MINISTRY OF CULTURE AND STRATEGIC COMMUNICATIONS

KHARKIV STATE ACADEMY OF DESIGN AND ARTS

Faculty of‘ENVIRONMENTAL DESIGN’’

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Methods of Reconstruction of Public Spaces by Means of Landscape Design (on the Example of China)

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 ofideas, results and texts of other authors must be referenced to the appropriate source. Ma Xiao 数字签名者：Ma Xiao 日期：2025 11 19 00:17:02 +08'00' Ma Xiao (Mirri)

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Kharkiv-2025

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CHAPTER 4. CONCLUSION 50

Nowadays, many rural areas in China have problems with public spaces. The places are dilapidated and unused, old traditions are about to break, and each village is becoming more and more similar without its own characteristics. 51

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ABSTRACT

Mirri“Methods of Reconstruction of Public Spaces by Means of Landscape Design (on the Example of China)”

Currently, public areas in rural China need redevelopment, but they face two major problems: first, many places look very similar and lack unique features; second, traditional culture has been broken. To address this issue, we use Niutang Village in Wuxi as an example and carefully analyze it using the 'landscape gene' method. Then, we gradually improve it using the design approach of 'weaving and mending.' In this way, we can find a reconstruction method that is both scientific and true to local characteristics.

The research establishes a multi-level analytical framework of "gene information units - information points - information chains" to precisely identify the fundamental contradiction of "gene-rich but structurally fragmented" in Niutang Village's public spaces. Based on this, a "linking, empowering, narrating, and integrating" core weaving and mending strategy system is proposed, and the effectiveness of this strategy in integrating spaces, translating culture, activating industries, and restoring ecology is verified through specific node design practices.

The main innovations lie in: first, achieving the interdisciplinary transformation of the "landscape gene" theory from a cognitive tool to a design method; second, forming an integrated methodological system of "diagnosis -

weaving and mending", providing a systematic solution from problem identification to problem-solving for rural renewal.

This study not only expands the application boundaries of the landscape gene theory but also offers a replicable and scalable theoretical paradigm and practical model for how Chinese rural public spaces can maintain their cultural heritage and stimulate internal vitality in the process of modernization.

Key words: landscape genes; patchwork design; public space; Niutang Village; rural revitalization

CHAPTER 1. CURRENT STATE OF THE PROBLEM OF RECONSTRUCTION OF PUBLIC SPACES BY MEANS OF LANDSCAPE DESIGN AND RESEARCH METHODS.

1.1. State of international and Chinese research on the reconstruction of rural public spaces

As an interdisciplinary field, rural public space research traces its theoretical roots to the "public sphere" concept proposed by German philosopher Jurgen Habermas. The core idea of this theory is that even in public places, everyone's personal freedom should be protected. This viewpoint laid the foundation for later research. Nowadays, the concept of "public space" is not only discussed in sociology and philosophy, but also in fields such as architecture, landscape design, and geography. In this way, everyone's understanding of public space becomes more diverse and rich.

In the academic community of our country, the concept of "rural public space" originated from sociological research. Later, through the joint research of different scientists, a relatively complete theory was gradually formed. The rural public spaces we are studying this time include both the tangible places in the village and various activities that villagers do together.

Specifically, these places include the entrances of small shops where people meet on a daily basis, the courtyards of village committees, as well as outdoor spaces such as street alleys, squares, green spaces, riverbanks, and bridge entrances. And collective activities refer to various things that happen in these places, such as

annual temple fairs, doing farm work together, or daily interactions such as chatting and playing cards together.

The biggest feature of these places is their natural formation and rich vitality, which not only showcases the real living conditions of the villagers, but also continues the long-standing customs and folk beliefs of the countryside.

Domestic scholars have conducted extensive research from different perspectives. Regarding the evolution of rural public spaces, Wang Dong (2013) and colleagues developed a "coexistence-specialization-disconnection-separation" model based on the dialectical relationship between function and form, systematically tracing their developmental trajectory since 1949[1]； Wang Chuncheng (2014) and others, from the perspective of dynamic mechanisms, revealed the trajectory of "alienation-revival-decline-loss", and deeply analyzed the transformation characteristics of rural public space in different historical periods[2].In the study of influencing factors, Cao Hailin (2005) emphasized the key role of state withdrawal in the shrinking of public space[3].Scholars including Xue Ying (2014) conducted a systematic analysis of the combined effects of policy limitations and public awareness gaps.[4]Regarding the phenomenon of spatial contraction, He Lanping (2008) clearly pointed out the trend of holistic retreat[5]， Through empirical research, Gu Yuliang (2015) revealed the changes in public space accessibility after the "village-to-residential community" reform[6].Dong Leiming (2010) conducted an in-depth analysis of the resulting collective memory decline and ethical value crisis. When discussing how to revitalize rural areas,

several scholars put forward differing perspectives [7], Zhang Liang (2013) argued that the key is to encourage active public participation while fostering community organizations and promoting cultural prosperity[8]； Zhang Liang (2013) argued that the key is to encourage active public participation while fostering community organizations and promoting cultural prosperity[9]；Zhang Cheng (2018) proposed that rural communities can be jointly developed through multi-party cooperation involving the government, villagers, enterprises, and others, thereby improving living conditions and encouraging broader participation[10].

However, there are still three obvious issues with current research:

The research only focuses on the rural space of the past, neglecting modern development, resulting in an outdated and outdated approach that cannot keep up with actual changes;The study separated social factors (such as villagers' lives) and political factors (such as policy regulations) and did not explain how they influence each other;When discussing rural areas, only the general direction is discussed without delving into the internal structure (such as the organization of small communities) and daily dynamics (such as how villagers use space), lacking detailed observation of small places.Regarding spatial evaluation systems, Barbora Lipovska and Roberta Stepankova (2013) developed a systematic usability assessment framework through the lens of landscape design, providing a scientific basis for evaluating public space quality[11] ； Soszynski Dawid, Sowinska-Swierkosz Barbara, Gawryluk Adam (2016), and colleagues developed a landscape space evaluation methodology, providing actionable tools for the

transformation and creation of rural public spaces[12].In the field of empirical research, the team led by Agnieszka Jaszczak (2017) proposed an optimized community participation mechanism and a landscape project coordination method through case analysis of Poland's Rural Revitalization Program[13]； Dawid Soszynski and Barbara Sowi ska-Swierkosz (2021) employed a mixed-methods approach combining expert interviews, in-depth discussions, and fieldwork to demonstrate the vital role of public spaces in fostering community cohesion and their distinctive characteristics[14].In practical exploration, Ladislav Michalka (2017) focused on strategies for rural road space transformation, illustrating its characteristics and configuration methods through specific case studies[15]； Elizelle Juanee Cilliers and Selna Cornelius (2018) pioneered innovative planning for green, child-friendly spaces, offering regionally tailored solutions for public space development in rural South Africa[16].

There are many aspects of foreign research on rural public spaces that are worth learning from. These studies are not only more transparent and comprehensive in content, but also quite inspiring in research methods. Foreign researchers attach great importance to going to the scene to see and touch the situation, often using data from specific cases to analyze the problems existing in public spaces in a certain place.

This set of research methods is of great reference value to us. Its most outstanding advantage is that it can really involve community residents, promote the collaboration of experts in different fields, such as architecture, ecology and

sociology, and can make a very in-depth analysis of specific space. These valuable practical experience, especially when we study China's rural public space, is very worthy of reference.

In recent years, the research in this field has indeed made great progress. These achievements not only help us understand more profoundly how rural public space evolves from the theoretical level, but more importantly, they provide many practical new ideas and methods for the Rural Revitalization practice currently being vigorously promoted.Nowadays, rural revitalization is being vigorously promoted, and this type of research is particularly useful: it not only helps us see the changes in rural society, but also promotes faster rural development.

In the future, research on rural public spaces will have great potential. With the continuous development and revitalization of rural areas, these public spaces will play an increasingly important role in protecting culture, maintaining neighbors, and developing the economy. So researchers need to continue to focus on this field, conduct more research and practice, and contribute to the formation of our own successful model in China.

1.2. State of research on the theory of weaving and the theory of the landscape gene

Collage theory is a core method of urban renewal, characterized by both absorbing international experience and respecting local characteristics. The birth of this theory originated from people's reflection on the "large-scale demolition and construction" model after World War II.In 1961, Jane Jacobs criticized the single

function urban planning in "Death and Life in American Big Cities" and advocated the construction of compact and mixed communities, laying the foundation for collage theory[17].In 1967, John Portman proposed the theory of "urban weaving", emphasizing that urban elements should be integrated into a whole, and put it into practice in the Atlanta project[18].In 1976, Colin Lowe officially proposed the concept of "urban collage" in "The Collage City", advocating the use of collage techniques to restore the historical memory and spatial structure of cities[19].Afterwards, Transke further developed this concept in his works[20].Many scholars continue to deepen the theoretical connotation, while the renewal practices in cities such as Berlin and Paris have promoted the transformation of the patchwork theory from theoretical discussion to practical application.

Although China's research on urban renewal theory started relatively late, it has followed a distinct "importation-digestion-innovation" trajectory. Professor Zhang Jie from Tsinghua University pioneered the systematic introduction of urban renewal theory in China. He was the first to fully implement Western urban renewal concepts domestically and proposed three fundamental principles based on Jinan's ancient city conservation practices: strict control, density management, and spatial shaping. Subsequently, Chinese scholars continued to enrich the theoretical framework. Zhang Jie (2009) and colleagues further proposed four core principles of urban renewal, including "urban thinking," "open development model," "non-unitary fuzzy communities," and "high-density mixed-use development."[21];

Zang Jiaming (2010) proposed an embedded mending strategy, which deepened the practical approach through three dimensions: historical context, regional function, and spatial texture[22]； Liu Jiafu (2010) developed a three-tiered conservation framework of 'layout-environment-texture' for the preservation of Chengde's historic and cultural city[23]；In the Chongqing Shibanpo Area renewal project, scholar Mu Jian (2014) proposed a cultural-functional integration approach to urban renewal, advocating the coordinated development of cultural heritage and functional needs[24].In recent years, related research has demonstrated a trend of diversified expansion and deep integration. Zhou Kun came up with a new idea of "rural weaving", which focuses on the capital differences between different aspects such as tourism, daily life, and production work in traditional villages, as well as how to coordinate and cooperate with these aspects.Meanwhile, Professor Zhang Jie's research team developed an innovative technical framework for the cultural heritage protection of Jinan's "Quancheng" (Spring City), employing methods like "precise identification-dynamic monitoring" and "control-optimal allocation-enhancement".

Notably, the application of the patchwork theory has expanded from urban to rural areas, giving rise to three main research directions. In rural planning studies, scholars including Tang Hailing (2017) and Wang Zheng & Zhao Zhifeng (2016) have systematically developed a comprehensive framework of conservation and development measures for traditional villages[25][26]； In the field of rural landscape design research, Zhang Junjie and Li Fanmiao (2017) proposed a

patchwork strategy featuring local patching, horizontal integration, and vertical extension[27].Chen Yiqiao (2020) developed a 'three-pronged approach' of 'green patches, building component patches, and cultural patches' for urban renewal. In rural theory research, Zhou Kun and Wang Jin (2020) innovatively integrated the 'patchwork theory' with 'field theory,' introducing the novel concept of 'field-based patchwork.'[28].These studies have opened up new paths for the application of mending theory in rural areas, but they also show that the research on rural landscape design methods still needs to be deepened, especially in the combination with landscape gene theory.

The theoretical framework of landscape gene theory was established in the late 20th century and has since developed into a comprehensive system encompassing both theoretical foundations and methodological approaches. In China, the research in this field was first started by Professor liupeilin. He did a pioneering thing: he combined the concept of "gene" in biology with the practice of human geography. He was the first to put forward and explain the concept of "landscape gene", and regarded it as a key factor to identify why cultural landscapes in different regions are different. In particular, he pointed out that this "gene", like biological genes, has the basic characteristics of being replicable, inheritable and adaptable to the new environment. His research has laid the most important theoretical foundation for all subsequent related studies[29].How to identify and extract the "landscape gene" of a place? Later scholars developed a set of multi-dimensional and hierarchical methods. This method will comprehensively

analyze the overall layout of the village, the architectural characteristics of the dwellings, and even the commonly used architectural colors, so as to accurately find out the hidden "genes". Scholars such as Liu Peilin and Shen Xiuying have confirmed through typical examples of Hakka traditional villages that there is an inherent connection between landscape genes and cultural elements[30]； Hu Zuoshi and Liu Peilin also proposed a gene extraction method based on feature decomposition, followed by corresponding recognition patterns and technical steps[31]； Deng Yunyuan's team has built a systematic extraction framework of "point line network surface body", forming a complete landscape gene recognition system. Chen Qiuyu's team creatively used a quantitative research method that combines questionnaire surveys with SPSS software analysis, successfully identifying the cultural genes of communities in western Sichuan's forest areas, and enriching the research methods in this area[32].

In terms of theoretical research, Shen Xiuying and her team have applied the concept of "gene map" in biology in a new way and proposed related ideas, which has made landscape gene research both clear and more organized, promoting the development of this field of research.Liu Peilin proposed the "cell-chain-form" methodology for traditional village gene research, deepening theoretical understanding of village landscape structures[33]； Hu Zuoshi, Zheng Wenwu and others have realized the concrete application of landscape gene map in conservation practice through empirical research on traditional villages in Hunan Province[34].At the technical level, GIS technology has become an important

supporting tool. Hu Zui et al. explored the construction technology of settlement landscape gene information map[35]； Deng Yunyuan and others established the cultural landscape management information system of Fenghuang Ancient City[36]； Wang Bin and colleagues applied GIS technology to analyze the spatial distribution patterns of Paleolithic cultural sites in the Fujian-Taiwan region, thereby expanding the application of this theory in archaeology[37].

In terms of practical application, the landscape gene theory mainly presents three important directions. In the field of cultural heritage protection, Liu Peilin realized the quantitative management and digital preservation of traditional village cultural landscape by establishing the landscape gene identification system.[38]； Liu Tianzhao proposed the landscape information chain theory and applied it to the conservation practice of Xuanzhou Ancient Town[39].In urban and rural planning, Bi Mingyan employs cultural heritage conservation and adaptive reuse techniques to address the homogenization of landscapes[40]； Zhao Xianchao realized the continuation and inheritance of historical context in modern rural planning through gene screening and variation transplantation[41].In the field of cultural tourism, Liu Peilin put forward the theoretical point of view that the genetic information of landscape determines the image perception of tourist destinations, and constructed the restoration mode of landscape information chain[42]； Cao Shuaiqiang developed a GIS-based virtual tourism platform for ancient town landscapes, pioneering a new digital cultural tourism application model[43].

Although foreign studies did not directly employ the technical term "landscape gene," their research followed a similar theoretical trajectory. In 1978, scholar Rowe proposed that settlement spatial morphology evolves based on historical and cultural memory, underscoring the significance of cultural elements[44]；In 2016, Anderson explored the dynamic relationship between urban landscapes and social memory, proposing conservation strategies for memory carriers. In settlement studies, Taylor pioneered the use of genetic analysis to investigate the spatial morphology of settlements as early as 1942[45]； In 2000, Christopher Lawrence Warren created a settlement-specific landscape atlas through analogical analysis of DNA gene sequences. In 2016, Levchenkov proposed cultural landscape development strategies from a genetic perspective in the case study of Ningeer[46].Although these studies use different academic terms, they are essentially exploring the internal connection between landscape and cultural genes, and provide an important international academic reference for the theoretical research of landscape genes in China.

Current theoretical research on landscape restoration demonstrates three significant trends: Methodologically, the focus has shifted from single-material spatial restoration to multidimensional integration encompassing ecology, culture, society, and functionality. Technologically, digital tools like GIS and big data provide new support for precision restoration. Application-wise, research has expanded beyond urban renewal to broader domains including rural settlements, industrial heritage, and ecological rehabilitation. There is now a relatively

complete set of methods for landscape gene research. In the future, it is necessary to strengthen interdisciplinary and international cooperation, and utilize digital technology to coordinate ecology and culture, in order to better serve rural revitalization. These jobs can make cultural landscapes more sustainable.

The value of this theory is great. It not only promotes the progress of the discipline, but more importantly, guides us on how to balance the contradictions between "tradition and modernity" and "protection and development" in practice, and tells us what to do.

1.3. Innovations in research

This study has achieved innovation in three aspects: theory, methods, and practice.

On a theoretical level, we have developed a new framework called 'Landscape Gene Tissue Restoration'. Simply put, it is like using the perspective of "cultural DNA" (landscape genes) to "heal" (repair) rural areas, elevating the original focus on updating the physical environment to a holistic restoration and coordinated development of culture, space, and ecology. We have also established a 'landscape gene map', which marks a shift from only looking at the 'appearance' of rural areas in the past to deeply interpreting their internal 'genetic code', providing a new perspective and tool for understanding and reshaping rural public spaces.

At the methodological level, we have constructed a "point line network" design model centered around "landscape gene weaving". This method has clear steps: first, "diagnose" key cultural "gene points", then repair the "corridors" connecting them, and finally "weave" these point lines into a complete network. It has successfully achieved collaborative design across scales (from overall to local) and systems (taking into account space, culture, ecology, and function), transforming abstract cultural stories into concrete design strategies and solving the problem of scattered and unsystematic ideas in the updating process.

On a practical level, we have successfully combined universal methods with local characteristics to form a scalable practical paradigm. In response to the practical challenges faced by public spaces in rural China, such as cultural loss, ecological fragility, and tense human environment relations, we have focused on developing three major solutions: promoting the coordinated development of ecology and culture, precise micro transformation of high-density built-up areas, and revitalizing intangible cultural heritage. These strategies not only validate the feasibility of our theory, but also provide excellent replicable and promotable examples for the reconstruction of rural areas in China, forming a virtuous cycle from theoretical guidance to practical feedback.

Conclusions to the first chapter

The summary of this chapter points out that the main problem in the current construction of rural public spaces is the disconnect between theory and design.

We know where the problem lies, but we don't know how to make specific changes.

Our research combines two important theories - the "Weaving Theory" (emphasizing integration) and the "Landscape Gene Theory" (emphasizing culture) - to create a new method called "Landscape Gene Weaving", which is accompanied by a practical model of "point line network". This method is designed to ensure that cultural characteristics can be accurately reflected in spatial design, avoiding the abuse of "one village for a thousand" and cultural symbols.

Next, we will first introduce this method in detail, and then use the actual case of Niutang Village in Wuxi to demonstrate step by step how we went from analysis, planning to specific design, in order to prove that this method is both scientific and practical. We hope to provide a successful model for the construction of other rural areas that can be referenced.

CHAPTER 2. LANDSCAPE GENETIC INTERWEB. THEORETICAL INTEGRATION AND STRUCTURE DEVELOPMENT IN THE CONTEXT OF RURAL PUBLIC SPACE RECONSTRUCTION

2.1. Basic requirements for the renewal of the rural public space landscape

Revitalizing rural public spaces is like "strengthening the body" for the entire countryside, it is related to the comprehensive restoration of community relations, cultural identity, and development potential. This work directly addresses the issue of "hollowing out" of rural areas and the "loss" of public life, with the goal of transforming these spaces into the "community heart" of rural vitality.

To do this well, two key points must be grasped:

Firstly, we need to retrieve the concept of 'publicness'. Now that rural people have left and social relationships have changed, community cohesion is not as strong as before. So, revitalization is not just about building houses and squares, but about understanding the changes in rural relationships nowadays. What we need to do is to create a "rural living room" that can host various activities, so that people of all ages and genders are willing to come and can come; We need to preserve the collective memory of the past while creating new public activities to meet the spiritual needs of modern people. Make public spaces a powerful 'community magnet' that can once again captivate people's hearts.

Secondly, we need to preserve our uniqueness. Every village has its own "cultural background" and growth context, and the most feared thing is to be transformed into a "net red face" by a unified template. The task of a designer is to be a good "cultural translator", deeply understand the local natural environment, architectural features, and traditional techniques, and then express them in modern design language, rather than rigidly copying. At the same time, we need to use the "weaving" thinking of "threading" to connect the scattered public space points into an organic network. Only in this way can the "soul" of rural areas be preserved in development, avoiding the loss of cultural diversity and unique landscapes.

Thirdly, villagers should be allowed to become the 'managers' themselves. Rural public spaces serve villagers, and their vitality comes from their daily use. But many designs nowadays often exclude the real users - villagers. We must

completely change this approach by holding village forums, design workshops, etc., inviting villagers to participate in the entire process from planning to construction. This is not only a respect for their 'local experience', but also a 'capability training' for the community, which can greatly enhance everyone's sense of identity.If we want to do well in rural construction, the key is to let the villagers have the final say. Only when they nodded their approval, could they do it in a down-to-earth manner, and everyone would really like to use it.

Our ideal rural space must be "living" - the elderly can walk, the children can play, and the young feel interesting. How? First, don't use the word "dead" for places. For example, the square can go to the market during the day, dance in the square at night, and drink tea and play chess under the tree. Second, don't pave the concrete, but build the flowers, grass, trees and ponds as a jigsaw puzzle. Third, the government, enterprises, villagers and experts should discuss together and make their own efforts.

To sum up, the rural construction should grasp the three fundamentals: "sharing, characteristics and ownership".

2.2. Landscape genetic interweaving theory for public space reconstruction: strategies and concepts

This theory is like giving a "cultural examination" to the countryside.

The first step is to find out the unique cultural background of each village - such as the characteristic style of the old house and the traditional activities in the New Year Festival;

The second step is to repair these cultural roots with holistic thinking, just as traditional Chinese medicine regulates the body. It is not only a simple way to build roads and houses, but also to help the countryside find their soul.

Both theories recognize one truth. Development cannot cut off history. The good things left by our ancestors must be passed on.

Just like an old tree sprouting new branches, it is necessary to preserve the original trunk and roots, while also revitalizing the newly grown branches and leaves.Simply put, the theory of "landscape genes" regards each village as a unique life form shaped by both nature and history, emphasizing its inherent "genetic code"; The theory of 'organization' is like a meticulous' weaver ', focusing on how to repair broken spatial structures and rebuild their continuity. Both theories believe that rural transformation should respect local history and natural environment, and this common concept allows them to be well integrated.

The specific operation follows the complete process of "diagnosis intervention verification". Firstly, using the "landscape gene" analysis method, classify and sort out the various characteristics of rural areas: classify the active features as "main traits", such as the iconic old buildings in the village, regard the endangered old crafts as "urgently needed traits", and list the traditional elements that have been integrated into modern life but preserved as "evolving traits". This way, we can clearly know what to fix.

The specific method is like "symptomatic repair". First connect the broken spatial connection, repair the damaged area, and add new functions intelligently if

it is not enough. This not only preserves the cultural soul of the countryside, but also improves the quality of space. The whole working method consists of four steps: the first and most basic step is to conduct thorough research and carry out interdisciplinary cooperation. For example, experts in different fields such as architecture, geography and folklore should be combined to establish a detailed "village archive". This archive can not only record the visible buildings and streets, but also sort out the invisible cultures such as folk crafts, festivals and customs, and understand their internal connections, so as to lay a solid foundation for all subsequent work. The second step is hands-on implementation, mainly focusing on four aspects: first, to transform the physical space, focusing on improving the basic environment of the village; Second, revitalize the local culture; The third is to restore the ecological environment; Fourth, improve the function of modern life. These four aspects need to be taken into account in order to make the countryside glow with new vitality.

For example, restoring the traditional spatial pattern, connecting the scattered areas into a whole, while allowing the newly built parts to coexist harmoniously with the original style.

Cultural revitalization is committed to protecting and inheriting intangible cultural heritage, using modern design language to revitalize traditional culture in contemporary spaces.The core of ecological restoration is environmental protection and ecological restoration, including the construction of ecological corridors, restoration of local vegetation, and improvement of ecological infrastructure.

Functional enhancement focuses on the upgrading of industries and improvement of quality of life in rural areas, and revitalizes the space through reasonable functional configuration.

Finally, there is the intervention dimension, which promotes the comprehensive transformation of space from micro to macro through a gradual path of "point line network".

Priority should be given to renovating high-value nodes such as village entrance squares, ancient tree sites, and ancestral halls, making them the "spark" for activating the area.

Transforming a place cannot simply focus on a few isolated scenic spots, as it cannot become a climate. We need to learn how to "string beads into lines" first, focusing on repairing and connecting linear spaces like blood vessels, such as streets, small rivers, and walking paths. By smoothing and beautifying these 'lines', the bloodline of the entire place is connected. Next, these repaired "lines" will naturally connect various important "points" (such as squares, ancestral halls, and small shops), ultimately "weaving lines into a network", forming a well connected, easy-to-use, and sturdy overall network. This method of connecting points into lines and weaving them into a network ensures that the renovation has a global plan and does not require too many stalls to be laid out. It can steadily advance step by step, which is very practical.

But that's not enough, because building it is not difficult, the difficulty is how to keep it good all the time. So, the final crucial step of this method is to

establish a long-term maintenance and operation mechanism. For example, setting rules for daily cleaning, clarifying where maintenance costs come from, and even allowing new spaces to generate some revenue to support themselves. Only in this way can all the investment and efforts not be in vain, and the renovated countryside can truly continue to develop with vitality, rather than returning to its old state after a period of excitement.

In terms of multi-party collaborative governance, emphasis is placed on the joint participation of the government, market, community, and experts. By building an efficient collaborative platform and decision-making mechanism, the democratic and scientific updating process is ensured.

In terms of dynamic feedback adjustment, establish a systematic monitoring and evaluation system to promptly identify problems and adjust strategies, so that the entire update process can flexibly adapt to changes.

In terms of triple sustainable development, the long-term benefits of the project are achieved through the triple guarantee of ecological friendliness, economic self-reliance, and social harmony.

These four dimensions together constitute a complete methodological system from diagnosis to implementation, from material space to social ecology.

Simply put, the biggest advantage of landscape gene weaving theory is that it cleverly solves the conflict between "preserving tradition" and "promoting development" in rural construction.

It believes that revitalizing rural areas is not about going back to the past or completely abandoning tradition, but about truly understanding local characteristics, transforming traditional things in innovative ways, and adapting them to modern life. This is the key.

In the future, this theory needs to be tested and optimized in more places. The research focuses on whether it works in different regions, what methods can be used to more accurately evaluate the effectiveness, and how digital technology can be used to help. At the same time, it is necessary to better integrate research and policies so that they can be widely used to guide rural areas to achieve good and long-term development.

2.3. The Point-Line-Network Model

The "point line network" model is a core method that establishes a complete operational process from identifying cultural features to carrying out specific spatial transformations by systematically analyzing the landscape genetic information of a village. In this research field, there are already various methods for constructing gene hierarchies. For example, a method proposed by scholars (Zou Cheng et al., 2023) involves connecting basic units into chains to form a whole[47]；However, other scholars' models (Fischer Yan et al., 2024) focus more on how spatial elements are connected and evolved[48].We have created a three-layer working method of "Yuan Point Chain" based on the characteristics of water towns in Jiangnan. This method not only captures the essence of local culture, but also fully conforms to the transformation logic of "point line network".

Specifically, these three layers are as follows.

To find features (information units), first identify the most core cultural characteristics of the village, including visible ones (such as docks) and invisible ones (such as crafts and dances).

Identify specific locations (information points) for these cultural characteristics. For example, the place of pottery making is the Old Dragon Kiln.

Connect these culturally valuable locations along a certain thread (such as space or function) to form an information chain. For example, linking docks, waterways, and markets together forms a historical commercial line[49].

The "point line network" model corresponds one-to-one with the hierarchy of landscape genes. Identify cultural features (information units) and activate the corresponding points. Identify the connections between points, connect them into lines, and construct a skeleton. After multiple lines are formed, they are woven into a functional network.

This has transformed the transformation work from superficial to a process of showcasing rural characteristics from the inside out, which is both scientific and systematic. The first step in rural renovation is to "identify the true characteristics", which is the most crucial. Professional methods should be used, following the principle of "I have what others don't have, and I excel when others have", to screen out the most representative and core competitive characteristics of the

village, and to find these unique "core anchor points", such as an ancient tree with a story or an iconic old building[50].

Once these core anchor points are identified, we need to work together from four dimensions - space, function, culture, and ecology. In terms of spatial restoration, we should adhere to the concept of "minimally invasive intervention" and oppose large-scale demolition and construction. For example, using the method of "restoring the original form" to reinforce old buildings, and using the idea of "activating the community" to make the surrounding small environment clean and usable. By doing so, not only does it enhance the accessibility and aesthetics of the space, but more importantly, it re weaves and repairs the harmonious and symbiotic organic connections between waterways, roads, residential areas, and community life, revitalizing this place.

Culturally, it stresses "walking on two legs". We should not only protect the real things such as old buildings and old objects, but also inherit the stories and crafts behind them. The specific method is to turn these places of cultural value into attractive "cultural punch points" and "open-air history classes" by designing unique signs or developing them into scenic spots that can experience and listen to stories.

The key function is to "draw flowing water" to stimulate the development power of the village. Some demonstration projects with low investment and easy operation, such as community handicraft workshops and student practice bases, can be introduced first. These projects, like "drug introducers", can play a

demonstration and catalytic role, and slowly drive the upgrading of local industries.

Ecologically, it focuses on "gentle intervention" to minimize the violent fight against nature. Soft technologies such as restoring animal habitats and building gardens that can naturally penetrate rainwater are often used. Such a repaired place is not only a window to show the ecological concept, but also can actually improve the local environment.

In short, culture should attract people, function should support people, and ecology should nourish people.

The core goal of linear framework construction is to connect isolated cultural gene points to form a functional and meaningful overall skeleton.

In fact, the operation process of this method is very similar to that of traditional Chinese medicine, which stresses "diagnosis before prescription", and is divided into three steps. The first step is to "pinpoint acupoints", that is, to systematically identify and locate those key information points: first confirm what cultural stress it has, then analyze its actual use, and finally mark its specific location on the map. This step is very critical. It is equivalent to implementing the abstract cultural information into the specific entity space, laying a solid foundation for the follow-up "prescription". The second step is to "dredge the trunk", that is, to screen and determine the skeleton elements supporting the whole region. This must be based on the characteristics of rural areas and future development needs, and follow four principles: to be systematic, to be connected,

to be linked with culture, and to have practical functions. According to these principles, we select those linear spaces that can maintain ecological integrity and have development potential as the main framework of development from the ecological corridors, transportation lines, cultural context and industrial dynamic lines.

After the skeleton is clear, the third step - "activate the muscles and bones". We need to optimize and activate these skeletons through specific repair strategies. At the implementation level, the core is to achieve two goals: first, to achieve connectivity and integration in space, such as restoring spatial continuity and integrity by building slow-moving roads, repairing Street interfaces, and connecting scattered plots; The second is to inject vitality and value into the functions, such as organizing festival activities, connecting industrial nodes and improving public services, to stimulate the economic potential and social vitality of these linear spaces, so that they can truly become breathing and living "development arteries"; The third is to construct cultural narratives, injecting cultural connotations and identity recognition into physical spaces by creating themed storylines, setting up commentary facilities, and strengthening the unique atmosphere of the venue; The fourth is to ensure ecological connectivity by establishing blue-green corridors, restoring degraded environments, and opening up biological pathways to maintain regional ecological stability.

At the level of strategic thinking, the above goals are mainly achieved through three core strategies: narrative restoration strategy, weaving a cultural

storyline that immerses people in historical events and folk traditions as clues; Radiation based repair strategy, using high-value core points as engines, optimizes the spatial connections and functions of the surrounding areas, and forms a synergistic development effect of "capturing a point and driving a whole area"; The systematic repair strategy is the highest level solution, which coordinates all dimensions of space, function, culture, and ecology, with the goal of building a multifunctional and efficient composite network system.

Network coupling is the final step of the entire "point line network" work, aiming to integrate the four aspects of space, culture, function, and ecology from a dispersed state into a cohesive whole that can develop synergistically.

Firstly, it is necessary to understand how the various points are connected and thoroughly explore this network of relationships in order to know how to systematically integrate them.

Specifically, the integration work is divided into four parts. In terms of space, important points and lines should be connected to form a complete public space network. Culturally, it is necessary to string the points and activities with stories together into a cultural route that can be experienced. Functionally, scattered economic activities should be integrated to form a complementary industrial ecosystem. Ecologically, it is necessary to protect the core area, connect corridors, and establish an ecosystem with self-healing capabilities.

The foundation of all these jobs is people. Community residents must be involved and empowered to benefit in order for the project to be sustainable.

Throughout the process, we must keep in mind four core principles. We should look at the problem as a whole, not just focus on one aspect; Planning should leave room for adaptation to future changes; Try to minimize tinkering and use natural methods and local materials more often; Let the community take charge and combine the protection of culture with the improvement of their lives.This "point line network" method transforms complex cultural theories into a workflow that can be implemented step by step through the steps of "first point, then line, and then network".

The advantage of this method is that it can make the rural transformation not go to extremes - it can not only keep the charm of the old foundation, but also meet the needs of modern life. The cleverest part of it is the combination of scientific "gene" thinking and manual "darning" wisdom. This practical method, which is both justified and aesthetic, has really opened up a reliable new way for the protection and revitalization of the old village.

Conclusions to the second chapter

In short, the value of the "landscape gene weaving" theory proposed in this chapter lies not only in its advanced concept, but also in the fact that it provides a set of action guidelines that can be directly operated. This theory is based on a core cognition. A successful Rural Revitalization must achieve four points at the same time: space should be truly shared, characteristics should be clearly retained, villagers should be able to make decisions, and development achievements should be able to maintain for a long time. It is precisely because we have firmly grasped

these four fundamentals that our theory is not only an innovation in methods, but also a reliable path to guide practice and find a way to retain the "old taste" and live a good "new life" for the countryside. Retaining local characteristics is the cultural bottom line of spatial renewal, which can ensure that rural areas do not lose their cultural essence in the process of modernization; Encouraging villagers to actively participate is the implementation path of spatial renewal, truly reflecting the development concept of people-oriented; The ultimate goal of space renewal is to enhance the overall vitality of the space, so that the transformed space can function stably and effectively for a long time. The clarification of these four conditions not only accurately addresses the core issues in current rural renewal practices, but also provides clear direction for the construction of related theories in the future.

On this basis, this chapter also integrates knowledge from different disciplines and innovatively proposes the core theoretical framework of "landscape gene restoration". The reason why this theory is effective is that it truly integrates the two sets of theories of "landscape genetics" and "landscape restoration" - from the fundamental concept to the specific operational methods, it has formed a unified understanding.In terms of core values, both theories emphasize the need to respect historical backgrounds and protect regional characteristics; In terms of specific practices, the diagnostic methods of landscape gene theory and the intervention strategies of restoration theory are combined to form a complete set of operational procedures; In the ultimate goal, both are committed to achieving

sustainable development in rural areas and the inheritance of cultural heritage. This deep theoretical connection enables the theory of "landscape gene repair" to break down the boundaries between different disciplines and establish a unique research system.

The core achievement of this chapter is the "point line network" model, which is a practical rural construction method and an important breakthrough. It successfully links "cultural cognition" with "spatial design".

Turn cultural characteristics into key points to be developed. Transform the connections between points into lines to be connected. Transform the network composed of lines into a system to be integrated. This set of steps of "first point, then line, and then net" is both systematic and practical.

Its main contributions are threefold. Theoretical innovation: Through interdisciplinary integration, it provides a new perspective for understanding rural areas. Innovative methods have solved the long-standing disconnect between cultural preservation and spatial design.

Practical innovation can effectively solve the problems of "one size fits all", "scattered construction", and "unsustainability" faced by rural areas.The biggest breakthrough is a shift in mindset: from "transforming the exterior" to "repairing and activating the cultural genes within". This requires designers to understand both culture and design, and to be able to handle complex problems comprehensively.

Of course, this method still needs to be continuously improved in practice, such as whether it is applicable in different places and whether the operation process can be more standardized.

CHAPTER 3. PROJECT PROPOSAL FOR THE RECONSTRUCTION OF PUBLIC SPACES USING LANDSCAPE DESIGN (USED BY THE EXAMPLE OF NIUTANG VILLAGE, CHINA)

3.1. Pre-project analysis. Systematic identification of the “landscape gene” in the public space of Niutang Village

The identification of the "landscape genes" in Niutang Village adopted a systematic approach: first, a macroscopic understanding was taken, and then the details were delved into.

The specific work is to first understand the history and layout of the village through literature review, on-site visits, and chatting with villagers, and form a comprehensive landscape list as the basis.

Then, key genes are screened based on several core principles.Through the principle of extrinsic uniqueness, we identified landscape elements with distinctive morphological features such as the She Mountain topography and Eastern Han Dynasty dragon kilns. Screening key landscape genes based on two principles: one is' local uniqueness', which is used to identify locally unique core elements such as ancient ginkgo trees; The second is "overall advantage", which is used to assess the overall impact of the Taihu Lake Lake water system on the overall layout of the

village. In this way, the most representative genes were identified from a large number of elements.

A four-dimensional analysis system has been established to systematically classify and analyze genes from four aspects: environment, architecture, culture, and spatial layout. Multiple methods were used to identify the characteristics of Niutang Village from various perspectives such as shape, spatial layout, and cultural perception. The conclusions drawn from this approach are both accurate and lay a scientific foundation for subsequent design.

Overall, the appearance of Niutang Village is determined by its unique natural environment. It is located in a low-lying hilly area by the lake, resembling a bay. Guishan and Xueshan are not only landmarks, but also form a grand landscape of "turtle snake locking the river", which is very distinctive. The development of the village is closely linked to the nearby the Taihu Lake Lake, and the rivers in the village are also divided into different areas for different purposes. Economic crops such as Yangmei and tea trees are not only important sources of income, but also representative symbols of the local area.

The changes in history can be seen from the buildings in the village: from the earliest adobe houses and wooden houses to later modern architecture. The Dragon Kiln Site of the Eastern Han Dynasty indicates that people lived here during the Han Dynasty; The Zhutoudun site indicates that it was once a strategic location for military strategists; And ancient water conservancy projects such as Qilidi and

Guqiao not only prevent floods and facilitate transportation, but also become scenery.

These old traditions and crafts in the village are treasures handed down from generation to generation. They form the root of the village and deeply affect our understanding of our identity.

"Horse Lantern Dance", which is listed as an intangible cultural heritage, has become an important activity to closely connect people and inherit culture through its unique ceremony and clear division of labor. The old crafts of planting sweet potatoes and chopping firewood and burning bricks embody the wisdom of the older generation to adapt to nature and use local materials. The local temples and ancestral temples in the village are places where people place their spiritual beliefs, while those ancient place names record the long years of the village.

The layout of the village is very exquisite. The houses are naturally arranged along the mountains and waters, and are integrated with the surrounding environment. The natural landscape of "tortoise and snake lock the river" naturally separates the two villages, forming a classic pattern of "back to the mountain, facing the water". From the edge of Taihu Lake to farmland and villages, and then to the mountains behind, the whole scenic belt is an integral whole with distinct layers.

These distinctive places not only show the appearance of traditional villages, but also carry profound cultural memory. According to their importance, functional characteristics and geographical location, they are divided into three levels:

primary node, secondary node and background environment. These important elements, together with various small nodes, constitute the life network to maintain the cultural heritage of Niutang village.

In general, the village has four characteristics: the spatial pattern is spread along a narrow strip, surrounded by mountains and waters on three sides, and the ancient ginkgo trees and public activity space together constitute the overall skeleton of the village.Cultural stories connect the historical clues from the Han Dynasty dragon kilns to modern ruins. The evolution of production demonstrates the changes in economic functions from ancient land and water border defense to modern industry. The ecosystem has built a community where mountains, water, fields, and villages coexist harmoniously.

Integrating these threads transforms the static cultural characteristics of the village into a dynamic system. This has laid a good foundation for precise updates and renovations in the future.

3.2. Design concept for the planning solution of public spaces of Niutang Village

The main problem in the Niutang area is that there are many good resources, but they are managed separately and not connected. Specifically manifested in fragmented space, fragmented stories, single industries, and ecological barriers.

The solution consists of four steps. Connect and build a road to connect the main attractions; Revitalize the old kiln site into a pottery museum, transform the tea garden into an experiential park, and provide them with economic income; Tell

stories and distill local pottery, tea ceremony and other cultures into a complete brand story; Integration, breaking down the barriers between dams and villages, and integrating natural environment with cultural activities.

In design, the primary principle is to integrate space. We should focus on connecting various key nodes, filling in structural gaps, strengthening the core role of Qilidi, and making landmarks such as ancient trees and ancestral halls more closely connected to the surrounding area, forming a clear and complete spatial order.

Secondly, culture is not just an antique stored in a cabinet, it must be able to 'tell stories'. We can use these modern technologies to bring ancient relics like the Dragon Kiln to life - no longer just by looking at piles of bricks and soil, but by allowing people to intuitively see how it was fired back then, and even immerse themselves in the labor scenes of ancient people. In this way, those scattered historical fragments, such as a site, an old place name, or an old craft, are all connected together to form a coherent cultural journey that people can participate in, understand, and enjoy.

Thirdly, the ecology should be healthy and resilient. Maintain the health of the Taihu Lake Lake and the water system in a way that has little impact, integrate ecological facilities into the public space, and improve the ability of the region to cope with natural changes and self repair.

Fourthly, the industry needs to be upgraded. Upgrade traditional plum growing, tea making, and pottery to more profitable forms of tourism experience and cultural creativity, forming an endogenous development model.

These four principles support each other: space is the foundation, culture is the soul, ecology is the bottom line, and industry is the driving force. They jointly guide the update work.

In short, plan to use a systematic approach (linking empowering narrative fusion) to integrate dispersed resources into a dynamic whole. The goal is to turn Niutang into a new community with cultural heritage, ecological sustainability, and industrial development.

3.3. Design concept of the five main reference points of public spaces of Niutan village

1) Zhuudun Ruins

The renovation of the Zhangudun site is based on functional layout and environmental shaping, creating a place where one can immerse themselves in historical and cultural experiences. The entire venue is mainly divided into a military themed sculpture area, a three-dimensional column exhibition area, and a cultural corridor area.

In this area, different parts have their own emphasis: the sculpture area reproduces historical scenes from that year through groups of character statues; The pillar area uses three-dimensional carving to showcase important historical

materials and stories; The corridor area mainly systematically sorts out and displays the development process of local culture.

These areas are not isolated, they are connected by a unique semi enclosed glass flower tree pergola, which acts as a guide channel, slowly directing the flow of people towards a double layered viewing platform. This design combines the old tradition and the new style very well, so that the whole space is permeated with a cultural flavor.

A lot of effort has indeed been put into creating the environment. The most eye-catching thing is the landscape of ginkgo trees and lawns - the open green grass with tall and straight ginkgo leaves looks both atmospheric and quiet. At night, the lighting layout is also very particular, not only for lighting, but also for beauty: the floor lamp beside the lawn emits soft light and naturally gives directions; The warm yellow street lamp shines a circle of light and shadow, which not only ensures the safety of walking at night, but also makes the whole place look more historic. In this way, the entire venue will present different charm during the day and night, as if it can shuttle through time and space.

2) Ancient Ginkgo Square

It is mainly divided into three functions: a viewing area for everyone to enjoy ancient trees, a chat area with stone tables and benches for people to drink tea and play chess, and a stepped rest area built around the Millennium ginkgo tree. The plant arrangement takes the old Ginkgo biloba as the main character, and all kinds of flowers, plants and trees are planted around it, which looks like a painting.

At night, the purple ginkgo tree lights and the colored lawn lights are on, which are both quiet and lively, and well meet the different activities needs of residents during the day and at night.

The main purpose of designing this area is to inherit the tradition by reviving the culture. We have integrated the two characteristics of the local people "respect for nature" and "love to drink tea and chat" into our daily life. On the one hand, we continue to hold the old custom of "Qingming tea party", on the other hand, we have set up a "shady meeting place" to encourage everyone to communicate here. In this way, the ancient tree district can not only make people miss the past, but also become an open platform for handling current community affairs.

The idea of "intelligent puzzle" is used in the spatial layout, and scattered places are used. For example, three bluestone tea tables with checkerboard patterns are specially placed in the places where villagers often move, and equipped with stepped waterscape, which is beautiful and practical. All parts are connected by smooth paths, turning the quiet space under the trees into a shared space with rich levels and convenient traffic, which greatly improves the utilization rate.

Also very considerate in terms of ecology. The waterscape is equipped with a circulating purification system, which can adjust the local climate - in summer, it is cooled by water evaporation and plant transpiration. Permeable materials are used on the ground, and local plants are planted, so that rainwater can infiltrate and soil can breathe, and ecological restoration is realized in the small environment.

Finally, in terms of operation, villagers take turns to take charge of the "silver dust tea party", which not only attracts tourists to experience authentic tea culture, but also develops relevant cultural and creative products. In this way, a virtuous cycle of "using tea to raise trees and relying on reputation to promote culture" has been formed, which not only inherits the old tradition, but also brings sustainable economic vitality to the community.

3) **Community Pocket Park**

The small park in this community is centered on the original niutangwan pond, which skillfully combines ecological restoration and residents' activities. The design adopts the idea of "ecological puzzle", which not only governs the water body, but also collects and utilizes rainwater, and also takes care of the activity needs of the elderly and children of all ages.

The park is divided into different activity areas: a fitness area for playing table tennis, a children's recreation area, a lakeside promenade, and a rockery landscape. The greening and lake scenery are well coordinated, and various plants create a coherent landscape effect. At night, the underground light belt outlines the space contour, and with the lights on the trees, it creates a beautiful and well-defined night scene.

Ecological restoration is the biggest highlight here, especially the reconstruction of Niutang bay water body. The original hard cement bank has been changed into a gentle slope lawn, planted with Typha, reed and other local aquatic plants, forming a natural filter belt. This can not only purify rainwater, but also

provide habitat for aquatic organisms. The pond itself can also store water, which can be used in conjunction with other "sponge" facilities in the park - such as the drainage ditch with turf, which can collect rainwater from the fitness area, footpath and square, forming a complete ecological cycle.After initial sedimentation, it is discharged into Niutang Bay, achieving on-site utilization and recycling of rainwater.

A fitness area has been specially set up in the waterfront area. The ground is covered with high-performance permeable plastic, providing a comfortable and safe feeling for the feet during exercise. Rainwater can quickly infiltrate on rainy days, reducing the amount of water on the ground. A wooden climbing frame pergola was built above, allowing plants such as wisteria to climb and create shade, creating a lush and green sports space. The low ecological guardrails around ensure safety while not obstructing the view of the lake scenery.

A permeable asphalt circular trail connects the waterfront fitness area, sunshade platform, and ecological observation point to form a complete leisure loop. The vegetation in the park is mainly composed of local plants, and a natural plant community that requires almost no maintenance and is conducive to the habitat of various small animals is constructed through the mixed planting of trees, shrubs, grass and flowers.

Overall, this design centers around Niutang Bay and successfully combines the fitness of the elderly and the play of children with pond ecological restoration and rainwater management. Transforming a vibrant community space into a "blue

sponge" that can breathe, purify, and store water. This is not only a great place for residents to exercise and get close to nature, but also an open-air classroom showcasing aquatic ecology, further enhancing the overall ecological function of Niutang Village.

4) **Clay Art Experience Hall**

This ceramic art experience center with the theme of "kiln fire rebirth" has a clear goal, which is to go beyond the traditional manual workshop mode and systematically revitalize the ceramic culture, related industries and the overall space of Niutang village. Its core idea is to use modern design techniques to turn the profound cultural connotation behind ancient kiln sites and ceramics into a real life scene that everyone can understand, participate and experience.

The center is clearly divided, including office operation area, hands-on experience area, rest area and work display area. Each functional area is clear, and it is also very smooth to walk. The decoration is featured by the integration of art paint, solid wood, metal, glass and other materials, and the overall atmosphere is full of modernity. The lighting design is also very particular. The creative exhibition area is mainly illuminated by the chandelier with a sense of design, and the embedded downlight provides uniform basic lighting, which is both practical and beautiful.

In terms of cultural heritage, its focus is to fill the gap between "dead cultural relics" and "living culture". Here is not only a static display of ceramic products, but also an immersive display that vividly presents the complete

production process of a ceramic from a mass of mud to the final product. In the ceramic art exhibition hall, visitors can watch every step of the craftsman's drawing, glazing and firing through the glass wall, making the traditional craft a live performance. At the same time, the digital display board and the story wall record how the dragon kiln of the Eastern Han Dynasty was excavated and the history of local pottery making, turning the whole space into a three-dimensional local history book that can be read while walking, and skillfully connecting the development of pottery making technology from ancient times to the present.

In terms of industrial development, the experience center has built a micro ecosystem integrating experience, creation and sales. It, together with the gulong kiln site and zhangdoudun site nearby, forms a complementary "Cultural Triangle". Tourists can personally participate in the production of pottery drums, and then take them to the repaired Gulong kiln workshop for firing. This deep immersive experience sublimates a simple ceramic activity into a cultural journey through time and space, which not only greatly increases the added value of the product, but also brings sustainable tourism income to the local community, and explores a new way for the modernization of traditional crafts.

The large-area glass curtain wall connects the indoor activities with the outdoor ancient kiln landscape, which is visually transparent. The ceramic landscape wall and art theme garden around the site extend the experience space to the public area, making the cultural heritage naturally integrated into the daily life of the village.

In terms of ecological and environmental protection, the project also implements the concept of sustainable development. Rainwater is collected through the green roof to clean the pottery and irrigate the garden; Use natural ventilation and daylighting to reduce energy consumption. Even the leftover clay from the production of ceramics will be collected and either provided to the community for artistic creation or returned to nature, forming an ecological cycle of "coming from the land and going back to the land", vividly reflecting the environmental wisdom contained in the traditional process.

5) Gulong Kiln Site renovation

The goal of the reconstruction of gulongyao ruins park is very clear, which is to turn this archaeological site, which has been silent for many years, into a vibrant cultural landmark. The core idea of the design is to use a set of systematic strategies to naturally connect the heavy historical heritage with the daily life of modern people.

In terms of cultural display, the design focus is to clearly present the development context of kiln civilization. It completely retains the structure of the Longyao kiln. At the same time, it skillfully uses the methods of archaeological stratigraphic section display, ceramic fragments splicing diagram, and firing process analysis diagram to turn professional archaeological knowledge into a space language that tourists can understand. The specially designed "time light and shadow Gallery" device completely simulates the whole process of kiln fire from ignition, vigorous combustion to final extinction through light and shadow changes,

so that visitors can intuitively feel the life rhythm of Millennium kiln fire, and inject dynamic and perceptible vitality into the static cultural relics.

In terms of ecology, the transformation adheres to the concept of "ecological healing". The site will be stabilized by consolidating the hillside and planting local herbaceous plants and ferns with developed roots that can consolidate soil and retain water. The original drainage ditch has been transformed into an ecological grass ditch, which can guide rainwater to the constructed wetland for purification. The fire-proof vegetation belt replanted along the kiln wall not only restored the firewood forest landscape required for kiln burning in history, but also promoted the protection of cultural relics and ecological restoration.

In terms of industrial functions, the park innovatively adopts the linkage mode of archaeological site visit and handicraft experience. After seeing the ruins, tourists can go into the nearby Pottery Workshop and experience pottery making under the guidance of the master. The park also launched a residence plan for ceramic artists to encourage contemporary creators to seek inspiration from ancient kilns and reinterpret traditional crafts with modern design. The supporting ceramic culture market not only provides a platform for the exhibition and sales of local ceramic products, but also feeds part of the profits back to the maintenance of the site, forming a virtuous cycle of self creation.

It is not only an open-air classroom for learning archaeological knowledge, but also a practical place for creative incubation, a display area for ecological restoration, and a spiritual belonging shared by community residents.Through the

multidimensional integration of culture, ecology, and industry, the park has revitalized ancient kiln fires in modern landscapes, providing a new path for the sustainable inheritance of historical heritage.

Conclusions to the third chapter

This chapter takes Niutang Village as the research object, presents in detail the specific path of reconstructing rural public spaces through landscape design, and extracts a complete set of theoretical methods. The research process gradually progresses along the logic of "understanding problems - formulating plans - implementing designs". The study first used the theory of "landscape genes" to conduct a systematic analysis of village public spaces, sorting out the characteristic elements and internal structure. The results showed that Niutang Village has many "gene points" that carry local characteristics, but the lack of effective connection between these elements has formed a "chain break" problem.Through the detailed diagnosis provided earlier, we have thoroughly understood the problems and advantages of Niutang Village.

Based on this discovery, our research proposes the core planning concept of "weaving and repairing".

Specifically, it is to seize the eight words of "connection, empowerment, narration and integration" to build the overall framework. Turn the abstract conclusions from the previous analysis into real and operable design strategies. We will systematically upgrade the entire village environment from the aspects of

spatial integration, cultural expression, industrial activation and ecological restoration.

Next, we will use this overall idea to focus on five key areas: zhangdun site, jiulongyao site park, ceramic art experience hall, community pocket park and ancient ginkgo square. The transformation of these places is not only to make them better, but also an overall plan. By making these five points echo and link with each other, we can optimize the spatial layout of the whole village and jointly create a strong cultural atmosphere.

To sum up, we finally found a set of clear and visible methods for the transformation of rural public space. Its core three steps are: "first find out the family background - then make overall planning - and finally carry out precise transformation of key points".

The purpose of this customized plan for Niutang village is not only to provide a blueprint for transformation. More importantly, through this overall design adapted to local conditions, it has actually solved the problems of "scattered cultural memory" and "dilapidated physical space", which are commonly faced in rural areas, and laid a very solid foundation for similar rural construction in the future.

CHAPTER 4. CONCLUSION

Nowadays, many rural areas in China have problems with public spaces. The places are dilapidated and unused, old traditions are about to break, and each village is becoming more and more similar without its own characteristics.

This study aims to address these issues. By combining the theory of "landscape genes" with the design concept of "spatial weaving", we hope to explore a truly suitable path for rural spatial transformation that is tailored to the local conditions. By establishing a theoretical framework of "landscape gene weaving" and constructing a multi-level identification system that includes gene information units, information nodes, and information chains, the cultural connotations hidden in rural spaces can be systematically interpreted. On this basis, collaborative governance is carried out from four dimensions: spatial organization, cultural inheritance, industrial revitalization, and ecological restoration, forming a complete working method from problem diagnosis to implementation promotion, effectively avoiding problems such as construction formalism and cultural disconnection that are prone to occur in traditional renewal models.

In terms of practical exploration, a design scheme was constructed using Niutang Village as an example, which includes five core functional areas and a unique experiential space. Among them, the Zhandu Dun site presents a historical scene of "war drums and beacon fires" through modern technology, the Changyao Site Park revitalizes traditional pottery craftsmanship with the theme of "kiln fire rebirth", the community pocket park uses ecological puzzle techniques to create multi-functional public spaces, the ginkgo ancient tree area enhances community

cohesion through the "Silver Dust Tea Party" activity, and the waterfront leisure area reshapes the landscape characteristics of the water town through ecological restoration.

The specially planned ceramic experience hall is like a link connecting the past and present.

This project not only allows you to experience and pass on the old crafts, but more importantly, it deeply combines the traditional ceramic industry with new industries such as tourism and cultural innovation, creating new sparks and effectively promoting development.

The core innovation of this research is to build a set of rural renewal theory integrating multidisciplinary wisdom. During the specific work, we put forward the action mode of "point line network": first identify and activate the key points, then repair the lines connecting them, and finally weave a fully functional network. This set of methods can solve all kinds of intertwined problems in rural space step by step and systematically.

At the practical level, the specific model of collaborative development between the ceramic experience center and the five surrounding key nodes has been explored, which provides valuable practical experience for other rural projects that want to follow a similar path.It should be noted that due to the relatively single research case, the applicability of this method in different regions still needs further verification, and the long-term operation mechanism after the project is completed also needs to be further studied. The follow-up work will

focus on expanding in two aspects: first, applying this method to more different types of rural areas to test its adaptability; second, conducting long-term usage evaluations of completed projects and improving sustainable management plans throughout the entire lifecycle. Practice has proven that the spatial reconstruction model based on landscape genes and weaving thinking methodology can effectively meet the dual needs of cultural inheritance and innovative development in current rural construction, providing useful references for promoting rural revitalization.

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Appendix A:cases



Appendix A1. **The planning practice of Nanjiao Village in Weinan, Shaanxi Province has achieved the organic unity of ecological protection and functional requirements through landscape mosaic design techniques, while maintaining regional cultural characteristics.**渭南·南焦村：关中乡村微改造 / 西安建筑科技大学建筑学院等 - 有方




Appendix A2.**While promoting ecological restoration projects, Baiyanggou Village in Qilian Mountains, Qinghai Province has made industrial transformation an important development direction. By developing characteristic industries such as ecotourism, it attracts tourists to visit and experience, achieving a positive interaction between ecological protection and economic development.**龙鳞白杨林间的乡村公共空间营造，青海 / 中国乡建院 - docin.com 豆丁网






Appendix A3.**In the process of promoting rural revitalization, Sanhe Village in Shapingba District, Chongqing, regards landscape space transformation as a key lever and the concept of co construction and sharing. By optimizing the layout of public spaces, it helps the village achieve industrial integration and community coordinated development.**重庆日报关注 | 沙坪坝三河村：推进乡村建设行动 打造现代都市中的“诗意田园”_澎湃号·政务_澎湃新闻-The Paper




Appendix A4.**The landscape restoration project team of Dongximen Village in Tai'an, Shandong focuses on achieving an organic connection between industrial elements, cultural connotations, and spatial functions, creating a harmonious response between courtyard space and landscape architecture, injecting new vitality into this area.**十二个宅基地的新生：泰安东西门村活化更新 / 孟凡浩-gad • line+ studio - 有方

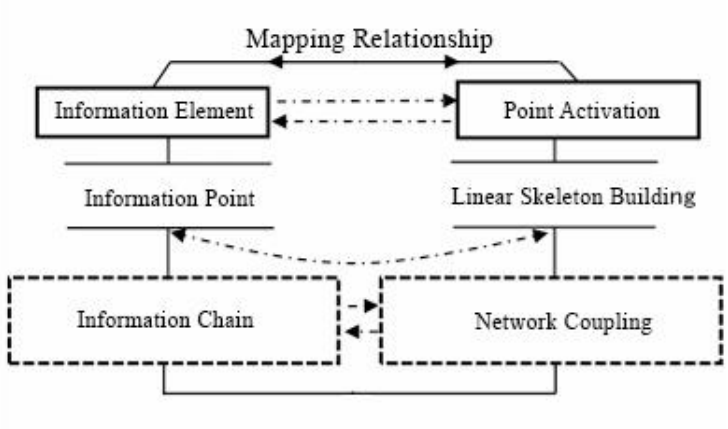
Appendix B:Public space reconstruction method analysis table

Reconstruction method	**MethodDescription**	**Application in this design**
Spatial Chain & Spatial Patch	**Diagnostic dimension:** Analyze the structural relationship between settlement spatial texture, pattern and sequence.	In the design of community pocket park and ancient Ginkgo Square, a cultural slow road connects multiple isolated nodes
	Patchwork method: by linking isolated gene points, the clear and coherent spatial sequence and	

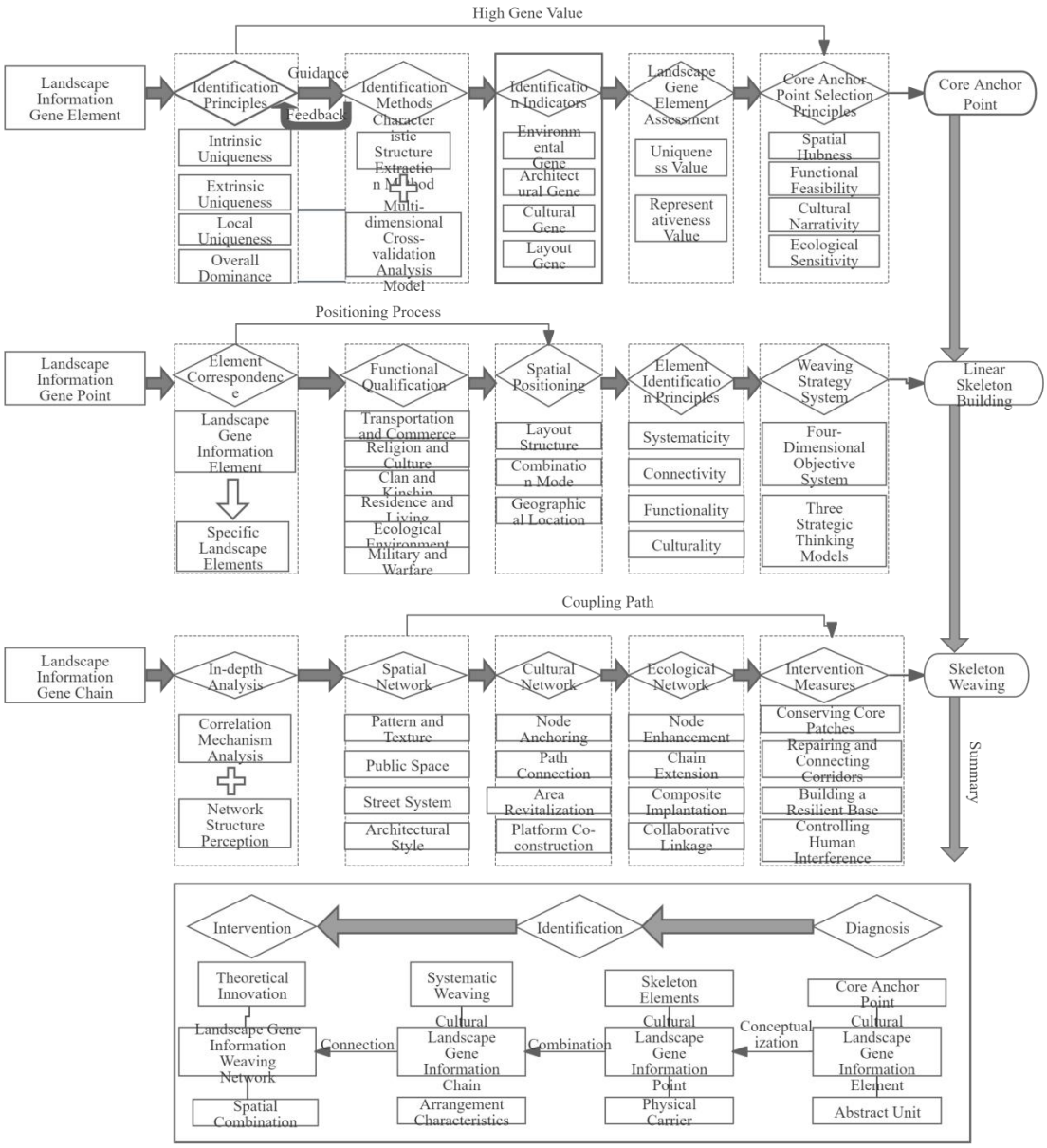
	structure are reshaped.	physically, restores the originally broken public space system and reshapes the village skeleton.
Cultural Narrative Chain & Cultural Patchwork	**Diagnostic dimension:** sorting out the spatial and temporal distribution and correlation of cultural elements such as local historical events, legends and folk customs.	At the Zhandudun site, the cultural wall and human statue sculptures of historical legends are set up to create an immersive narrative scene, injecting an immersive link into the cultural narrative chain and making the broken historical memory sustainable.
	Patchwork method: Construct a continuous and perceptible cultural experience sequence by translating and reproducing the implicit cultural genes.	
Livelihood Chain & Industrial Patchwork	**Diagnostic dimension:** trace the spatial carrier and functional evolution logic of traditional industries (agriculture, industry and commerce).	The function of the ancient dragon kiln site and pottery workshop is replaced, and study, experience and retail are introduced, so that the ancient "pottery" gene is integrated into the modern consumption chain and the contemporary value of the production and livelihood chain is activated.
	Patchwork method: Through design empowerment, the traditional production genes and contemporary business forms are integrated to cultivate new economic impetus.	
Ecological Adaptation Chain & Ecological Mending	**Diagnostic dimension:** Assess the integrity and health status of the"mountain-water-field-village" life community.	At the regional level, rain gardens were set up in pocket parks, ecological slopes were protected in Longyao ruins, and ecological infrastructure was systematically woven to replenish water, which strengthened the
	Mending method: Restore the ecological service function and resilience of the site through ecological restoration and green infrastructure.	

		ecological adaptation chain of settlements.
Acupuncture-style intervention (as a precision tactic for cross-chain repair)	As an efficient "patching" tactic, it activates nodes and triggers a chain of updates by implanting key catalysts.	In the Ancient Ginkgo Square, the "Xingtan Go Area" under the ancient ginkgo tree serves as the core acupuncture point, which stimulates the maximum community vitality with the minimum intervention and becomes the key catalyst to start the coordinated operation of multiple "chains".

Appendix C： Information hierarchy and patching hierarchy correspondence diagram

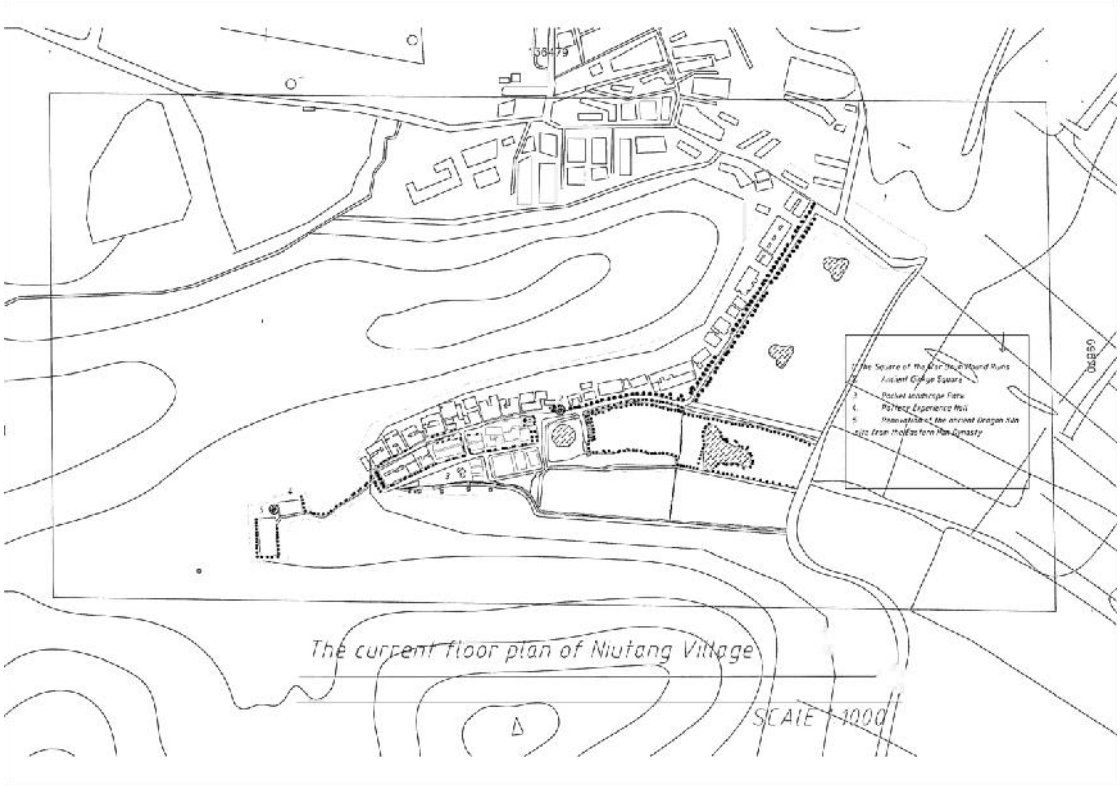


Appendix D：Traditional village landscape gene analysis and repair framework



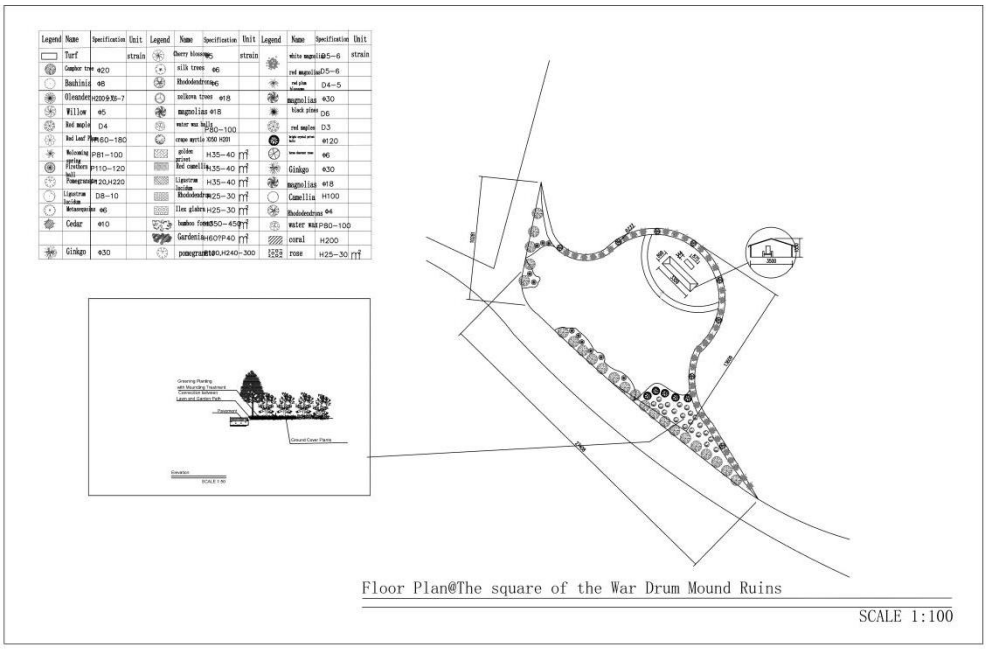
Appendix E：Design Drawing

1.1. Ningtang Village node design



1、The square of the War Drum Mound Ruins　2、Ancient Ginkgo Square
3、Community pocket park　4、Pottery Experience Hall
5、 Renovation of the ancient Dragon Kiln site of the Eastern Han Dynasty

2.1. The square of the War Drum Mound Ruins



2.1.1. Design concept

The plan is based on the particularity of the Zhan Gu Dun site, aiming to achieve the unity of protection and display. The building follows the terrain, with a circular glass

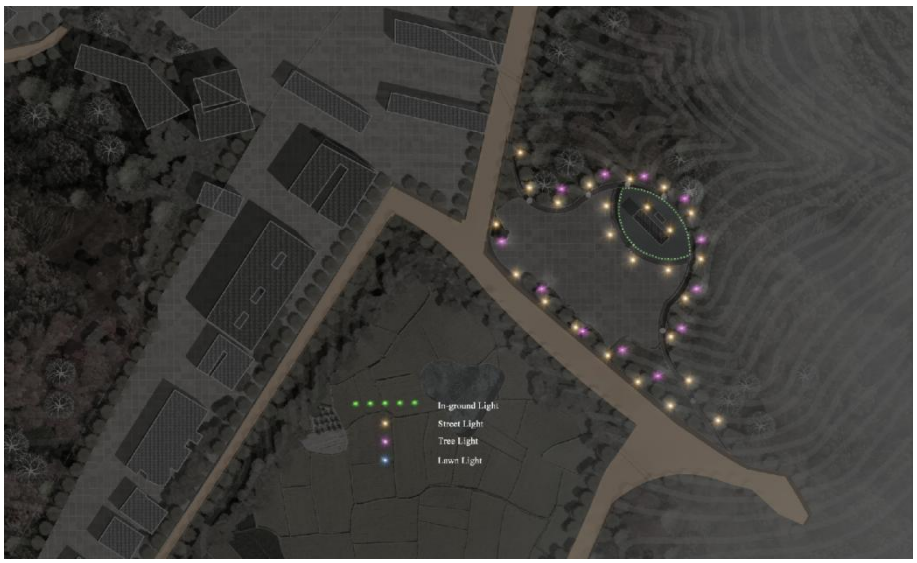
canopy of flowers and trees semi-surrounding the two-story high platform, supporting the restored War drum pier like a vessel, creating a solemn scene where the ancient and the modern blend and the grass and trees embrace.

2.1.2. Render the effect drawing（day and night）

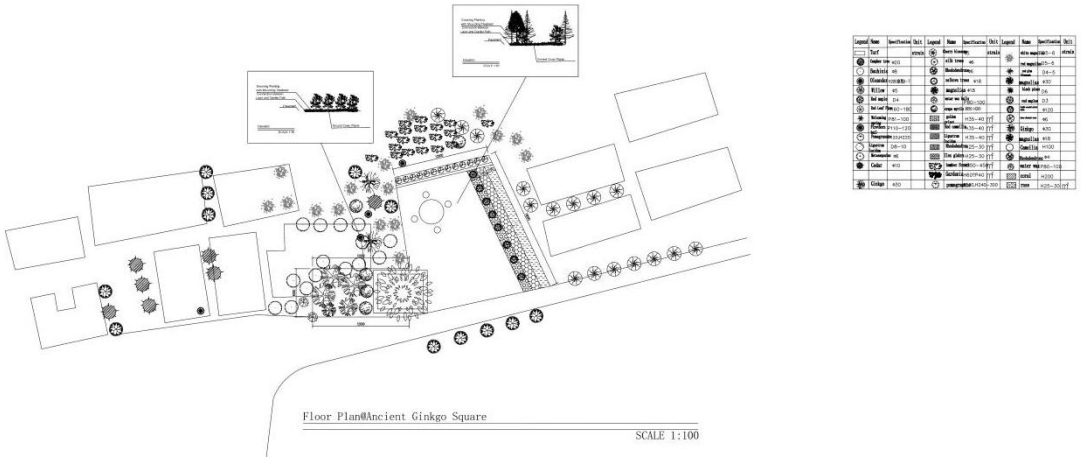








3.1. Ancient Ginkgo Square



3.1.1 Design concept

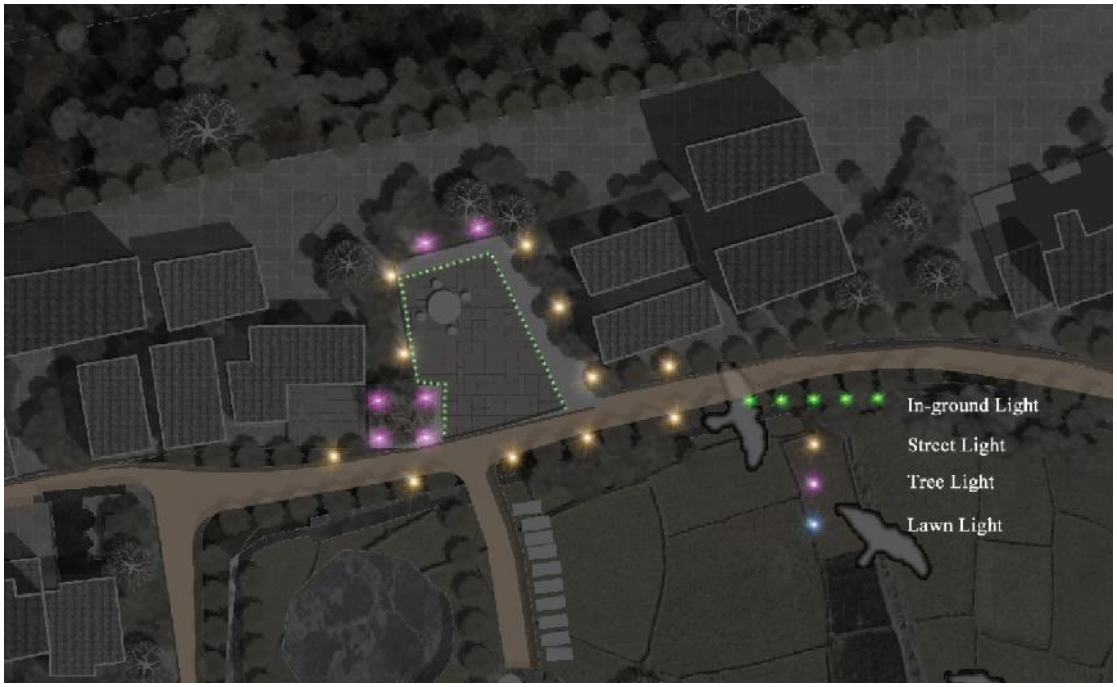
The design is centered around a 700-year-old ancient ginkgo tree, with the core being protection and tribute. A stepped water feature is set in the center of the venue, which serves both as an ornamental and a place for relaxation. At the same time, stone tables and benches are set up to provide a social space for the elderly to play chess and drink tea, and also to meet the needs of community activities such as Tai Chi fitness, creating a place where inheritance and vitality coexist.

3.1.2 Render the effect drawing（day and night）

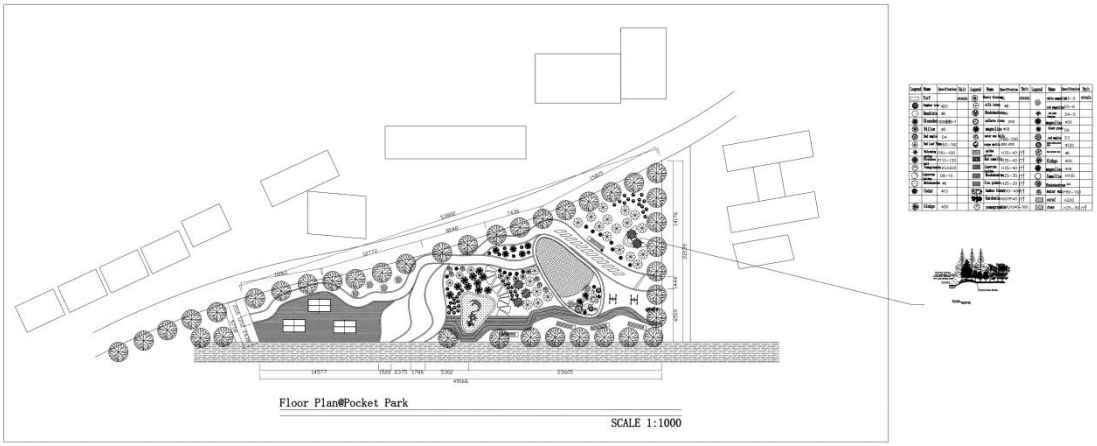








4.1. Community pocket park



4.1.1. Design concept

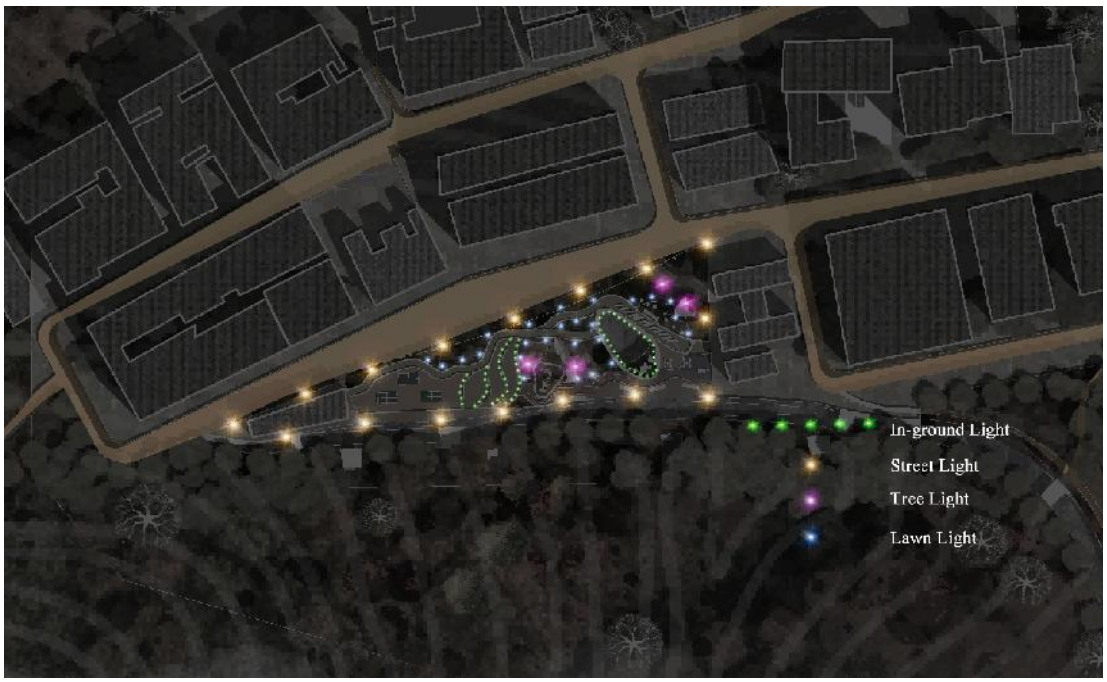
Design and build a multi-functional and composite community park. Set up ping-pong tables to meet fitness needs, demarcate child-friendly activity areas, and create green landscape walking Spaces. At the same time, by taking advantage of the lakeside scenery, a rockery scenic area and a leisure walkway are created to form a continuous landscape experience.

4.1.2. Render the effect drawing（day and night ）

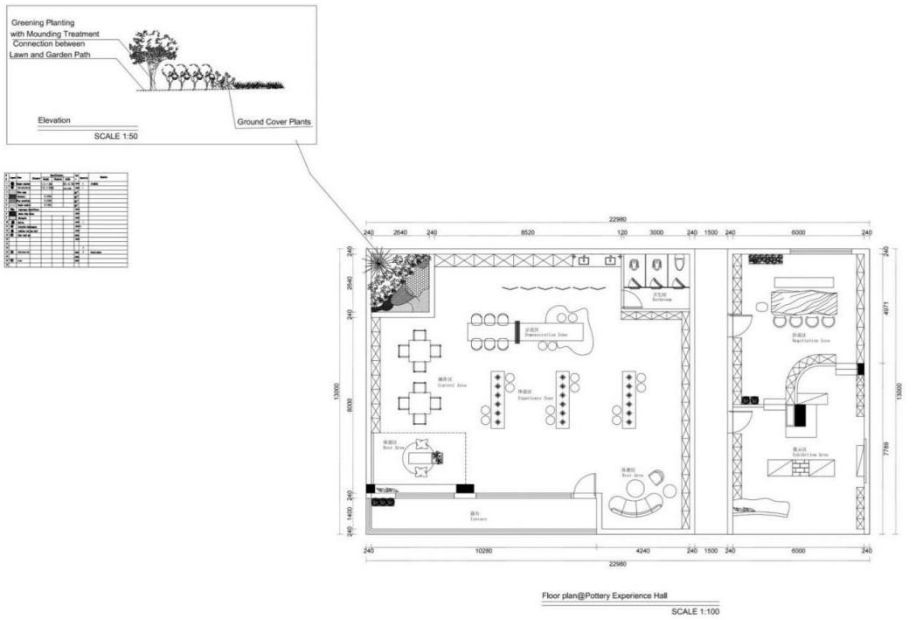








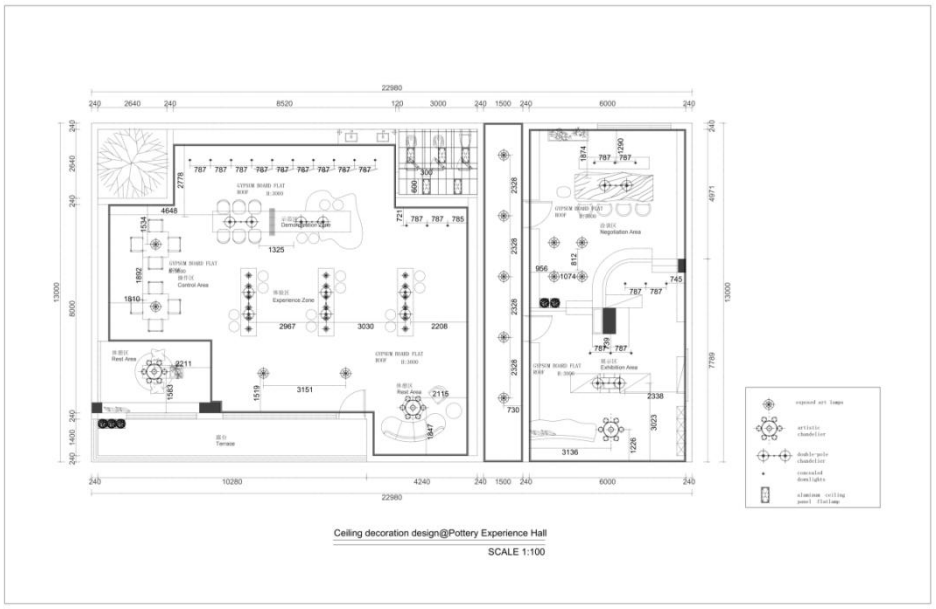
5.1. Pottery Experience Hall



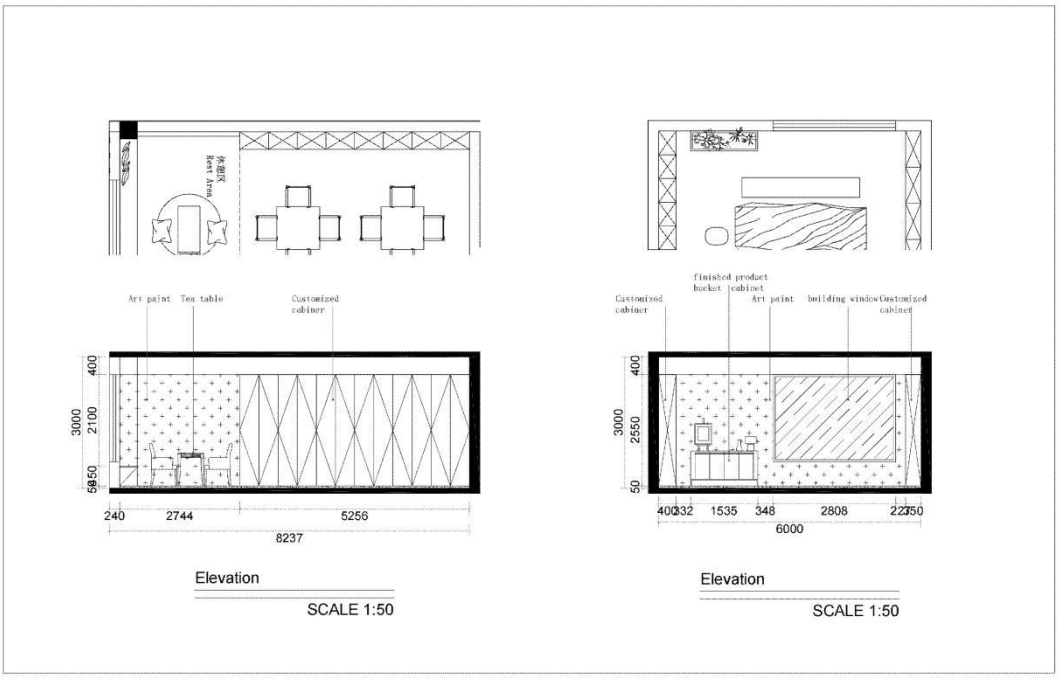
5.1.1 Design concept

This project relies on the dragon kiln ruins in the village to create an experience space integrating pottery making, cultural display and rest and negotiation. Visitors can experience the pottery-making process by themselves and immerse themselves in the culture of pottery. The venue is clearly divided into operation areas, demonstration areas, experience areas, rest areas and negotiation areas to ensure complete functions and smooth circulation.

5.1.2. Pottery Experience Hall：Ceiling design drawing



5.1.3. Pottery Experience Hall：Elevation drawing



5.1.4. Pottery Experience Hall：Render the effect drawing（day and night ）

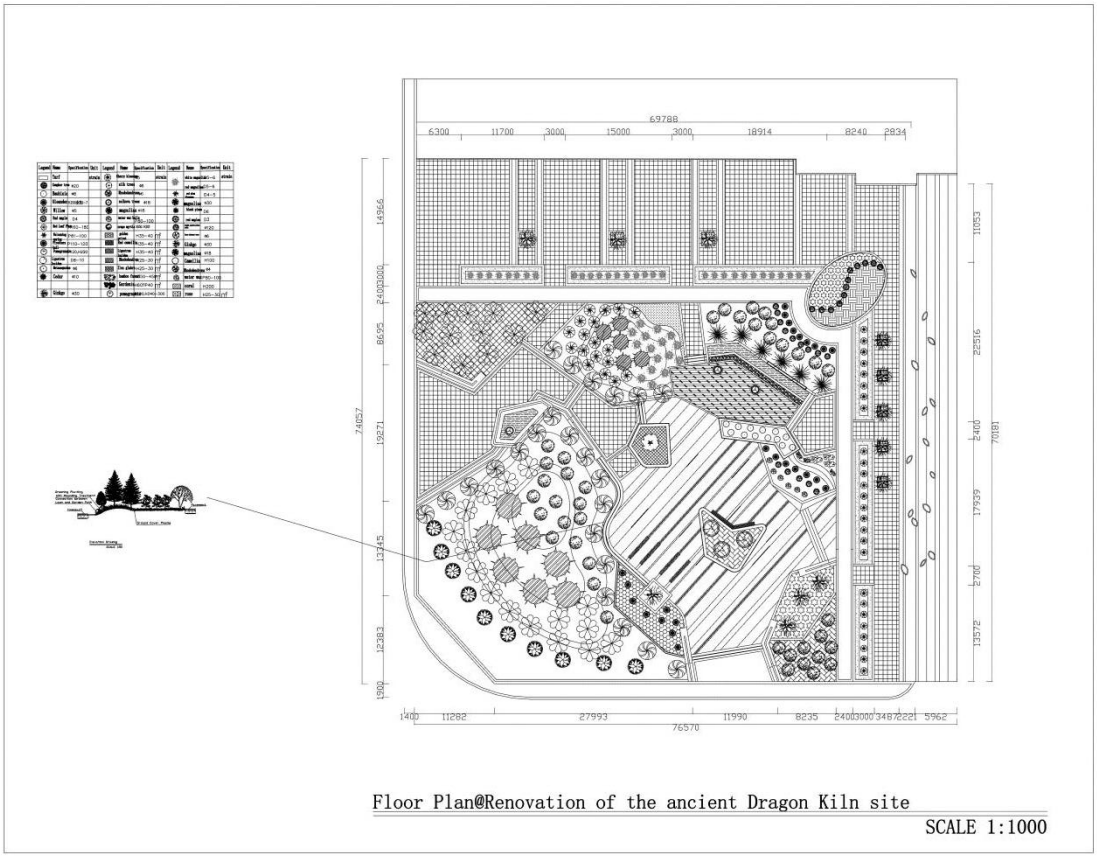








6.1. Renovation of the ancient Dragon Kiln site of the Eastern Han Dynasty



6.1.2. Design concept

This plan directly addresses the severe damage to the ancient Dragon Kiln site and aims to restore its cultural and educational value. Through the creation of greenery and winding paths, people are guided to appreciate the wisdom of ancient craftsmen and carry forward the regional cultural heritage amid the interplay of grass and trees and the exploration of twists and turns.

6.1.3. Render the effect drawing


















In-ground Light
Street Light
Tree Light
Lawn Light

Appendix F：Ground cover plants

Lation name	Local name	Flowering time (month)	Diameter of plant(cm)	High of plant(cm)	photo of plant
Reineckia carnea (Andr.) Kunth	Auspicious Grass	9-10	20	10-38	
sidenote:illumination(Semi-shaded),watering volume(Pay attention to keep the soil moist, pay attention to spraying water when the air is dry, and avoid direct sunlight in summer.),					
Centaurea solstitialis L.	Passing Yellow	5-7	20-60	30-90	
sidenote:illumination(Plenty of sunshine),watering volume(In principle, once a day is sufficient, but in the summer when it is drier, it can be watered once in the morning and once in the evening),					
Lavandula angustifolia Mill.	Lavender	6-7	0.2-1.7	3-15	
sidenote:illumination(It must not suffer from frost damage in winter and rot in the soil in spring),watering volume(Water 6~8 times a year according to weather conditions and soil moisture),					
Hosta plantaginea (Lam.) Aschers.	Hosta	7-9	1.5-3	40-80	
sidenote:illumination(Prefer shade and humidity environment),watering volume(During the growing season, the soil should be kept moist. Water frequently in summer, before 9 a.m. and after 4 p.m. If the temperature is low,					

the weather will be watered less or no on rainy days.),					
Hydrangeama crophylla (Thunb.) Ser	Hydrangea macrophylla	6-8	50-100	100-400	
sidenote:illumination(Semi-shaded),watering volume(It should be watered 2 times a day in summer),					
Vinca major 'Variegata' Loud.	Flower and Leaf Vine Changchun	3-4	0.7-4	2-15	
sidenote:illumination(Semi-shaded),watering volume(Water frequently),					
Oxalis L.	oxalis	3-12	5-30	10-35	
sidenote:illumination(Joyful sun),watering volume(Sprinkler irrigation, drip irrigation should be so that the soil is wet but not wet),					
Jasminum sambac (L.) Aiton	Jasmine	5-8	4-12	0-300	
sidenote:illumination(Joyful sun),watering volume(In summer, it is necessary to water early and late every day, and if the air is dry, it is necessary to replenish the spray water; During the dormant period in winter, it is necessary to control the amount of watering, if the potting soil is too wet, it will cause root rot or leaf loss.）					
Brassica oleracea var. acephala DC.	Kale	4	10-12	20-120	

sidenote:illumination(The growth temperature was 5 － 20 C),watering volume(Water 2-3 times a week in spring and autumn, 3-4 times in summer, and 1-2 times in winter.）					
Eustoma grandiflorum（Raf.）Shinners	Eustoma,Lisianthus	5-10	48	30-100	
sidenote:illumination(The growth suitable temperature is 15-28℃, and the nighttime temperature cannot be below 12℃),watering volume(More drought resistant, not water moisture resistance）					
Gentiana ornata (Wall. ex G. Don) Griseb.	Lilliflorae	5-10	0-2.7	10-15	
sidenote:illumination(Like cold and cool climate, have a strong cold resistance),watering volume(Strong drought tolerance）					
Ranunculus asiaticus L.	Persian buttercup	4-5	1-10	20-50	
sidenote:illumination(Sunny environment and cool climate),watering volume(Like moist, fear of water, afraid of drought）					
Cyclamen persicum Mill.	Cyclamen persicum	6	4-14	15-60	
sidenote:illumination(Love is warm, afraid of the heat),watering volume(After the hot summer, slightly water）					

Freesia refracta (Jacq.) Klatt	Freesia	3-4	0.3-1.5	15-40	
sidenote:illumination(Sex likes warm and humid environment, requires sufficient sunshine, but can not grow in strong light, high temperature. Suitable growth temperature ranges from 15℃ to 25℃),watering volume(Xiaolan growing period, the requirements of sufficient fertilizer and water, every two weeks to apply organic liquid fertilizer, can also be an appropriate amount of compound fertilizer）					
Gladiolus × g andavensis V an Houtte	Gladiolus gandavensis	7-8	2-4.5	40-80	
sidenote:illumination(Like warm, sufficient light growth environment, more cold, not high temperature,),watering volume(Not resistant to water）					
Canna indica L.	Largeflower Canna，India Canna	3-12	10（max）	150（max）	
sidenote:illumination(Like warm and humid climate, not resistant to frost, cold, fertility temperature 25-30℃),watering volume(During the growing period, water should be sprayed on the leaves 1-2 times a day to maintain humidity. Because canna is very fat and wet, so the basin should be watered to water.）					
Lilium brownii var. v iridulum Bak er	Lily	6-9	0.8-4.5	70-200	

sidenote:illumination(Like a cool, wet half-shade environment, more cold resistance),watering volume(In summer and dry season, increase watering frequency once or twice a week; in winter and wet season, reduce watering frequency, every 10 days to two weeks. Each watering should make the soil of the whole pot moist to avoid water.）					
Hyacinthus orientalis L. Sp. Pl.	Hyacinth	3-4	1-7	15-45	
sidenote:illumination(Above 5,000 lx),watering volume(The soil moisture should be maintained between 60% and 70%）					
Gardenia jasminoides J. Ellis	Gardenia	3-7	0.6-2.8	30-300	
sidenote:illumination(It likes a warm and humid climate and is more drought-tolerant. In the seedling stage, the shade grows well at 30%, but in the outcome period, it likes sufficient light),watering volume(Avoid water）					
Iris tectorum Max im.	Iris	4-5	1.5-3.5	15-50	
sidenote:illumination(Like warm, sunny climate, cold tolerance),watering volume(Strong drought resistance, suitable for semi-cloudy environment, like wet and avoid waterlogging)					

Lation name	**Local name**	**NO**	**Diameter of plant(m)**	**High of plant (m)**	**photo of plant**	**Number**

Punica granatum 'Nana' Pers.	Flower pomegranate	1	<1	1-7		10
Jacaranda mimosifolia D. Don	Jacaranda	2	>1.5	1-15		10
Osmanthus sp.	sweet osmanthus	3	>1	3-18		10
Cycas revoluta Thunb.	Cycads	4	200	200-800		20
Juniperus procumbens Sargent	Juniperus procumbens	5	75	200		20
Aucuba japonica var. variegata Dombrain	Japan Aucuba	6	5-12	8-20		20
Hypericum monogynum L.	Tutsan	7	80	100		30
Sorbaria sorbifolia (L.) A. Braun	Sorbaria sorbifolia	8	100-130	200		20

Pyracantha fortuneana (Maxim.) H. L. Li	Firethorn	9	50-200	300		20