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Landscape Optimisation Design based on the Concept of "Ming Tang" in Geomancy Science

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Abstract
This paper discusses the application of the concept of "Ming Tang" in modern landscape optimisation in Chinese geomancy science. Through literature review and case analysis, the application principles of this concept in modern landscape design are extracted, and the project is implemented. It is found that the concept of "Ming Tang" can guide the order of environmental space, increase cultural significance, optimize functional layout, and improve comfort. In addition, this paper also discusses the limitations of the concept of "Ming Tang" in modern landscape design, such as a lack of quantitative data support, cultural background differences, etc.

Keywords: Geomancy, Ming Tang, landscape optimisation.

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1.0 Introduction

1.1 Geomantic implication

Geomancy is a significant aspect of ancient Chinese culture, commonly referred to as Feng Shui in folk traditions. The term encompasses concepts such as Kan (representing celestial pathways) and Yu (symbolising tunnels). "Ming Tang," a key notion within geomantic practice, traces its origins back to the Zhou Dynasty; initially established for worshipping heaven and earth, it evolved into an essential component of royal architecture during the Han Dynasty and reached its zenith in the Tang Dynasty—serving primarily as a venue for imperial court meetings with officials, major sacrifices, celebrations, and large-scale events.

In contemporary contexts, "Ming Tang" has expanded into various domains including construction where it denotes areas before Yang or Yin houses that serve as gathering places for earth energy ("qi") or specific architectural forms; in Traditional Chinese Medicine where it refers to an individual's nose symbolising vital energy; additionally extending into religious and political spheres.

Within geomantic theory, Ming Tang signifies locations encircled by mountains where waters converge to foster vitality. A notable example is Wu Ze Tian's Ming Tang Paradise, which was constructed in Luoyang. It is a structure designed not only for imperial campaigns but also to reflect her political ambitions alongside innovative architectural designs. This grand edifice was characterised by

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circular formations both above and below; according to descriptions from the Book of Old Tang Dynasty, it soared to 294 feet (approximately 90 meters), epitomising peak architectural artistry during the Tang era, as illustrated in Figure 1 (Ming Tang Paradise Building).

1.2 Classic case

The integration of the traditional concept of Ming Tang with contemporary landscape design significantly contributes to enhancing living environments and improving the quality of life. Firstly, for users, the Ming Hall serves as a focal point for social interaction, infusing the space with vitality and dynamism. Secondly, on a spiritual level, Ming Tang embodies an aesthetic ideal that signifies achievement and success in endeavours. Lastly, from a landscape planning perspective, the relationship between Ming Tang and pathways transcends mere design; it also encapsulates formal beauty that reflects an aesthetic philosophy characterised by density and orderliness. The research objectives of this study are: to systematically investigate the cultural connotations and construction wisdom embedded in the traditional "Ming Tang" spatial morphology, extracting its core design characteristics to construct a theoretical framework; through empirical research with practical cases, to validate the translation mechanisms of traditional Ming Tang principles within contemporary landscape contexts, while exploring innovative application pathways for regional cultural heritage preservation and ecological landscape optimization.

Figure 1（From the network

2.0 Literature Review

2.1 Regarding the application of the Mingtang concept in modern design

The application of "Mingtang" in traditional architecture and landscape design is exemplified through several historical cases. Scholar Han Jianhua, in< A Preliminary Study on the Ming Hall of Wu Zetian in Luoyang, the Eastern Capital (2019)>, the Mingtang transformed the city into a legitimate national capital, serving as a ritualistic preparation for her political ambition to supplant the Tang with the Zhou. Scholar Li Ling, in< Research on the Restoration Design of Architectural Decoration of Ming Tang in Northern Wei Dynasty (2024)>, highlights the Mingtang's architectural uniqueness in terms of its distinctive forms and structural innovations, securing its pivotal role in the history of Chinese architecture. Characterised by its tripartite functional integration of Mingtang (ceremonial hall), Biyong (Imperial Academy), and Lingtai (Astronomical Observatory), this Northern Wei complex remains a critical archaeological and architectural reference among major Mingtang ruins. Similarly, scholar Su Song, in< A Study and Account of Wu Ze Tian's Mingtang (2015)>, emphasises the Mingtang's symbolic role as a cosmic interface where the emperor communicated with heaven. Its design embodied spatiotemporal ideologies such as the cyclical progression of seasons, the division of time into twelve shichen and twenty-four solar terms, and cosmological principles of a round heaven and square earth, all reflecting the unity of heaven and humanity. These conceptual frameworks profoundly influenced later imperial ritual architecture, particularly during the Ming and Qing dynasties. Collectively, these

studies underscore the Mingtang's dual role as both a materialisation of cosmological order and a tool for political legitimization across dynastic transitions.

2.2 The application of geomancy

The application of geomancy in traditional and contemporary architectural and landscape design is exemplified through interdisciplinary studies by scholars across multiple fields. Scholar Wu Yang et al. in <A Brief Analysis of Geomantic Principles in Chinese Classical Gardens: A Case Study of the Qingyi Garden(2023)>, explore how concepts such as "harmony between heaven and humanity" and "wind-sheltering and qi-gathering" informed classical garden design strategies, including site selection, landscape composition, vegetation arrangement, architectural placement, and scenic framing. They argue that these principles retain relevance in modern landscape design, offering theoretical guidance for balancing ecological and aesthetic imperatives. In< The Spatial Pattern Analysis of ZhuoZhengYuan Based on the Geomancy Theory(2020)>, scholars Xiao Qian et al. employ Form School and Compass School theories of geomancy to analyse the spatial configuration of the Humble Administrator's Garden. Their study posits that the garden's "qi-gathering" spaces—akin to magnetic fields in modern physics—permeate the environment and exert subtle physiological and psychological influences on humans. This interdisciplinary approach bridges traditional geomantic philosophy with contemporary landscape design, advocating for its scientific reinterpretation in spatial planning. Scholar Wang Jianting, in< Simulation and Optimization of Outdoor Wind Environment for Green Buildings Based on Geomancy Pattern Building science(2018) >, investigates the integration of geomantic principles into green building layouts. By employing computational fluid dynamics (CFD) simulations, his research demonstrates how traditional wind-environment optimisation strategies, rooted in geomancy, can enhance modern sustainable design. This methodology not only expands the theoretical framework of green architecture but also addresses practical challenges in energy efficiency and environmental harmony. Similarly, scholar Lu Jing, in< On the Application of Geomancy's "Qi-Gathering" Concept in Office Space Layouts(2017)>, adapts three core geomantic principles—"adaptation to local conditions", "mountain-backed and water-facing orientation", and "round heaven and square earth"—to contemporary office design. Her findings suggest that such principles improve spatial comfort, foster "third space" interactions, and enhance layout flexibility, thereby aligning functional efficiency with holistic well-being. These studies collectively underscore geomancy's enduring role as a transhistorical design paradigm, mediating between cultural heritage and modern innovation.

2.3 *Academic research on the concept of "Ming Tang" in ancient China*

The concept and evolution of "Mingtang" across historical periods and cultural contexts present distinct definitions and symbolic interpretations. In the Zhou dynasty, the Book of <Rites - Records of the Mingtang Positions(n.d)> delineates its classic representation as a ritual space in Chinese ceremonial tradition. This text microscopically explores its ritualistic dimensions, revealing embedded ideological constructs within the spatial arrangements of the Mingtang and their symbolic correlations with its architecture. It further examines how patterned narratives across three spatial strata facilitated the construction of a culturally meaningful space. The <Da Dai Li Ji - Mingtang Chapter(n.d.)>of the Han dynasty meticulously documents the architectural paradigm of the Mingtang, exemplifying both the artistic sophistication and technical proficiency of ancient Chinese architecture. This account simultaneously reflects the profound emphasis placed on geospatial orientation, ethical hierarchies, and spiritual cosmology in pre-modern society. During the Northern Wei period, <Shui Jing Zhu(2021)> provides a detailed description of the monumental Mingtang complex in Pingcheng, characterised by its colossal scale and intricate ornamentation. This structure uniquely integrated three ritual institutions—Mingtang (ceremonial hall), Biyong (imperial academy), and Lingtai (astronomical observatory)—into a tripartite unity, embodying imperial ideology and cosmic symbolism.The<Old Book of Tang - Annals of Empress Wu(2016)>records precise dimensional specifications and construction methodologies of the Mingtang erected under Empress Wu Zetian's reign. This architectural manifestation conspicuously articulated her political theology, synthesising religious authority (particularly Buddhist symbolism), imperial governance, and cultural syncretism within its spatial configuration. Each historical iteration of the Mingtang thus served as a materialised discourse on power, cosmology, and sociocultural order..

In summary, design philosophies based on 'Ming Tang' have endured from ancient times to modern practices without interruption. This study focuses on landscape design centred around main squares, analysing the current roles of 'Ming Tang' designs as well as their future prospects.

3.0 Methodology

3.1 Theoretical Analysis

This section delves into the philosophical connotations and spatial implications of the concept of "Ming Tang," providing a comprehensive examination alongside relevant theories in contemporary landscape design. In modern landscape architecture, the concept most analogous to Ming Tang is that of the "central square" or "core area." Key emphases include:

Spatial Centrality: Mirroring the placement of Ming Tang within architectural structures, central squares or core areas are typically situated at pivotal locations in landscape designs, serving as focal points for spatial organisation and visual guidance. Order and Symmetry: Contemporary landscape design frequently employs axes and symmetry to instil a sense of order, paralleling the symmetrical arrangement characteristic of Ming Tang's axis. Symbolic Significance: The central square or core area often embodies specific symbolic meanings, such as representing community cohesion or serving as an emblematic symbol for cities.

3.2 Case Analysis

Through an exploration of representative traditional architectural and garden examples, this section analyses how the layout influenced by "Ming Tang" shapes the overall space. For instance, Tiananmen Square in Beijing serves as a national symbol for China; its layout and function closely align with Ming Tang principles. The square's central positioning, symmetrical axial arrangement, and solemn atmosphere collectively reflect traditional Chinese architecture's emphasis on centrism and orderliness. Similarly, Chongqing Great Hall—situated in Yu Zhong District—exemplifies a modern structure that adeptly integrates traditional Ming Hall concepts with contemporary architectural styles. This building illustrates a harmonious fusion between Chinese cultural heritage and modern architectural artistry; its front space not only acts as a visual centrepiece but also functions as a gathering place for communal activities—a design approach rooted in traditional Chinese architecture's focus on central spaces.

4.0 Findings

4.1 Case introduction

This project implements the concept of "bright hall" within modern landscape architecture. As illustrated (Figure 2), this case pertains to designing a small landscaped park situated before an office building and teaching facility at a university college. The primary focus is on optimising both the square adjacent to the main building and various traffic routes throughout the park, including intersections along major thoroughfares and pocket parks. Key challenges include limited space around the main square which restricts its function as a central activity area; unclear internal road designs leading to chaotic site arrangements; visual obstructions at critical entry points; and disordered air flow patterns due to external factors necessitating phased implementation across three stages—with current efforts concentrated on optimizing "Ming Tang" features during Phase One.

Analysis reveals that prior configurations resulted in insufficient space for effective circulation or activities within what should serve as a focal point for community engagement—the central square was subsequently enlarged following integration with "Ming Tang," thereby enhancing its capacity for gathering energy "qi". Additionally, pathways were reorganised to clarify relationships between entrances/exits relative to major roads and squares, resultantly in streamlining traffic flows throughout these areas while embodying aesthetic values inherent to "Ming Tang" across all phases of development (Figure 3).

4.2 Parsing problem

Based on strategies for applying "Ming Tang" in optimizing landscape design for this case study, we propose principles guiding such optimization efforts. First is the principle emphasizing clear distinctions between primary and secondary elements; defining these locations is paramount, as it shapes overall park development around key features. Second is prioritizing hall placement—organizing space around a central square serves as an essential aspect of landscape architecture since it acts as a communal hub for visitors and constitutes core content within our design framework. Thirdly, there exists a classification principle wherein Ming Hall is categorized into small, medium, and large variants based on their respective distances from open areas.

This scheme's focal point lies at Zhong Ming Hall's location before the office building—a determination influenced by overarching design objectives. The configuration of Ming Tang should emphasize complete enclosure with smooth transitions across varying elevations while maintaining horizontal alignment; configurations adhering to auspicious forms are deemed favorable for successful implementation. Post-optimization assessments indicate that existing placements align well with these established principles.

Figure2 (Before the transformation, Author's drawing)

Figure 3 (after the transformation, Author's drawing)

5.0 Discussion

5.1 Summarize the problem

In the current research context, the concept of "Ming Tang" may have certain limitations in modern landscape design, such as the design principles in the scheme mostly consisting of the accumulation of previous experience. However, how can it be demonstrated in objectivity through data quantification? The list goes on. For example, how to evaluate the quality of the overall design? Maybe it's not just a questionnaire. The above questions need to be solved in the later stage of this project, which is also one of the differences between Chinese and Western design thinking.

Transverse comparison of other disciplines, the most representative of the traditional Chinese medicine culture of acupoint therapy, acupuncture treatment, bone therapy, traditional Chinese medicine decoction and other treatment methods, are very efficient and minimal side effects of treatment means, widely recognized by Chinese and foreign people. But it is currently impossible to explain how it works through other disciplines such as anatomy or chemistry. For example, the decoction most commonly used in Chinese medicine, the ingredients tested in the chemical laboratory are some trace elements and common substances, and can not even be listed as drugs. However, under the TCM system, each decoction has a different function, and even by increasing or decreasing the amount of the main medicinal material, it can become a new therapeutic prescription. There are many similar cases, but from the Western perspective, these lack the objectivity of data proof and existence.

5.2 Relation analysis

There are other influencing factors apart from the current research. There are significant differences in the application of the concept of "Ming Tang" in different cultural backgrounds. This design concept mainly exists in the design groups that recognize the Chinese cultural background. Even if some Western landscape or garden designs have similarities with it, most of them are coincidences, and there are essential differences in the way of thinking. Under the concept of Ming Tang, it is also necessary to consider the relationship between distance and location of its related space. For example, MingTang can be subdivided into "Big famous Tang", "Middle famous Tang" and "little Ming Tang" according to the relationship between distance and distance. According to the orientation, the surrounding area of the Ming Hall has been refined into "front Zhuque", "after Xuanwu", "left green dragon", "right white tiger" and other spatial environments. The root cause of the above classification method and the rationality of the data argument have not been shown or found in ancient Chinese classics.

5.3The design principle of this Ming Tang concept

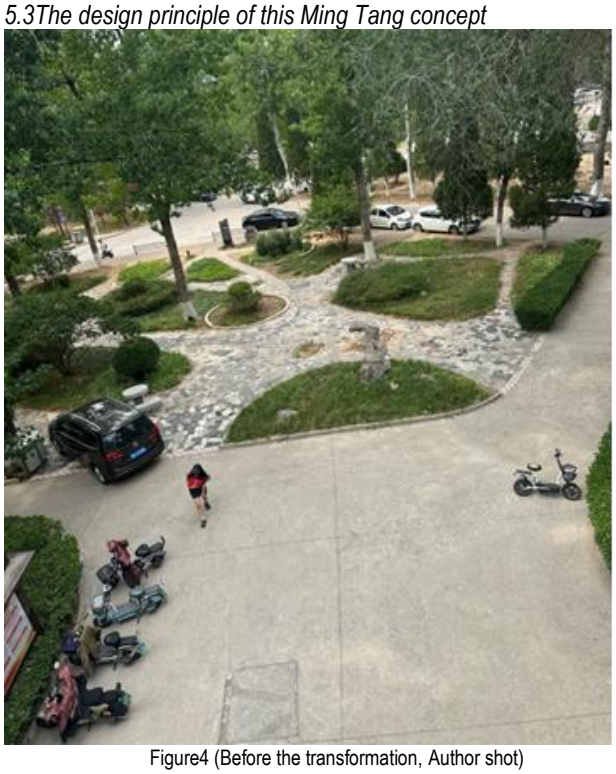

Figure4 (Before the transformation, Author shot)

Figure5 (after the transformation, Author shot)

The design principle focuses on gathering “qi.” The Ming Tang Square serves as both the visual and functional center of the layout, with all other functions developed around this focal point. This area is intended to attract large crowds, generating "popularity." In Chinese culture, a popular location signifies vigor and vitality, which also suggests prosperity, potential, and wealth.In this design, the southern building is designated as the office and teaching facility for a university or college. The original area was small (Figure 4), indicating insufficient capacity for gathering qi. The optimized design increases the main square’s area and enhances the views. This improvement signifies that teachers and students in this space will have limitless opportunities for growth and development.

Moral design principle. In Chinese culture, auspicious meanings are generally favored and even deliberately constructed, and their nature is similar to that of self-suggestion in psychology. The word "Ming Tang" mainly refers to the good hope of people in their careers, which means that their career is thriving and doing great things. Similar to "Persimmon Ruyi", "every year there are fish" and so on. In this case, the original Ming Hall is expanded, implying that all the personnel of the unit can achieve great accomplishments.

Function optimisation design principle. In this case, the principle focuses on the spatial relationship between the overall function and the surrounding area. The north side of the square is the intersection of a broken road and a slope road, which is prone to traffic problems. The crossing point is in front of the building entrance, and the original entrance is just nearby. Geomancy believes that the airflow here is chaotic, the brake is heavy and the balance is destroyed, and it is not easy to store wind and gather gas, increasing safety risks. Based on this, the scheme relocates the position of the entrance and exit, and conducts entrance treatment at the crossing points to block the chaotic air flow outside the courtyard and avoid risks in advance. (Figure 5)

5.4 Future expectations

In the optimization process of this project, only the computer was used to produce effects and size planning work. It is mainly based on the layout rules and taboos in geomancy. The design in this way mainly relies on a good understanding of the project area in the early stage, however, relevant quantitative research should be supplemented, which can temporarily serve as a bridge between Chinese and Western cultural and academic exchanges. Even so, the road to mutual translation of Chinese and Western cultures will take a long time to explore.

Through this research endeavor, I aspire to illuminate the historical foundations underpinning ancient Chinese design approaches while simultaneously seeking universal languages that connect cultures worldwide. Previous scholarly discourse has suggested an urgent need to establish cohesive communities centered around shared theoretical frameworks. This would foster a consistency of viewpoints and standardize methodologies, necessitating collaborative engagement from government and societal stakeholders alike, including esteemed academic leaders, teams, institutions, and resource networks.

6.0 Conclusion& Recommendations

There are several suggestions for improving research outcomes. It is concluded that the concept of "Ming Tang" plays a significant role in modern landscape optimization design, particularly within the context of Chinese culture. This concept can address specific design challenges. However, there are recommendations for future research. For instance, researchers should explore quantitative methods to validate the objectivity of "Ming Tang" and develop a clearer explanation of its design principles so that it can be effectively communicated to designers worldwide. Additionally, further investigation into the concept of "bright hall" in landscape design is needed, especially when integrating digital technology and quantitative approaches. There is also a need to translate numerous classical design cases based on geomancy into accessible design language. These topics should be explored through collaboration among more scholars.

Thanks to the academic exchange platform provided by this conference, the organizing committee has classified the topics in detail, which enables different studies to learn from each other. The completion of this study is inseparable from the support and help of teachers, classmates and friends. Here, I would like to express my most sincere thanks to Professor HARRY for his careful guidance and generous advice over the years. At the same time, I would like to thank Guo Che for her selfless help in data collection and literature sorting. In addition, thanks to the research platform and financial support provided by UITM, which has created good conditions for the smooth development of this research.

Paper Contribution to Related Field of Study

Through the practical research on the concept of "bright hall" in geomancy, the traditional geomancy theory is combined with modern landscape design, which provides a new perspective and case support for landscape optimization design. The research results not only enrich the theoretical system of landscape design, but also provide practical guidance for landscape design. The successful landing of this case indicates that the Chinese geomancy culture has important theoretical value and practical significance for improving the living environment and improving the quality of people's life.

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