoke cultural emotions. Building facades, architectural exteriors, updates, and architectural decoration serve as vital nodes and hints for the entire street and guide people's activities and exploration.

Through the analysis of street alley microspace characteristics and environmental factors and by applying concepts from acupuncture theory such as "meridians" and "qi and blood," we extract design elements that can improve the neighborhood environment and enhance human health. These design elements will have a positive impact on the overall urban space.

Microspaces, as urban cells, play a crucial role in people's daily lives. Therefore, attention to detail and consideration of human behavior and needs are essential in the elastic design of microspaces to enhance the efficiency and comfort of urban spaces. The elastic design of street alley microspaces in East Gate Street of Qingzhou Ancient City is a universal design concept that can provide inspiration for the design of neighborhoods in other cities. This can promote sustainable urban development, improve the quality of urban spaces, and enhance the comfort of the living environment. The formation

of a systematic and complete culinary experience flow line allows tourists to experience East Gate Street freely, with opportunities for sightseeing, exploration, and tasting. The use of "empty" space as a spatial guide and visual navigation system allows participants to have a rich touring experience in the street alley. It can be fast or slow, with stops and variations in height, forming a connected meridian of the ancient city, ultimately achieving the benign development of the space. As Qingzhou is part of Weifang City and kite flying is a significant local folk cultural activity, the micro-updates in the ancient city emphasize flexibility and lightness. Drawing inspiration from the lightweight frame structure of kites, this element is introduced as a new element of acupuncture, activating the entire street alley and giving it a new appearance. The main structural components use wood joinery connections, and semi-transparent frosted fabric is chosen as the outer garment for the new element framework, which is embedded in the old street alley.

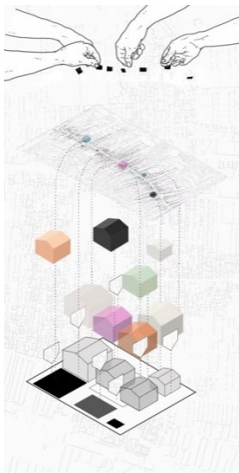


Figure 4. Relationship between New Structural Elements and Original Site

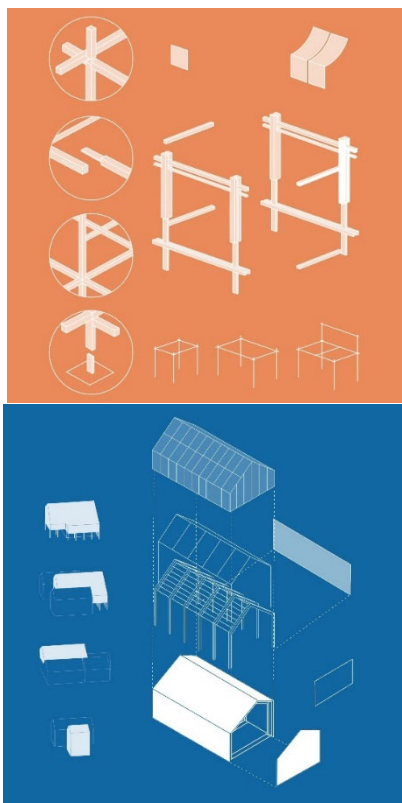


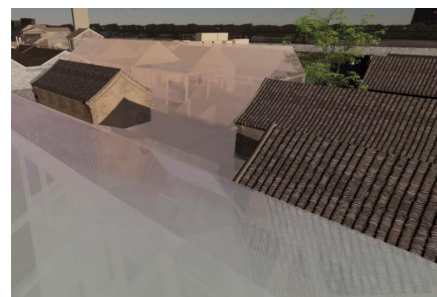
Figure 5. Structural Diagram of the Structure



Figure 6. Axonometric Analysis



Figure 7. Partial Effect Image



Supplementary Figure 8. Partial Effect Image

5. Summary and Prospects

In this study, we applied the theory of "acupuncture" to the elastic design of microspaces in the street alleys of East Gate Street in Qingzhou Ancient City and summarized practical experiences. We comprehensively considered the site's historical and cultural elements, emphasizing the preservation of traditional culture to enhance the design's alignment with the site's characteristics. Our people-centric design approach focused on residents' and tourists' needs, providing convenience and enhancing vitality. Various design techniques and technologies, including three-dimensional modeling and lighting design, infused modern elements into traditional architecture. Strengthening teamwork and communication ensured the design's quality and effectiveness. Applying the theory of "acupuncture" made our design more rational and scientific, addressing existing issues and enhancing functionality and aesthetics. For future development, we'll explore new methods, prioritize sustainability, and consider the environment. Usability and accessibility will be key to promoting healthy street alley microspace development and elevating the city's spirit. Regarding future directions, digitizing historical and cultural elements using big data and AI can aid in site maintenance and preservation. Spatial restructuring and traffic optimization in East Gate Street can promote urban development. Furthermore, exploring acupuncture theory's application in urban planning and its potential to optimize urban comfort and quality is crucial. Insights from advanced experiences worldwide can enrich our design concepts and capabilities, contributing international wisdom to Qingzhou Ancient City's development. In conclusion, future prospects involve digital management, spatial restructuring, acupuncture theory, innovation, openness, and inclusiveness. Combining global insights with Qingzhou Ancient City's historical context will provide unique value to street alley microspace elastic design and urban planning.

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