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专业学位硕士学位论文

广州长堤大马路骑楼建筑形态特征及其形态管控研究

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Research on the Morphological Characteristics and Morphological Control of Arcade Buildings on the Long Bund in Guangzhou

A Dissertation Submitted for the Degree of Master

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摘　要

广州市内存在着数量众多的骑楼建筑，骑楼建筑往往并排建设，并且风格各不相同，由此形成了各具特色的骑楼街。广州的长堤大马路上有着一批广州近代优秀的骑楼建筑，但是近年来，长堤大马路在城市再开发中出现了新建建筑与传统骑楼建筑缺乏对话，传统骑楼文化衰落等现象，导致长堤大马路骑楼街的历史特色正逐渐消失。

而本文所使用的形态类型学方法，以城市元素随时间演变的视角，分析城市元素的形态演变规律，总结城市元素的形态特征，并制定相应的形态设计导则。该方法在分析过程中高度重视研究对象的历史特征，在实际应用中强调新建筑对历史特征的回应，其研究成果能为城市历史街区的保护与更新提供具有操作性的指引。

本文以形态类型学为理论研究对象，深入分析其理论背景，总结归纳其分析方法及工作框架，并通过案例分析总结该理论具体应用的操作及流程，构建该理论方法的本土化应用框架，并以理论方法应用于长堤大马路骑楼建筑为目的，总结场地骑楼建筑的形态特征，并对场地中骑楼建筑的更新发展提供建议。

本文共分六个章节，第一章绪论，阐述研究背景以及研究目的，并在理论层面对相关研究概念进行界定以及进行相关研究综述。第二章为基础理论研究，对该理论的基础概念进行介绍，具体分析形态类型学学派及形态类型学的发展脉络，总结形态类型学分析方法。第三章为形态类型学理论的应用以及实际操作手段的分析，进一步总结形态类型学理论的实际应用与城市形态的管理经验。第四章为本土化适应性研究，首先对形态类型学技术在国内的可行性进行研究，并对研究场地的限制及应用潜力进行针对性分析，得到适用于场地情况的本土化应用框架。第五章针对研究场地以及研究对象，运用形态类型学应用框架，对场地长堤大马路从民国到现代不同时间段内的建筑肌理，建筑形态，骑楼空间，道路断面进行历时性分析，总结出该场地城市元素的形态规律及特征。第六章，利用前几章的研究结论，对长堤大马路现有骑楼建筑按照形态特征进行分类，分别制定场地骑楼建筑改造更新的形态设计导则，最终对相应街道建筑界面进行详细的形态设计。

本文希望通过对于形态类型学分析及应用方法的研究，补充国内对于形态类型学研究应用方面的不足，同时在本土化研究方面提供一定的思路.也为长堤大马路的骑楼建筑

形态更新设计提供一定的建议。

关键词：形态类型学；历史街区；骑楼建筑；形态特征；形态管控

Abstract

In Guangzhou city, there are a large number of traditional arcade buildings, which are often constructed side by side and in different styles, resulting in the formation of distinctive arcade streets. There are a number of Guangzhou's excellent modern-day arcade buildings on the Long Bund in Guangzhou, but in recent years, the Long Bund has seen a lack of dialog between new buildings and traditional arcade buildings and a decline in traditional arcade building culture in urban development, which has led to the gradual disappearance of the historical characteristics of the arcade street on the Long Bund.

The typomorphology method used in this thesis, however, analyzes the morphological evolution law of urban elements from the perspective of the evolution of urban elements over time, summarizes the morphological characteristics of urban elements, and formulates corresponding morphological design guidelines. The method attaches great importance to the historical characteristics of the research object in the analysis process, and emphasizes the response of new buildings to the historical characteristics in the practical application, and its research results can provide operational guidelines for the preservation and renewal of urban historic districts.

This thesis takes typomorphology as the theoretical research object, analyzes its theoretical background in depth, summarizes its analytical method and working framework, and summarizes the operation and process of the specific application of the theory through case studies, constructs the framework of the localized application of the theoretical method, and aims to apply the theoretical method to the arcade buildings on the Long Bund, to summarize the morphological characteristics of the arcade buildings on the site .

This thesis is divided into six chapters. Chapter 1 is the introduction, which describes the background of the research and the purpose of the research, and defines the concepts of the research at the theoretical level as well as summarizes the relevant studies. Chapter 2 is the basic theoretical research, which introduces the basic concepts of the theory, specifically analyzes the development of the typomorphology school and typomorphology, and summarizes the analytical methods of typomorphology. Chapter 3 is the application of

typomorphology theory and the analysis of practical means, to further summarize the practical application of typomorphology theory and the management experience of urban morphology. Chapter 4 is a localized adaptation research, which firstly researches the feasibility of typomorphology technology in China, and analyzes the limitations and application potential of the research site, so as to obtain a localized application framework that is suitable for the site situation. In Chapter 5, the application framework of typomorphology is applied to the research site and the research object to analyze the building tissue, building morphology, arcade space, and Street Cross-section of the Long Bund from the Republic of China to the modern era, and to summarize the morphology and characteristics of the urban elements in the site. In Chapter 6, the conclusions of the previous chapters are used to classify the existing buildings on the Long Bund according to their morphological characteristics, and to formulate the morphological design guidelines for the renovation and renewal of the buildings on the site in terms of building tissue, building morphology, and building space according to the scale from large to small, and to finally carry out a detailed morphology design for the corresponding street building interfaces.

This thesis aims to supplement the deficiencies in the application of typomorphology research in China through the study and application of typomorphological analysis methods. It also provides insights into localization research. Furthermore, it offers specific recommendations for the morphological renewal and design of the shophouse buildings along the Long Bund.

Keyword：Typomorphology；Historic District；Arcade Building；Morphological Characteristics；Morphological Control

Content

Chapter 1 Introduction

1.1.Research Background

Currently, the global urbanization process continues to accelerate, with a large number of people migrating from rural areas to cities, leading to sustained population growth in urban areas. As a result, many old city areas in some cities are often facing issues of excessive overcrowding. Furthermore, due to the outdated infrastructure in these old city areas, they fail to meet the modern urban development needs. Consequently, redeveloping these old city areas has become a primary option for contemporary urban development strategies. However, these old city areas often possess a rich historical heritage and unique cultural value, requiring a comprehensive consideration of historical and cultural preservation in balance with urban development. China's current state of old city area redevelopment faces challenges of historical characteristics disappearing. The selected research site for this thesis, the arcade streets along the Long Bund in Guangzhou, is confronting similar difficulties.

Typomorphological studies have a long-standing tradition in Europe, focusing on the preservation and revitalization of historical urban morphology and the inheritance of traditional architecture and cultural heritage in urban renewal. With the acceleration of global urbanization, the contradictions in urban redevelopment for old city areas have become increasingly apparent. Consequently, the number of research articles related to typomorphological studies has significantly increased in recent decades, and conferences on this subject have seen a substantial rise, indicating the growing global interest in typomorphological studies. Meanwhile, in the past decade, China has also conducted extensive research on typomorphological studies, including summarizing the development process of European typomorphological studies and introducing classical typomorphological analysis methods.

This thesis focuses on practical issues, summarizes and extracts European typomorphological theories, attempts to construct a localized framework for the application of morphological studies, and explores the use of morphological methods in formulating urban morphology design guidelines.

1.2.Significance and Purpose of the Research

The purpose of this thesis is to apply European typomorphological research methods to the arcade streets along the Long Bund in Guangzhou. By comparing the development of urban morphology in China and Europe, and analyzing the practical constraints of the site, the research will employ typomorphological research methods in urban morphology to conduct typological analysis of the arcade buildings within the site. The objective is to summarize the morphological characteristics and evolutionary patterns of the arcade buildings on the site and derive guidelines for the morphology design of the arcade buildings.

1.2.1.Theoretical Significance

Typomorphology, a well-established research in Europe, has developed a mature set of analysis and design methods. It has been repeatedly applied in historic district preservation and urban design guidelines formulation in Europe. However, in the field of urban design research in China, the application of relevant theories is still lacking. As a mature urban morphology analysis research method, the use of this theory to analyze the unique arcade building morphology in China can provide new perspectives and viewpoints for the existing theories on historic building preservation and urban design guidelines formulation.

1.2.2.Practical Significance

Regarding the study of arcade, there are already a considerable number of domestic thesiss introducing its characteristics and origins. By adopting the perspective of typomorphology to classify and summarize the distinctive arcade morphology in China, it helps to deepen our understanding of this locally characteristic building type. The site applied in this thesis, the Long Bund in Guangzhou, is one of the famous arcade streets in the city, where numerous excellent Lingnan style historic buildings exist. This thesis also provides a set of arcade street morphology renewal design suggestions based on typomorphology, tailored to this specific site.

1.2.3.Purpose of the Research

Arcade, known as a type of building , constitutes Guangzhou's unique urban landscape. There have been numerous literature describing and classifying the building styles of arcade buildings, but research analyzing arcade architecture from an urban perspective is relatively scarce. This thesis attempts to approach from an urban standpoint and apply European typomorphology analysis techniques to the distinctive local architecture. It classifies and analyzes the Long Bund arcade street in Guangzhou, traces the development of arcade architecture, identifies its morphological characteristics, and summarizes a set of morphological criteria applicable to arcade buildings in this specific site.

1.3.Definition of Relevant Concepts

1.3.1.Urban Morphology

Urban morphology is a multidisciplinary research field that encompasses various disciplines, including urban planning, geography, architecture, sociology, and others. Therefore, it is challenging to find a common definition of urban morphology and urban form from the different morphological approaches of these disciplines.

In his introductory book "*Urban Morphology*" Vítor Oliveira refers to the definitions of urban morphology from various methods within the field. He attempts to summarize different concepts and proposes the following fundamental notions related to urban morphology: Urban morphology refers to the main physical elements that constitute and shape a city. Urban morphology is the study of urban form and the factors and processes responsible for the transformation of urban form[1].

In the book, four primary research methods in urban morphology are introduced: historical-geographical methods, process typology methods, space syntax methods, and spatial modeling methods. These methods help researchers analyze and understand the urban structure, layout, and organization of cities and the processes that contribute to their evolution.

1.3.2.Typomorphology

The historical-geographical school, originating from Conzen, and the process-typological school, originating from Muratori, in urban morphology have gradually moved towards integration in their respective theoretical developments[1]. Some scholars have combined the research methods of both schools, creating an approach that incorporates the characteristics of both. Since the 1990s, British scholar Karl Kropf has compared and integrated representative ideas and core concepts from Conzen's and Caniggia's theories, proposing a comprehensive Typomorphology research framework.

American scholar Anne Vernez Moudon explains the idea of urban morphology as follows: Urban morphology reveals the physical and spatial structure of cities by describing the urban form based on the typology of buildings. It considers all scales of urban landscape, from small rooms to large city areas. It views the city as a dynamic and ever-changing entity, focusing on the dialectical relationship between producers and residents[2].

1.3.3.Arcade Regulation

The arcade regulation is a building concept that emerged in modern Guangzhou, China, where urban administrators conceived and established it as a city management regulation for buildings on both sides of the streets. The arcade regulation, as a formal urban management regulation, began with the promulgation of the 'Regulations for Prohibiting Buildings and Implementation Details' by the 'Guangdong Provincial Police Department' in 1912. It defined the form and functions of the arcade buildings as a building regulation[3].

1.3.4.Arcade Building

In 1912, in Guangzhou, China, arcade buildings referred to constructions that met the requirements of the city's arcade regulation. Based on Article 14 of the "Regulations for Prohibiting Buildings and Implementation Details" issued by the "Guangdong Provincial Police Department," arcade buildings were defined as structures within privately-owned commercial land, reserving a designated width of space for pedestrian traffic. They were characterized by the upper part of the building being supported by columns, extending in a

cantilevered form at a certain distance, and closely aligned with the road interface.

In modern times the arcade space created through partial suspension has become a widely utilized architectural technique , and buildings with arcade spaces are not limited to commercial structures. With the changing times and the development of urban functions, the functions of arcade spaces have diversified, serving purposes such as leisure areas and exhibition spaces.

1.4. Theoretical Research

1.4.1. Theories of Urban Morphology

Nowadays, urban morphology mainly encompasses four research methods: the geographical-historical method, the process-typology method, the space syntax method, and the spatial model method.

The geographical-historical method was founded by British geographer Kevin Lynch. It aims to explain the geographic structure, patterns, and characteristics of human settlements through a systematic analysis of their constitutive elements and temporal development.

The process-typology method was established by Italian architect Muratori. This method emphasizes the historical development of urban organization and building typologies. It suggests that contemporary building types should correspond to their historical prototypes.

The space syntax method focuses on the geometric and topological attributes of building forms. Its objective is to understand the relationships between different attributes and measures of spatial configurations, how different spatial arrangements influence the urban environment and building use, and seeks to predict and improve functionality and performance.

The spatial model method primarily concentrates on human activities as collections of spatial interactions. This method utilizes a range of quantitative approaches, such as mathematical models, particularly based on entropy, fractals, and other nonlinear forms, agent-based models, cellular automata, graph theory, and network analysis.

These four methods highlight the investigation of different aspects of urban morphology[3]. The process-typology method and the geographical-historical method share a

common focus on the processes by which urban elements change over time. Consequently, scholars from these two approaches have gradually increased their exchange, leading to a fusion of their theories. In 1994, scholars from the process-typology method and the geographical-historical method, including WR. Whitehand, G.L. Maffei, A. Petruccioli, and A.V. Moudon, established an interdisciplinary international conference organization called the International Forum on Urban Morphology (IFUM). Its core aim is to connect and transcend disciplinary boundaries and jointly explore the concept of urban morphology and seek new understandings.

Currently, this interdisciplinary academic organization comprises approximately 300 members, including architects, planners, urban geographers, and historians focused on morphology research. Although the annual academic conference covers a wide range of discussions on urban morphology, the exploration of the relationship between urban morphology and building typologies or the connections between the Britain school and the Italian school and their implications for urban practice remains the central focus of this academic organization[4].

1.4.2.Foreign Typomorphology Research

Typomorphological studies are mainly divided into two schools: the process type approach of the Italian school and the historical-geographical approach of the British school.

Saverio Muratori is considered the founder in Italian typomorphological studies. His ideas primarily stem from a series of architectural practices he conducted in the 1950s after World War II. During post-war reconstruction, the conflict between modern functionalist architecture and traditional historical contexts further shaped his ideas Eventually, he proposed the important concept of "operative history" and emphasized architecture's core guidance in design, laying the foundation for Italian morphological studies. His ideas were further refined by his assistant, Gianfranco Caniggia.

Michael Robert Günter Conzen is considered a pioneer in British typomorphological studies, heavily influenced by German human geography. In his works and practices, he introduced a series of important methodologies, including the use of urban morphology as a basis for regional division in morphological regions. His ideas were later inherited and

developed by the Urban Morphology Research Group (UMRG) at the University of Birmingham.

Contemporary developments in typomorphological studies demonstrate a trend of integration and refinement. Classical typomorphological methods continue to be improved and developed through integration with other disciplines. However, for urban designers, the specialized nature of typomorphological methods requires consideration of their geographic and social contexts, and the practical application of typomorphological studies in China remains somewhat limited.

1.4.3.Domestic Typomorphology Research

In domestic research, foreign scholars have used Conzen's regional morphology concept. Jeremy Whitehand and Kai Gu's article "Extending the compass of plan analysis: a Chinese exploration"[1] attempted Conzen's analysis in the traditional ancient city of Pingyao in China. They inferred the composition and stages of Pingyao's city layout and obtained the historical geographical structure of urban planning. The successful application of this method in an environment quite different from the previously mainly European and American experiments demonstrated confidence in its global applicability and its significant implications for urban planning and management.

Chinese scholars are also actively applying Conzen's theory to Chinese sites and connecting it with architectural heritage preservation. For instance, Yao Sheng's "The Dilemma and Resolution of Conzen's Theory Application in China"[1] objectively analyzed the objective conditions for conducting analyses in Chinese sites and pointed out the research challenges. He also attempted a morphological study of Guangzhou Liwan District's historical neighborhood using the traditional Conzen's analytical approach, resulting in the division of urban landscape units. This not only dissected the urban morphological structure of the case area but, most importantly, provided the foundation for historical neighborhood preservation planning.

Furthermore, Chinese scholars pay attention to the development of Conzen's theory and propose some quantitative methods to address its deficiencies. For example, Tian Yinsheng's article "Exploration of Quantitative Analysis Methods in Conzen's Urban Morphology - A

Case Study of Traditional Blocks in Guangzhou"[1] proposed quantitative analysis measures for the three elements underlying the morphological regions: plan types, building types, and land use. The article mainly employed spatial syntax for the plan unit, and compared and analyzed the choice and calculation of configurational values. Finally, the K-means clustering method was combined with GIS technology for integration and visualization.

Regarding the process-type method, relevant research in China is relatively lacking, with existing literature introducing Muratori's personal ideas and theories, without exploring the practical applications of the process-type method in sites. Examples include Jiang Zhengliang's "The Pioneer of the Italian School of Urban Morphology: Muratori,"[8] Qi Wenju's "From Housing Types to Urban Morphology: Reading Caniggia's Typomorphological Thought,"[8] and Zhu Peiyi's "Operable History - Reading the Thought of Italian Muratori School of Typomorphology and Preliminary Exploration of Design Practice Based on Urban Morphological Analysis."[9].Regarding the summative literature of typomorphology, Chen Fei's article "A New Research Framework: The Application of Urban Typomorphology in China,"[10] published in 2008, explored the research methods of Western typomorphology and proposed a research framework specifically tailored to Chinese cities.

By comparing the current research status at home and abroad, it can be seen that there is a relatively unbalanced phenomenon in China's urban morphology research. While Conzen's theory has been explored in greater depth, Muratori's theory is mainly introduced at a superficial level, lacking practical applications. Both domestic and foreign scholars have noticed a strong connection between these two theories. Some foreign scholars have used multiple research methods to compare and analyze a single research object, but domestic scholars are still relatively lacking in research on the integration of these two analytical approaches.

1.4.4.Practice of Typomorphology.

As a method of urban analysis, Typomorphology has been applied in various practical contexts. Muratori utilized his research on historical maps of Venice in a city design competition held in the San Giuliano area of northeastern Venice.Muratori's proposal drew inspiration from three historical stages of Venice's urban development, resulting in three

distinct proposals. Eventually, Muratori won the competition with one of his proposals[3].

Following Muratori's research,Caniggia further developed and refined his Typomorphology analysis method through practical applications. He participated in the urban renewal competition for the Campo di Marte district on the island of Giudecca in Venice, as well as the Costa degli Ometti residential area project in Genoa. In the Genoa residential area project, Caniggia validated a method that closely links design interventions with the built environment and historical housing types[11].

Kropf's research also contributed to the fusion of Typomorphology studies. In his involvement in the land use planning in Mennecy, a small town in the southern suburbs of Paris, Kropf began with urban morphology research and completed morphological zoning on the site plan. He then formulated planning control guidelines for different areas and buildings. Although this plan has not been executed to date, it demonstrates the potential application of comprehensive Typomorphology research in urban planning, especially in preservation planning[12].

In the preservation planning of many famous historic cities in Italy, the typomorphology analysis method plays a crucial role. Between 1962 and 1965, historian and urban planner Leonardo Benevolo conducted a typological study of Bologna's architectural heritage, forming the basis for a preservation plan created by Pier Luigi Cevellati[1] . Cevellati statistically analyzed the typical public and residential buildings from the 17th century onwards, and then integrated new functional modules into the traditional fabric to fill the gaps in the city's traditional tissue effectively.

In the 1990 Palermo urban preservation plan, Cevellati continued to apply his architectural heritage preservation concept. His typological map became part of the new general plan for Palermo. This map not only depicted various building types but also included intervention patterns for each type, providing principles for restoration or reuse[1]. Due to the continuous application of Typomorphology in the preservation planning of historic cities in Italy, the application of Typomorphology in architectural heritage preservation has become well-established. For example, the 2009 preservation plan for the historic district of Rome included a comprehensive and detailed set of preservation rules for different historical periods and specific building types in the city.

1.5.Contents and Methods of the Research

1.5.1.Contents of the Research

(1) Summarize the theoretical background and main working framework of typomorphology, conduct an in-depth analysis of the fundamental ideas, important concepts, and primary analytical methods involved in typomorphology. Explore the application background of typomorphology methods and analyze their potential application in China.

(2) Analyze the application cases of typomorphology analysis methods, understand the specific operational procedures of these methods, and construct application frameworks for generating concrete outcomes.

(3) Conduct research and survey on the historically significant arcade buildings with distinctive characteristics in Guangzhou, and investigate the historical systems related to arcade buildings. Summarize the development patterns of arcade architecture and the arcade regulation.

(4) Adapt the application framework to the current situation in China, and finally, perform a typomorphological analysis of arcade buildings within the area of the Long Bund, providing suggestions for morphology control.

1.5.2.Methods of the Research

(1) Typomorphological Analysis Method: This thesis adopts the European typomorphological approach, utilizing the typomorphological analysis framework to deeply analyze the building morphology on the studied site from different types and periods, taking an urban perspective. The aim is to understand the underlying reasons for the morphological changes and to summarize the morphological Characteristics and developmental patterns of the buildings.

(2) Comparative Inductive Research Method: This thesis analyzes the theories of different schools of typomorphology and summarizes important concepts therein. By combining various practical applications of typomorphology theories from different countries with the actual site, a theoretical and practical framework is constructed through comparative

research.

(3) Literature Research Method: This thesis gathers a significant amount of urban regulations and image data from different historical periods, providing multiple historical foundations for the analysis and research object.

(4) Field Survey and Mapping Method: The author conducted on-site investigations to conduct building surveys of the existing 55 arcade buildings on the site. building drawings were created, and the research data was summarized.

1.6.Framework of the Research

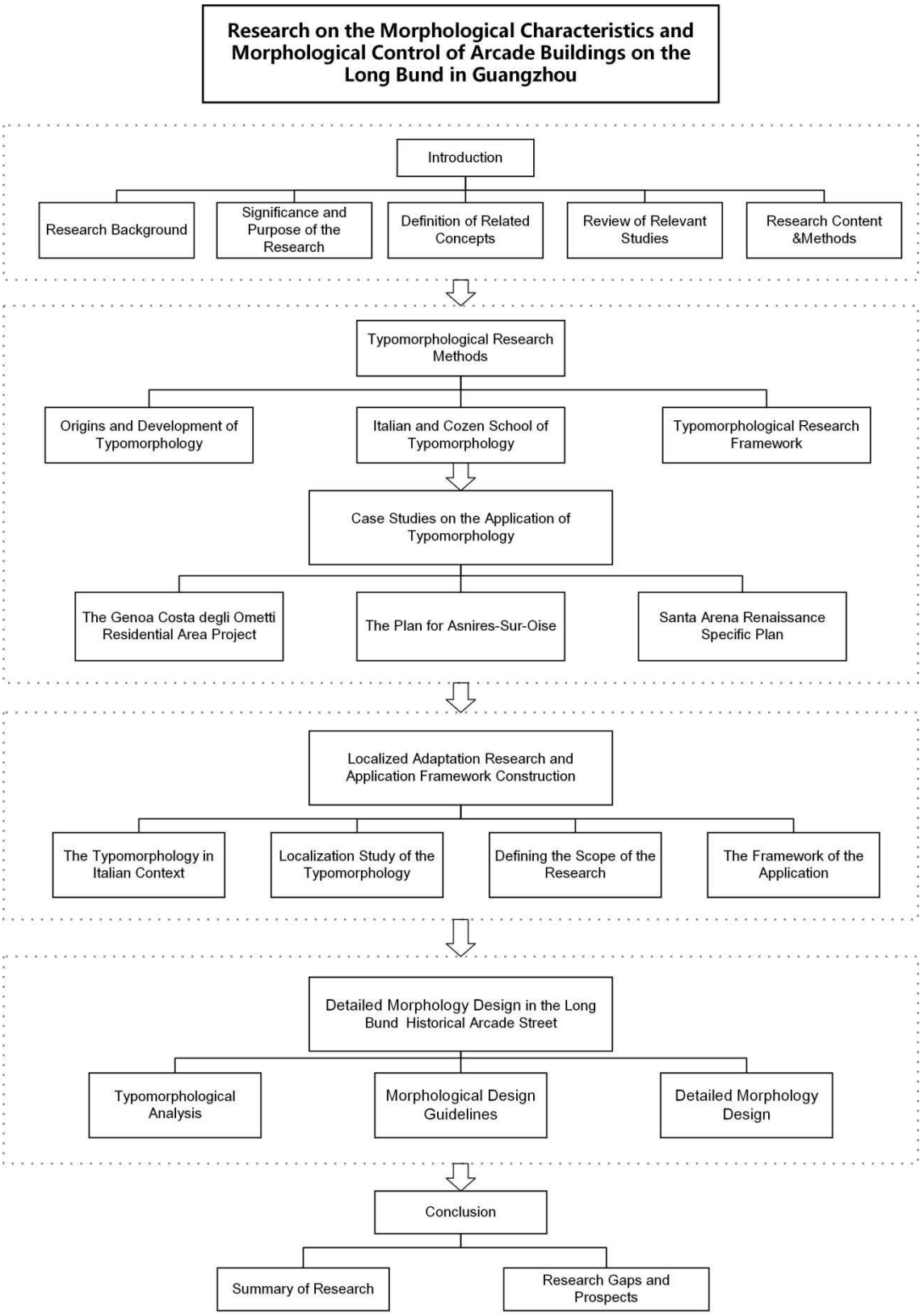

Figure 1-1 Framework of the Research

（Source：Illustrated by the author）

1.7.Summary of This Chapter

This chapter serves as the introduction section. Firstly, in the theoretical background, it discusses the problems faced in contemporary Chinese urban development and highlights the issue of architectural character loss in urban redevelopment. To address this, European typomorphology research is introduced, and the research objectives of typomorphology are briefly outlined.

By connecting the research background and theoretical introduction, this chapter summarizes the theoretical and practical significance of applying typomorphology in Chinese urban redevelopment. The theoretical significance lies in enhancing the methods of typomorphology and providing new perspectives for the theory of historic urban district preservation in China. In practical terms, it offers a set of guiding principles for applied sites.

For the convenience of future research, relevant conceptual definitions are provided,as well as the objects of study. A brief overview of typomorphology's theoretical schools, domestic and international research status, and its practical applications is also given, followed by a conclusion.

In the latter part of this chapter, the research content and methods used in this thesis are introduced. The research content includes both theoretical and on-site studies. The theoretical aspect covers the origins of typomorphology and case studies, while the practical aspect involves on-site surveys and analysis of arcade buildings. The research methods employed for the purposes of this study are also specified.

Lastly, this chapter visually presents the structure of this thesis through illustrations. The logical structure of this thesis involves constructing a localized working framework to guide practical design based on theoretical foundations. It is divided into sections for foreign theoretical research, localization of the working framework, and design practice.

Chapter 2 Typomorphological Research Method

The research of typomorphology can be divided into two schools, namely the Italian school and the British school. Due to their different social environments and theoretical backgrounds, these two schools have some differences in the scope of their research objects and research methods. The Italian school, with its rich urban history, has always focused on how to establish connections between modern architecture and the past. On the other hand, the British school pays more attention to classifying various urban forms to understand the development process of towns and the driving factors behind it, thereby gaining a deeper understanding of the process of urbanization.

By understanding the respective applicability of these two theories, it is possible to effectively integrate their research methods, complementing each other's theoretical shortcomings, and forming a comprehensive working framework to cope with the increasingly complex urban environments of today.

2.1.The Italian Typomorphology School

2.1.1.Muratori's Typology Theory

Muratori, a prominent figure in the field of urban planning and architecture, was born in Modena, Italy, in 1910. His early education laid the foundation for his future contributions to the study of urban morphology and typology. Between 1928 and 1933, Muratori pursued architecture studies in Rome, where he was exposed to the teachings of Gustavo Giovannoni, a leading urban planner and the recognized founder of the Italian urban planning discipline. Under Giovannoni's mentorship, Muratori developed a keen interest in studying historical contexts and the relationship between tradition and modernity in urban design.

Giovannoni's perspective on urban design emphasized the importance of understanding a city's historical development and using it as a basis for formulating new theories and methods. He proposed that the physical form of a city is an expression of an ongoing development process and should be viewed in an "organic concept," where historical and contemporary elements coexist and interact. Giovannoni's ideas resonated with Muratori and profoundly

influenced his later theoretical work[15].

In 1952, Muratori was invited to teach in Venice, a city renowned for its historical richness and distinctive urban form. This opportunity marked a significant turning point in his career and provided the setting for the development of his pioneering work on the Italian process typology method. In his typological research, Muratori introduced the concept of "operational history," which highlighted the significance of considering time in the analysis of cities. He recognized that urban organisms are in a constant state of evolution, shaped by historical layers that continue to influence contemporary urban landscapes. To create new and meaningful designs, Muratori believed that a comprehensive understanding of a city's historical context was essential, and this informed his approach to typology research.

Muratori's typology research involved dividing the historical development of a city into distinct periods, each characterized by specific urban forms and building types. These historical periods served as reference materials to guide the creation of contemporary urban designs that respected the city's evolution over time. His "operational" method of historical research sought to establish connections between the past and the present, enriching the understanding of urban morphology.

An exemplary project that showcases Muratori's typological ideas is the San Giuliano Shoals competition in Venice. In this competition, Muratori submitted three proposals, each corresponding to a key historical period in Venice's development. Estuaries I represented a modern interpretation of the medieval urban fabric, with islands composed of self-sufficient parish towns featuring prominent water routes. Estuaries II depicted a contemporary version of the Gothic urban fabric, with peninsulas forming independent town units and a harmonious interplay between water and land routes. Estuaries III paid homage to the Renaissance and pre-modern urban planning concepts, presenting a morphological framework that integrated water and land routes into a cohesive and significant road network（Figure 2-1 I）

Throughout his career, Muratori's contributions to the field of urban morphology and typology extended beyond Venice. His ideas and methodologies found resonance in various parts of the world and significantly impacted urban planning and design practices. By emphasizing the importance of historical context and the continuous evolution of cities, Muratori's typology research provided valuable insights for creating sustainable and

contextually sensitive urban environments[1].

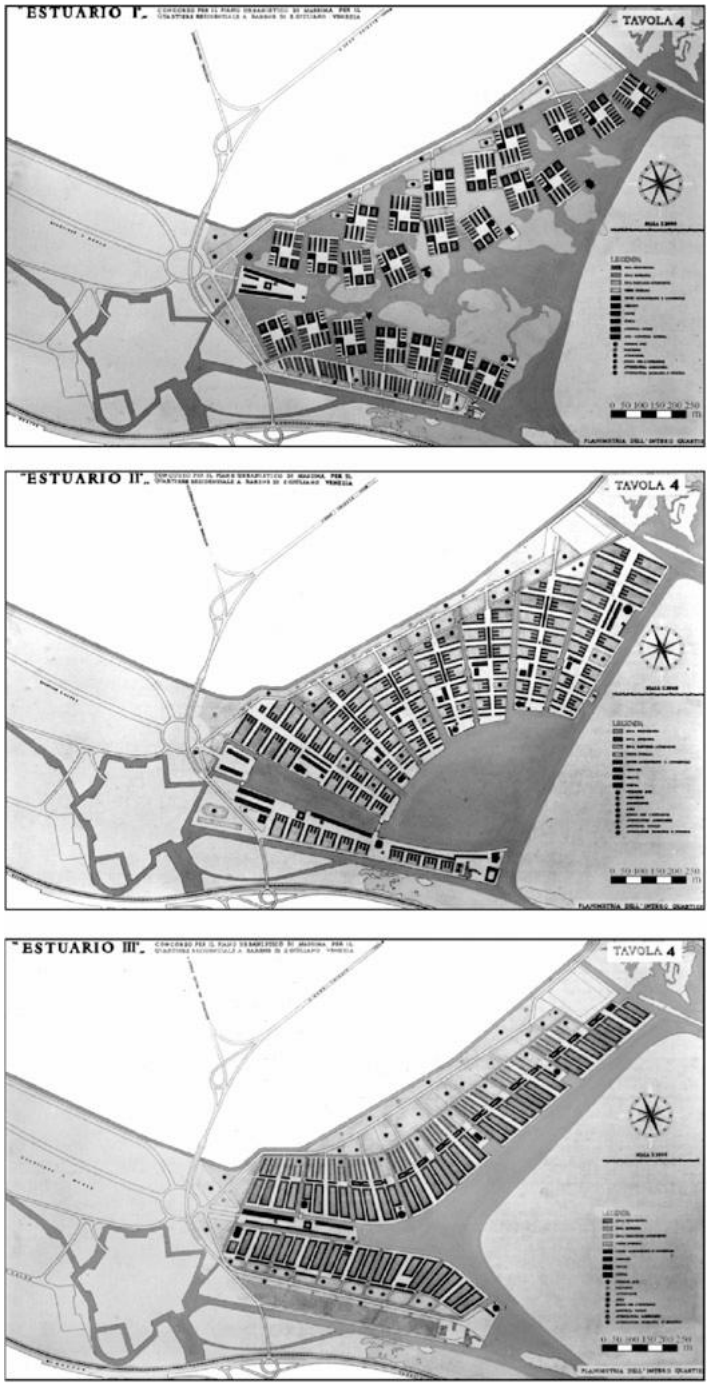

Figure 2-1 The Barene di San Giuliano in Venice: Estuaries l, II and III

（Source：Compiled by the author based on de Oliveira “*Urban morphology*”）

As Muratori's career progressed, he gradually shifted his research focus to philosophical theories while entrusting his typology research to dedicated assistants. Nevertheless, his legacy in the field of urban morphology and typology remains enduring, inspiring future

generations of urban planners and architects to embrace the dynamic and multidimensional nature of urban form. Muratori's emphasis on understanding the historical layers of cities and incorporating this knowledge into contemporary urban designs continues to shape urban planning practices and foster an appreciation for the rich historical and cultural identities of cities worldwide. His pioneering work continues to be celebrated as a bridge between the past and the present, guiding the design of cities that honor their heritage while envisioning a vibrant and sustainable future.

2.1.2.Caniggia's Process Typology Theory

In the early 1960s, Muratori's research team began to take shape, and Gianfranco Caniggia was one of the assistants. Caniggia's research focus was to further refine Muratori's ideas from an architectural perspective. He tended to simplify Muratori's theoretical system and emphasized the practicality of Muratori's typology method. Caniggia defined a series of concepts in Muratori's ideas and established the process typology method[16].

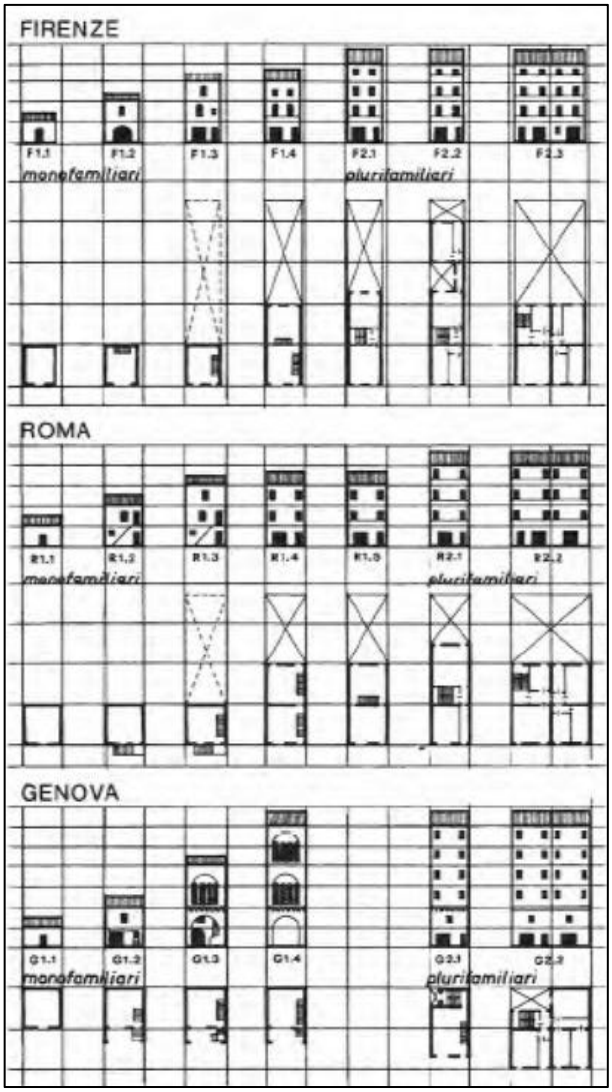

Figure 2-2 Caniggia's Analysis of Typological Evolution in Various Italian Cities' architecture.

（Source：Compiled by the author based on Gianfranco C, Luigi M G. “Interpreting basic buildings”）

The so-called process typology method was elaborated in his work "Interpreting Basic Buildings." Caniggia believed that the development of typologies had a certain origin, namely the so-called leading type. The leading type gave rise to synchronic variations (variations in different regions during the same period) and diachronic variations (variations in the same region over time). The former refers to the evolution of the same type in different regions during the same period, while the latter refers to the evolution of the same type in the same region over different historical periods. In other words, the same leading type would give rise to different subtypes in different regions and historical periods[17]. Parcels and buildings of the same type were combined according to certain rules to form urban tissue, and different urban tissues were assembled together to form urban forms. Caniggia believed that by maintaining a

certain continuity with the "leading type" in new designs, a certain legacy relationship could be established between new and old cities, as well as between new and old buildings.

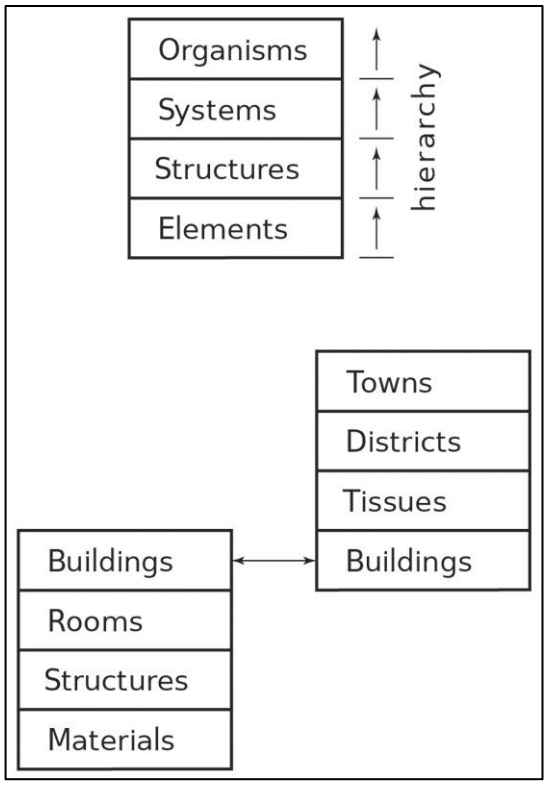

Figure 2-3 Caniggia's Morphological Subdivision System

（Source：Compiled by the author based on Kropf K“ Ambiguity in the definition of built form”）

Caniggia also developed Muratori's concept of scale into a morphological subdivision system. He established a hierarchical sequence comprising four levels: element, element structure, systems of structures, and organism of systems, with increasing complexity. He applied this subdivision system to both architecture and urban planning. The urban fabric was subdivided into four levels: houses, tissue, blocks, and towns. He created an analytical framework from architecture to urban planning.

2.1.3. Analysis of Research Tools and Methods

The Italian school with architectural background tends to create "Typological Maps" that represent different historical periods. These maps depict the ground floor plans of all buildings within a city or region. Similar to archaeological site maps, Typological Maps not only convey the urban morphological structure but also allow for the study of specific building types through analogy. By presenting the overall urban form and architectural layout

on the same drawing, these maps provide a comprehensive understanding of the city's development.

The creation of Typological Maps can be traced back to over two hundred years ago in Italy. In 1748, Giovanni Battista Nolli, at the request of Pope Benedict XIV, produced the "New Map of Rome" (La Nuova Pianta di Roma). This set of 12 maps intricately documented the construction status of both the city and suburbs of Rome. The Nolli Map uniquely presented the morphology of the entire city's public spaces, including streets, squares, public buildings, and the entrances and courtyards of residential buildings. However, private areas were completely blacked out . The accuracy and comprehensiveness of this map have made it a fundamental reference for later generations to understand the historical city center of Rome and served as the original prototype for the use of Typological Maps in the Italian school.

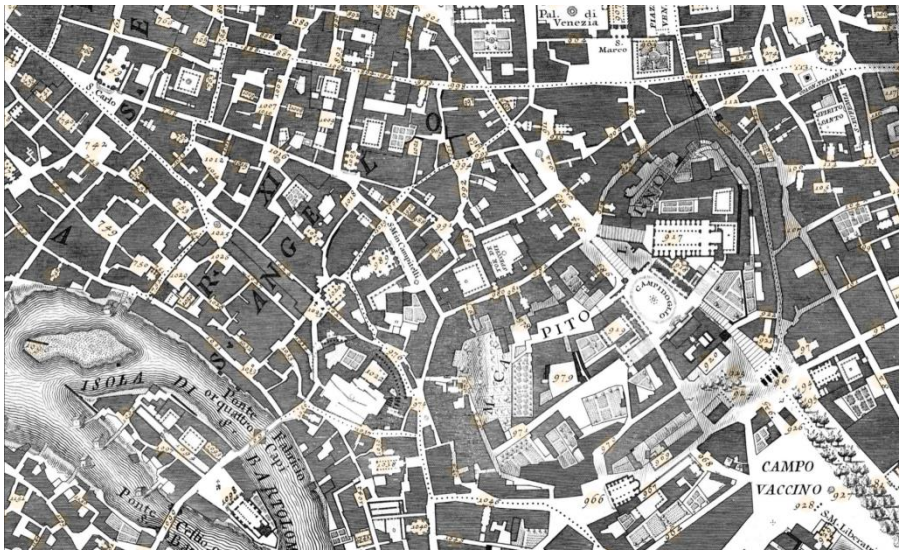

Figure 2-4 The Part of the Nolli Map

（Source：Compiled by the author based on https://web.stanford.edu/group/spatialhistory/nolli/）

In 1958, Muratori, while teaching the "Architectural Space Typology" course at the University of Venice's School of Architecture, selected specific areas in the city. Together with his students, he meticulously measured all the buildings in those areas and created Typological Maps of the entire region. Subsequently, they developed "Conjectural Typology Maps" for the same region based on historical records and archaeological maps. According to Muratori, these two maps vividly showcased the urban morphology and architectural types from different historical periods, allowing for further research on their development and

evolution through comparisons[18].

As Muratori's assistant, Caniggia transformed his theories and experiments into a systematic methodology, aiming to create a scientific system capable of interpreting any urban settlement. This endeavor was first demonstrated in his study of the city of Como, where he produced a large and detailed ground floor plan (scale 1:200) of the central urban area from the 19th century. By superimposing this plan with archaeological maps from the Roman period, Caniggia indicated a certain relationship between the new urban development and the ancient imprints that once existed.

Subsequently, he furthered his efforts by creating typological maps and "speculative typological maps" for various Italian cities such as Rome, Como, Genoa, and Florence, depicting different historical periods（Figure 2-5 ）. Through these maps, he conducted a synchronic and diachronic comparison of fundamental building types. These cartographic records are documented in two works: "Lettura di una citta: Como"[18] and "Architectural Composition and Building Typology[16]".

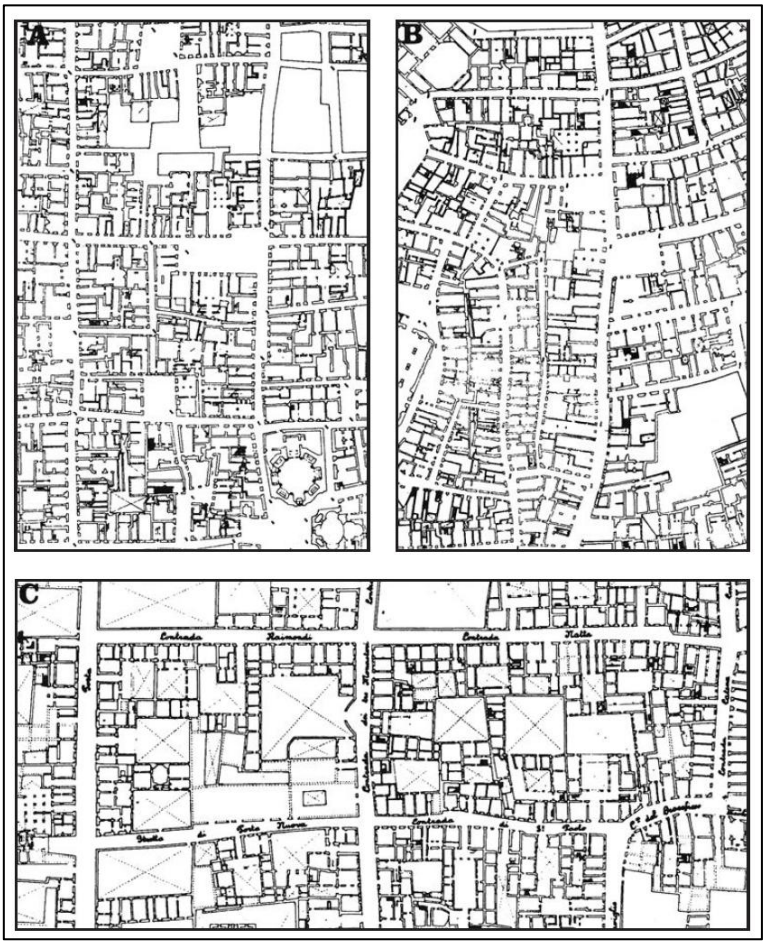

Figure 2-5 Building Surveys of Genoa and Como By Caniggia

（Source：Compiled by the author based on Caniggia“Interpreting basic buildings”）

The Italian school emphasizes a hierarchical research approach and the transition from research to design. Similarly, the foundation of their research relies on archaeological maps, historical maps, literature, and field surveys, but the creation of typological maps is more precise and visually reflects the relationship between individual buildings and the urban environment. Muratori and Caniggia constructed a methodological system that utilizes typological maps as a fundamental tool to interpret the "urban organism" from various levels, ranging from the city to materials. Importantly, they aimed to initiate new designs through their understanding of the city. The specific research process includes the following steps:

First, conducting on-site surveys and compiling typological maps and inferred typological maps based on historical information.

Next, analyzing and summarizing cadastral information and the evolution of building types according to the drawings.

The third step involves redefining the parcels based on the new urban context and functional requirements, and designing the transformation of building types; finally, integrating the new building types into the redefined parcels and inheriting and transforming traditional architectural features at the component and material levels.

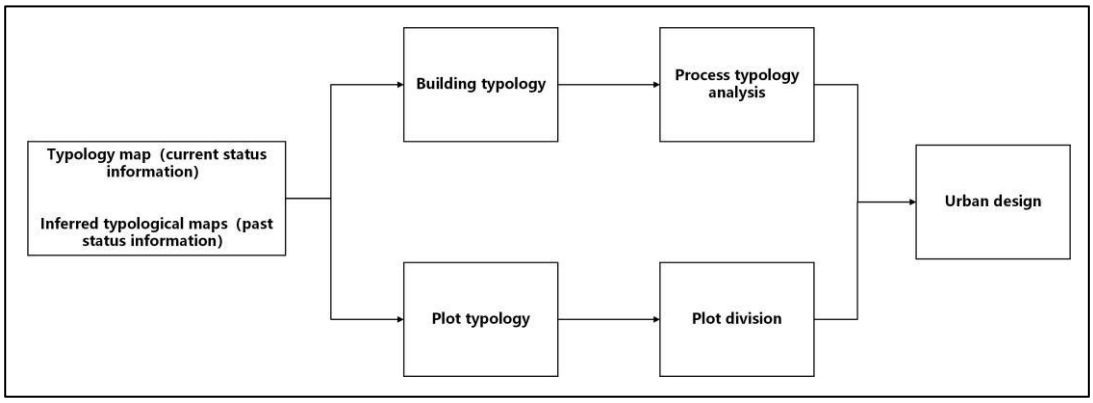

Figure 2-6 The Italy Typomorphology Research Method

（Source：Compiled by the author based on Dong Yinan“The Typo-morphology Approach to the Conservation and Regeneration of the Xiaoxihu Historical Area,Nanjing”）

2.2.The British Typomorphology School

2.2.1.Conzen's Morphology Theory

Conzen, born in Berlin in 1907, received his geographical training at the University of Berlin's Department of Geography from 1926 to 1932. During this time, he developed an interest in the ideas of geographers such as Otto Schlüter and Walter Geisler, which laid the foundation for his morphological research ideas. In 1933, Conzen moved to England, where his ideas further developed and matured[20].

He established and developed the British morphology method, with one of his most important works being "Alnwick, Northumberland: a research in town-plan analysis," which laid the basic theoretical framework and terminology for urban morphology research. He believed that from a morphological perspective, the geographical features of a town can be reflected in its townscape, which is a comprehensive reflection of town plan, pattern of building morphology, and pattern of urban land use. The town plan includes all the geographical features elements that can be seen on the Ordnance Survey's 1:2500 maps of

built-up areas in the UK, consisting of three basic elements: streets and their layout in the street system, plots and their aggregation in street-blocks, and buildings, or more precisely, the block-plan of buildings[3].

Conzen proposed an evolutionary research viewpoint, suggesting that cities leave behind their unique material remains during different periods of development. Through historical research and field investigations, one can discern different morphological periods in a city's development. By interpreting the organization and historical evolution process of the three elements mentioned above, different plan types can be identified, forming the basis for town morphological regions. This division of morphological regions is not a simple superposition of the three elements but a comprehensive reflection of urban historical information, spatial characteristics, and usage patterns. It is also an essential basis for classifying and controlling the townscape.

Conzen's method is more focused on the analysis and interpretation of the historical evolution of cities. He believes that cities undergo continuous development and changes over time, and each period of development leaves behind unique material remains that reflect the characteristics of that time. To understand the morphological development of a city, one must analyze and interpret these material remains and their historical context.

In his research work, Conzen proposed the concept of morphological regions, which are spatial units characterized by a unique combination of the three basic elements of town plan, building morphology, and urban land use. These morphological regions are not static, but they evolve over time as cities develop and grow. He also emphasized the importance of understanding the historical context of cities and how they have evolved over time, as this provides essential insights into the formation and development of urban morphology.

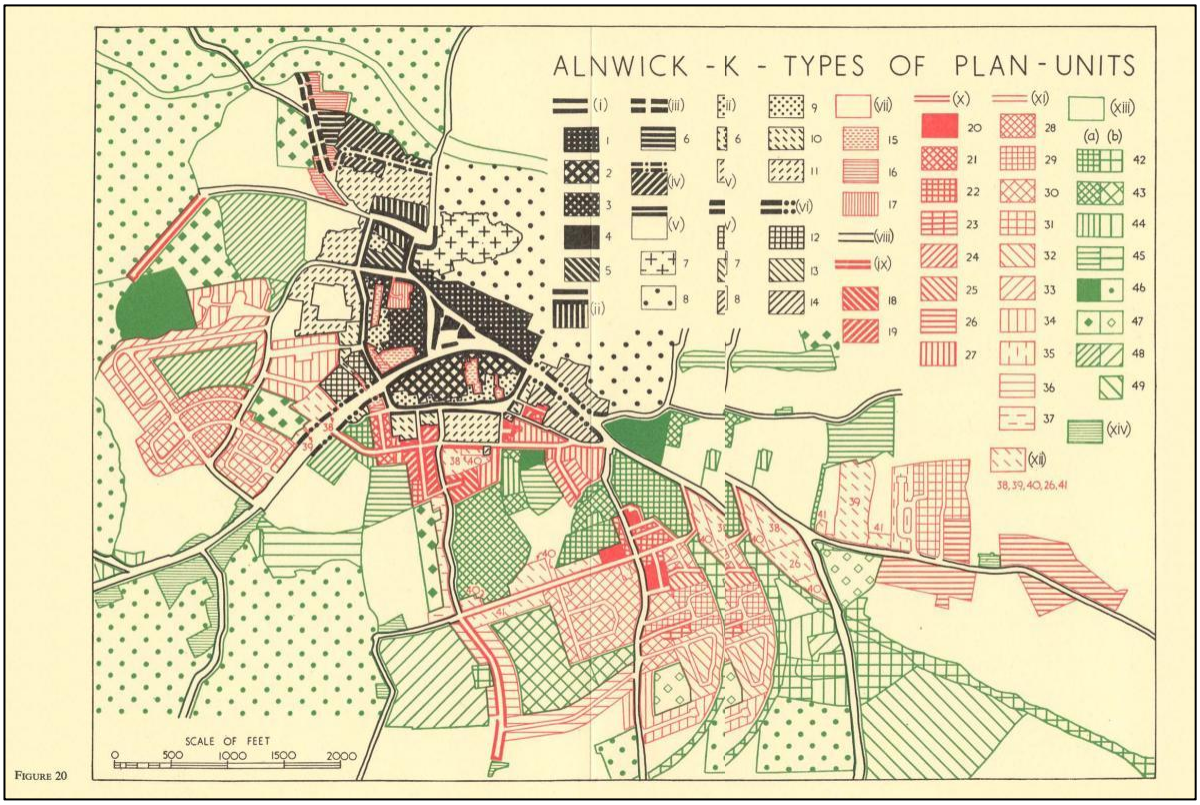

Figure 2-7 Conzen's Town-plan Analysis of Alnwick.

（Source：Compiled by the author based on Conzen M R G. "Alnwick, Northumberland: a research in town-plan analysis"）

Through the plan analysis of the historic cultural town of Alnwick in England, Conzen showcased his morphological research method. In the book, he divided Alnwick's historical process into five morphological periods and emphasized how each period left its features in the townscape. Based on these features, he classified Alnwick's existing townscape into fourteen main plan unit types[21].

Conzen's morphological research ideas have had a significant impact on the field of urban morphology. His method has been widely adopted and applied in urban planning and design. By understanding the historical evolution of cities and their unique morphological characteristics, urban planners and designers can create more sustainable and contextually appropriate urban environments. His research has also provided valuable insights into the cultural and historical significance of urban morphology, helping to preserve and protect historical urban areas.

Conzen's morphological method is currently continued and developed by the URMG

(Urban Morphology Research Group) at the University of Birmingham. In the later stages of its development, it has been integrated with other urban morphology studies, further expanding the application scope and research methods of Conzen's morphological method.

Overall, Conzen's morphological research ideas have contributed to a deeper understanding of the complexity and richness of urban forms and the importance of historical context in urban development. His approach emphasizes the dynamic nature of cities and the need to consider the historical layers and material remains that have shaped urban morphology over time.

2.2.2.Analysis of Research Tools and Methods

Planar typological units and morphological regions are the primary interpretative tools used by Conzen in his urban plan analysis. In the case study of Anagni, he identified planar typological units from different historical periods in the city and distinguished them on the map using various colors and patterns, reflecting the morphological characteristics and historical evolution of urban blocks formed during different periods. Subsequently, in the study of Ludlow, a small town on the Anglo-Welsh border, Conzen demonstrated the method of dividing morphological regions in detail: first, he created three maps based on historical maps and on-site surveys, representing the distribution of planar typological units, building forms, and land use. Each map contained five levels, differentiated by different line types. Then, he integrated and superimposed the information from the three maps to obtain a morphological region division map, also consisting of five levels . The city was dissected into various-sized units that were assembled together, with each unit containing roads, plots, and buildings, and the boundaries between different units could be either plot lines or road centerlines（Figure 2-8）. This map of urban morphological regions provided a foundational framework for understanding the evolution of Ludlow's urban form and determining areas for preservation[22].

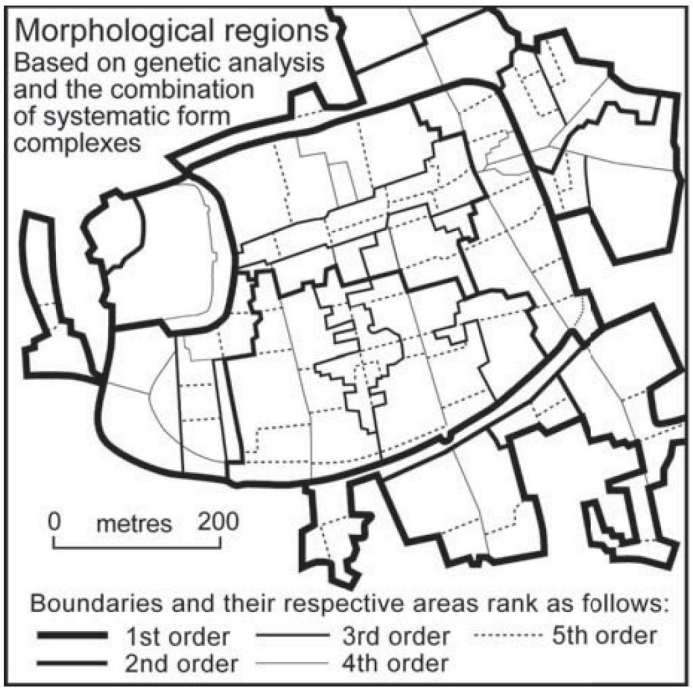

Figure 2-8 Urban Landscape Units in the Old Town of Ludlow

（Source：Compiled by the author based on "*Urban morphology and historic urban landscapes*"）

In summary, one of the main research methods of the Conzen school is to interpret the complex and diverse urban landscapes through the collage of different morphological regions. This method relies on a comprehensive analysis of the evolution of urban form, architectural layout, and land use, which requires detailed historical maps, literature, and on-site surveys as the foundation. The specific research process includes the following steps:

First, conducting historical research on the study area, especially collecting and comparing historical urban maps.

Second, focusing on site surveys that emphasize streets, parcel layouts, building types and functions, and land use conditions.

Third, based on the results of historical research and on-site surveys, creating distribution maps of planar typological units, architectural forms, and land use patterns in the study area.

Finally, overlaying the above three maps to form a comprehensive urban morphological region distribution map . The goal of this research is to understand the traces of different construction periods and urban development processes in the city through the division of morphological regions. Then, based on the historical evolution and current characteristics of different morphological regions, to establish control and guidance measures for future

construction and transformation, becoming the spatial classification basis for urban morphological management.

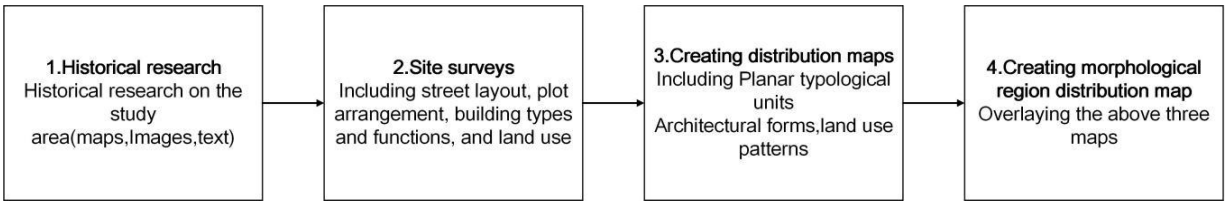

Figure 2-9 The Britain Typomorphology Research Method

（Source：Compiled by the author based on Dong Yinan“The Typo-morphology Approach to the Conservation and Regeneration of the Xiaoxihu Historical Area,Nanjing”）

2.3.Towards a Convergent Typomorphological Research

2.3.1.Comparison of the Two Schools' Research Methods

From the analysis of the two distinct typomorphological theories mentioned above, it becomes evident that these two schools originated from the fields of historical geography and architecture, leading to differing perspectives in their study of cities. The British school places greater emphasis on the macro-level townscape, with research outcomes centered on the analysis of urban morphological evolution and the division of morphological regions. On the other hand, the Italian school takes a more granular approach, starting from individual buildings and establishing a typological system that encompasses buildings and extends to cities through the creation of typological maps, which provide valuable guidance for building conservation and new design initiatives.

The British school's approach to studying cities is deeply rooted in the principles of historical geography. Scholars like Conzen played pivotal roles in shaping this school of thought. Their focus was on understanding the evolution of urban form and the underlying processes that led to the emergence of different morphological regions within cities. Conzen, in particular, made significant contributions to the study of urban morphology with his concept of "morphological cycles." He believed that cities undergo cyclical patterns of development, and understanding these cycles is crucial for comprehending the spatial structure and growth of cities over time.

Conzen's methodological approach involved analyzing historical maps and documents to

discern patterns of urban development and the transformation of urban fabric. His research delved into the relationships between streets, plots, and buildings, recognizing the importance of these elements in shaping the overall morphology of cities. Through his meticulous analysis, Conzen was able to identify distinct morphological regions within cities, each representing a different historical period and reflecting the socio-economic conditions and cultural influences of its time.

In contrast, the Italian school, influenced by architectural theories, approached the study of cities through the lens of individual buildings. Key figures like Gianfranco Caniggia.

Caniggia's typomorphological approach involved creating typological maps that showcased the distribution and arrangement of different building types within cities. These maps provided a visual representation of the urban fabric, highlighting the spatial organization of buildings and their relationships with one another. By studying the evolution of building types over time, Caniggia sought to understand the historical development of cities and the factors that influenced their architectural character.

Both the British and Italian schools share similarities in their research objects, methods, and tools, despite their differing perspectives. Firstly, both schools adopt a hierarchical classification of the physical morphology of cities. They recognize that cities are complex systems with multiple layers of spatial organization, ranging from the macro-level townscape to the micro-level building forms. Buildings are seen as critical elements within this hierarchy, influencing the overall character and identity of cities.

Moreover, both schools acknowledge the significance of historical maps as essential tools for understanding the evolution of cities. Historical maps provide valuable insights into the past urban form, showing how cities have grown and transformed over time. By analyzing these maps, researchers can identify patterns of development, trace the changes in building types and layouts, and gain a deeper understanding of the historical context that shaped cities.

2.3.2.Convergence of Two Schools

In 1987, American scholar Moudon introduced the term "typomorphology," coined by Italian architect Carlo Aymonino, to define the new research framework formed by the integration of the two schools. She believed that typomorphology research reveals the

material and spatial structures of cities, encompassing both typological and morphological aspects[18]. After 1990, British scholar Kropf compared and integrated core concepts and terms from Conzen and Caniggia's theories, proposing a comprehensive typomorphology research framework. With the establishment of the International Seminar of Urban Form (ISUF), communication between the two schools became closer. Morphology and typology interpret and understand cities, neighborhoods, and buildings from different perspectives, significantly influencing and guiding design and practical work[24].

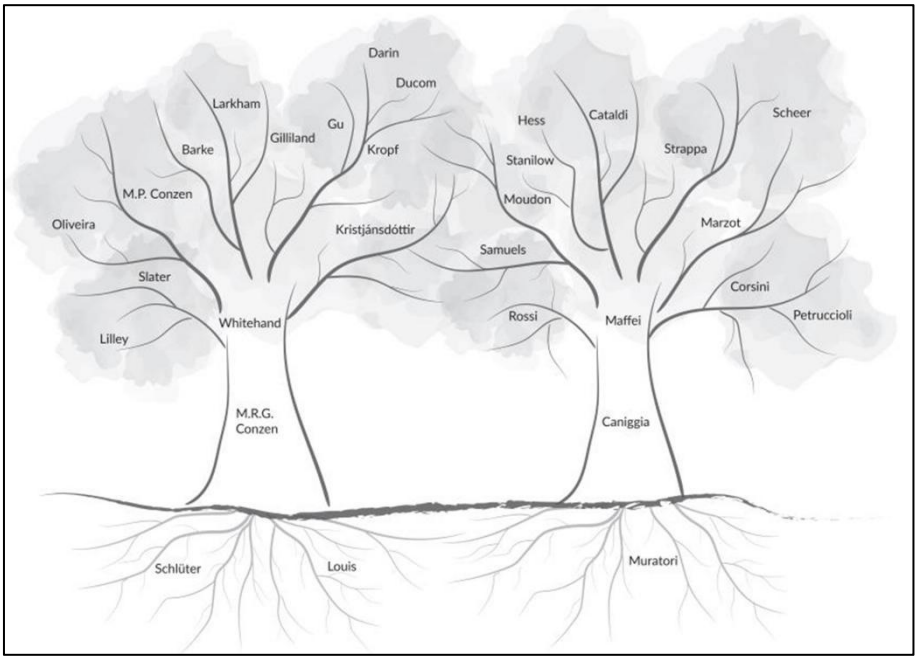

Figure 2-10 The Origin and Convergence Trend of Two Schools

（Source：Compiled by the author based on Kristjánsdóttir S. “Roots of urban morphology”）

Kropf's research is also reflected in the exploration of the application of typomorphology. He proposed the strategy of "form-based zoning," which is an alternative to traditional function-based zoning[25]. Based on a framework of nine generic types, Kropf analyzes the morphology at various levels and derives corresponding characteristics, resulting in specific form regions. Elements under study can then be designed and intervened through guidelines. For example, guidelines can impose restrictions on the materials, structures, and corresponding spaces in a specific area. The guidelines can also include intervention requirements of different levels, offering flexible control and adjustments to the elements.

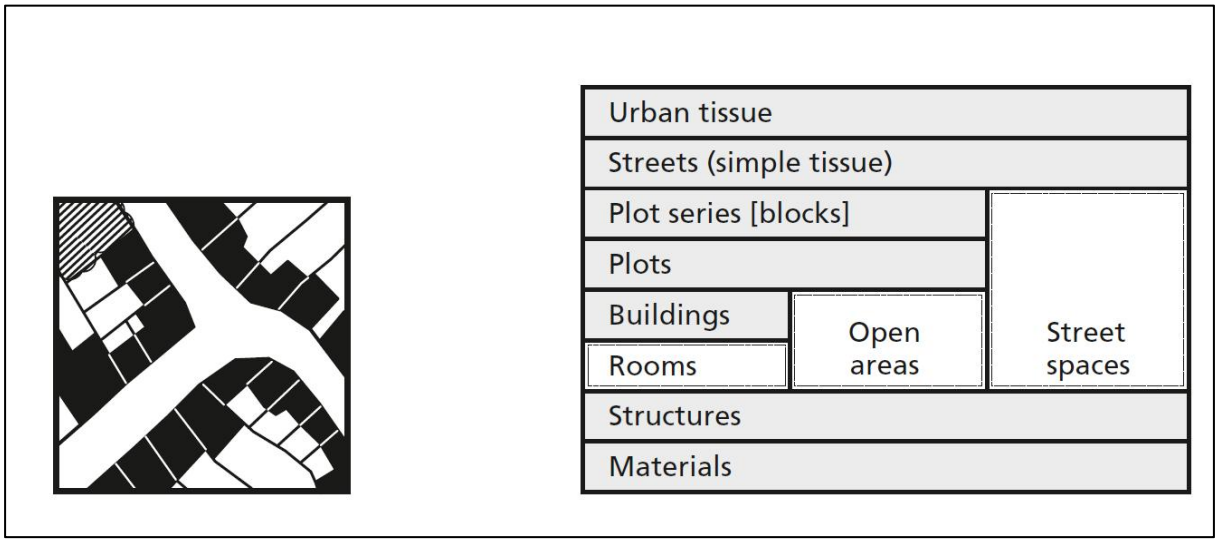

Figure 2-11 The New Hierarchical Sequence Proposed by Kropf.

（Source：Compiled by the author based on Kropf K. “Ambiguity in the definition of built form”）

Kropf integrates Conzen and Caniggia's hierarchical sequences and introduces three types of void spaces – room, courtyard, and street spaces – to form a more comprehensive hierarchical system with elements at various levels mutually encompassing one another. These three void spaces are distinguished by tangible or intangible boundaries. Rooms are indoor and private spaces, courtyards are outdoor spaces that are either private or semi-private, and street spaces are entirely public outdoor spaces[26]. This illustration not only improves the hierarchical relationship from urban tissue to building materials, where upper-level elements are composed of lower-level elements and void spaces, but also reflects human movement patterns and pathways through the introduction of the void space system.

The fusion of morphology and typology in the typomorphological research framework opens up new possibilities for interpreting and understanding cities, neighborhoods, and buildings. It allows researchers and practitioners to explore urban form and structure from multiple perspectives.

2.4.Typomorphological Research Framework

2.4.1.Kropf’s Typomorphological Research Framework

Kropf's book "*The Handbook of Urban Morphology*" provides a detailed introduction to his typomorphology framework[27]. Firstly, he divides the process of typomorphology analysis

into five major steps: initial preparation, information collection, desk analysis, field investigation, interpretation, and communication. The first step involves determining the research object, which can encompass various aspects of urban morphology. The scope of the study can vary from a minimum level, involving only building morphology and general usage indications, to a larger study encompassing various building types and their generated urban organizational features within a specific area. Once the research object is determined, the scope of the study needs to be defined, considering the level of detail, ranging from large-scale urban organization to small-scale architectural details, based on the nature of the research object. Additionally, the study's temporal and spatial boundaries need to be established.

In the desk analysis phase, the overall goal is to identify specific elements that constitute the study area's urban form. This involves isolating different aspects of urban morphology and determining the specific element ranges that constitute each aspect in the study area. In most cases, this also involves examining the steps of their formation and transformation. The general steps in this stage include categorizing and evaluating the information based on the research object determined in the previous stage, refining specific analytical methods to achieve research objectives within the limitations of existing information and technology, conducting analyses, and producing results. In terms of research methods, four main analytical approaches are commonly used: plan analysis, textual analysis, quantitative analysis, and image analysis. Plan analysis is a powerful tool for analyzing urban organizational changes, while textual analysis, quantitative analysis, and image analysis are used for analyzing building form changes.

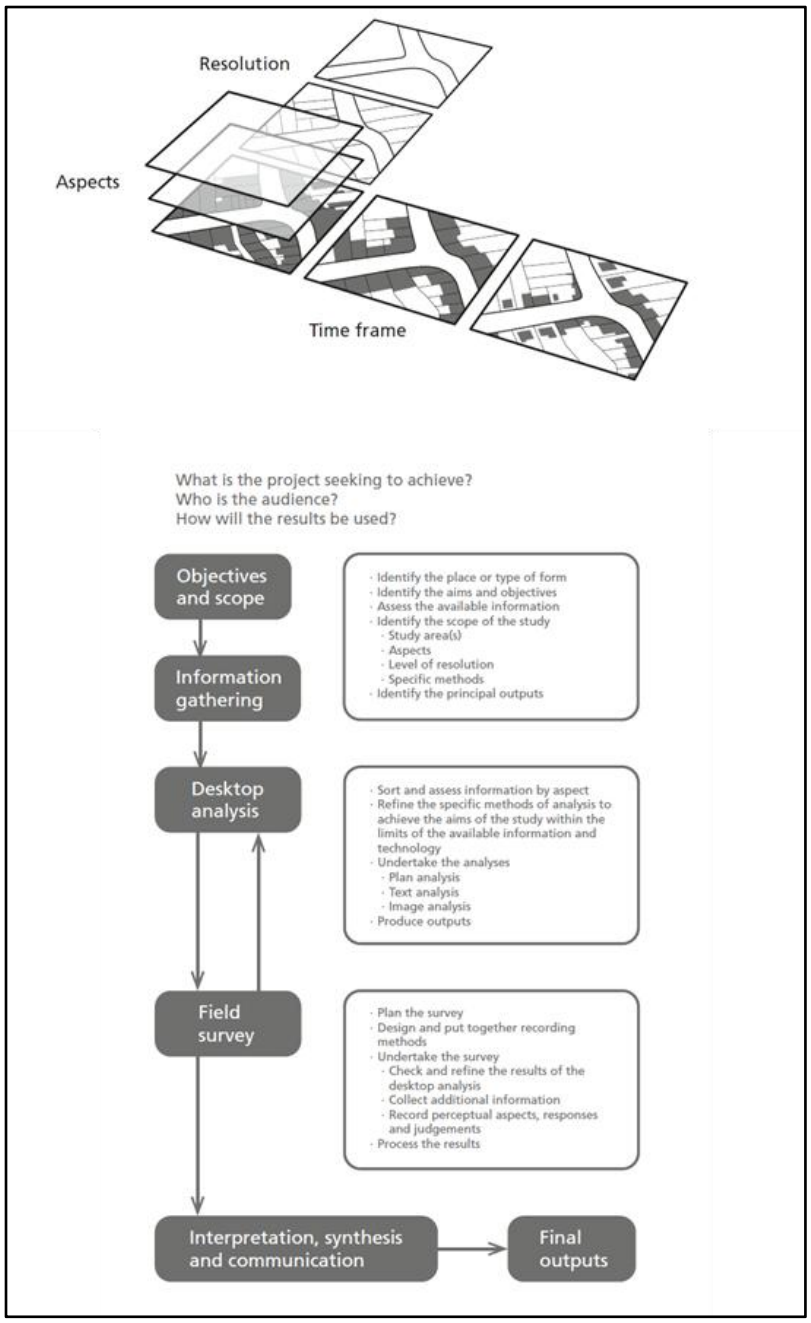

Figure 2-12 Kropf Proposed a Working Framework

（Source：Compiled by the author based on Kropf K. "*The handbook of urban morphology*"）

Field investigation is an essential part of the entire process and a necessary complement to desk analysis. It serves several purposes, including verifying and improving the results of desk analysis, collecting additional information about the research object that cannot be obtained from other sources, and recording perceptual aspects. The steps involved in field investigation include planning the investigation, designing methods for collecting and organizing data, conducting the investigation, and processing the results.

The synthesis stage is a critical component of most typomorphology research, aiming to visualize and seek an understanding of the relationship patterns among various urban elements that constitute the entire study area.

2.4.2.Chenfei’s Typomorphological Research Framework

Entering the 21st century, the International Seminar on Urban Form (ISUF) has attracted scholars from various countries to study and promote typomorphology. Chinese scholars, led by Chen Fei from the University of Liverpool in the UK, were the first to recognize the potential application of typomorphology research to address existing urban issues, protection, and revitalization in China, and they began their explorations in this area.

In 2008, Chen Fei's article titled "A New Research Framework: The Application of Urban typomorphology in China" [10]provided an overview of the Italian school of typology and the Conzenian school of urban morphology. He emphasized that the ultimate goal of comprehensive urban morphological research is to guide urban design and ensure that new creations are in harmony with local traditions and contexts. He acknowledged the effectiveness of typomorphology research methods and frameworks in the Western context and recognized the potential of applying typomorphology methods in China. However, he also pointed out that research frameworks in the Chinese context would inevitably require adjustments and adaptations to suit the unique characteristics of Chinese cities. Thus, based on the traditional typomorphology research framework, he proposed seven urban morphological elements, namely urban master plan, skyline, street network and streets, block, public space, public buildings, and residences. These seven urban morphological elements were extracted from traditional typomorphology research and are widely present in Chinese cities.

These seven urban morphological elements primarily reflect the concept of hierarchical analysis, mainly referring to the Italian school of typology that divides cities into different scales. The urban master plan and skyline belong to the city scale, the street network and streets as well as blocks correspond to urban areas; public spaces correspond to the block scale, and public buildings and residences belong to the building scale. It is evident that these morphological elements are mainly derived from Italian typology and Conzen's urban

morphology. The urban master plan, street network, and streets come from Conzen's city plan pattern division, while the distinction between public buildings and residential buildings comes from Caniglia's theory . In the urban morphology analysis part, the research mainly adopted Conzen's urban morphology analysis method, using map analysis to divide morphological regions. In the part of building and space types, the research mainly drew on the methods of the Italian school of typology, continuing to use those types that had undergone the typological process in the final new design to maintain consistency and adapt to the cultural context of the entire area.

The overall research framework is based on these seven morphological elements, encompassing three research processes.

The first process is the division of morphological regions, taking the urban master plan as an example, it includes the ancient city and the new area at the urban scale. Since public spaces and public buildings generally do not exist in morphological regions, the research directly enters the next phase.

The second step is typological analysis, which conducts stage-based analysis of types in different morphological regions according to different historical periods and extrapolates the typological process. In this step, the evolution process of types within a morphological region can be clearly identified, and whether the process is continuous or interrupted can be determined. Finally, the design guidelines are based on the study of the typological process. If the typological process within a region is continuous, the new design or intervention should follow the last stage of the typological process. If the typological process in a region is interrupted and currently at the interrupted stage, the design should continue from the point of interruption[9].

In conclusion, the research framework allows for the formulation of a series of urban design guidelines tailored to different morphological elements and regions, effectively transforming urban morphological analysis into urban design. Chen Fei also mentioned in the thesis that his typomorphology research framework covers scales ranging from individual buildings to the city level, and in practical applications, adjustments to the application framework are made according to the specific design scales.

7大要素	形态区域	类型			类型过程			设计指导
		阶段1	阶段2	阶段3	阶段1	阶段2	阶段3	
总平面	A：城墙内古城；B：新区	类型A	类型 A'	类型 A''	→	→	→	延续类型 A''；其他
天际线	完整天际线；	类型A	类型D	类型F	‖	‖	‖	延续类型C''，关注天际线的视觉质量；
	小尺度天际线	类型B	类型E	类型G	‖	‖	‖	其他
		类型C	类型C'	类型C''	→	→	→	
街道网络	根据网络类型A，B，C…	类型A；	类型A'；	类型A''；	→	→	→	在A区域延续类型 A''
		类型B；	类型B'；	类型E；	→	→	‖	在C区域延续类型D'；
		类型C；	类型 D；	类型D'	‖	→	→	在B区域响应类型E；
		…	…	…				其他
街道	同街道网络区域	类型a；	类型a'；	类型a''；	同街道网络类型过程			在A区域延续类型a''；
		类型b；	类型b'；	类型e；				在B区域响应类型e；
		类型c；	类型d	类型d'				在C区域延续类型d'
街区	根据街区类型，A，B，C…	类型A；	类型A'；	类型A''；	→	→	→	在A区域延续类型 A''；
		类型B；	类型B'；	类型E；	→	→	‖	在B区域响应类型E；
		类型C；	类型D；	类型D'	‖	→	→	在C区域延续类型D'；
		…	…	…				其他
地块	同街区形态区域	类型a；	类型a'；	类型a''；	同街区类型过程			在A区域延续类型a''；
		类型b；	类型b'；	类型e；				在B区域响应类型e；
		类型c；	类型d	类型d'				在C区域延续类型d'；
								其他
公共空间	独立存在，不存在形态区域	类型A	类型C	类型E	‖	‖	‖	延续类型 D；
		类型B	类型D	类型D'		→	→	关注空间质量
		…	…	…				
公共建筑	独立存在，不存在形态区域	类型A	类型A'	类型A''	→	→	→	延续类型A''；
		类型B	类型C	类型D	‖	‖	‖	回应类型 D
		…	…	…				
住宅	根据住宅类型 A，B，C…	类型A；	类型 A'；	类型 A''；	→	→	→	在A区域延续类型 A''；
		类型B；	类型 B'；	类型 E；	→	→	‖	在B区域响应类型E；
		类型C；	类型 D；	类型 F；	‖	‖	‖	在C区域延续类型F；
		…	…	…				其他

Figure 2-13 Chenfei's Typomorphological Analysis Framework

（Source：Compiled by the author based on Kropf K. "The handbook of urban morphology"）

2.5.Summary of This Chapter

In this chapter, the origins and developments of the two schools of typomorphology were first introduced. By examining relevant papers and research cases, the core methods of typomorphological research from both schools were outlined, and the characteristics of each method and the required tools were summarized.

In the latter part of this chapter, a comparison was made between the two schools regarding their research objects, scope, and tools. The Italian typomorphological method focuses on the perspective of building types, establishing connections between architectural forms and urban landscapes. On the other hand, the British Conzen's typomorphological method starts from the town's layout and analyzes the town's morphology through zoning.

Towards the end of this chapter, the latest developments in both schools were presented. Attempts by scholars to integrate the research methods of the two schools were listed, and an analysis of the comprehensive typomorphological research framework derived from both methods was conducted. Local typomorphological research frameworks were also taken into consideration, providing a reference for the application of typomorphological methods in

design.

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Chapter 3 Case Studies on the Application of Typomorphology

Typomorphology is a discipline that provides theoretical guidance for design practices. Its analytical research focuses on the physical form of cities, and its application is always tied to the manipulation of urban physical morphology. Therefore, the case studies in this chapter focus on the process of applying typomorphology analysis methods to address practical urban design issues, thereby clarifying the role of typomorphology in urban design. This chapter selects three case studies, including both classic applications of typomorphology methods and the latest achievements. These case studies offer valuable references for building a localized application framework.

This chapter selected Caniggia's residential area urban design as a case study to demonstrate the practical application of the typomorphological process typology method in urban design. Caniggia employed the classic process typology analysis to examine the local architecture's typological evolution and responded adaptively to new building designs. Through this case study, we can understand how the typomorphological analysis method is integrated into the design process.

Through the case study of Ménecy, we can comprehend the application of typomorphology in urban planning and management. In this case, a comprehensive set of urban design guidelines was formulated through a detailed investigation of the local historical form. Furthermore, through the case study of Santa Ana, we can discover that the typomorphological method is not only applied to building forms but also extends to shaping public spaces and street interfaces, offering guidance in multiple aspects. From this case, we can witness the latest applications of typomorphological ideas.

3.1.The Residential Area Project of The Genoa Costa degli Ometti

3.1.1.Urban Design Context

In 1982, Caniggia applied his process typology design approach to this residential project located in the Quinto district of Genoa, Liguria, Italy. Like many historical towns in the

Liguria region, the project was situated in a typical valley environment. To the north, there was a highway, and to the south, along the coastline, a road connected Genoa with various cities on the east coast. This project served as an exemplary exploration of the historical continuity of the cultural region.

After conducting a systematic analysis of the urban tissue and housing types in cities like Rome, Caniggia's understanding of the mechanisms behind urban fabric formation and the essence of housing type evolution became more mature. The project successfully incorporated the research on the Ligurian and Genoese housing typologies. The organic coordination of various interconnected scales permeated the entire design and construction process.

Figure 3-1 Satellite Map of Costa degli Ometti Residential Area

（Source：Compiled by the author based on Google Earth）

3.1.2.Typomorphology Applied in Building Typology Analysis

Caniggia first conducted a typology analysis of the row houses in Genoa. His analysis indicated that many ancient Italian cities still preserved the building types from Roman times. The characteristic feature of this type was that houses were located on one side of a closed block, which influenced the subsequent development of Italian residential buildings[17]. Later scholars divided Italian urban residential architecture into two stages: the medieval period and the mid-19th century to the 1930s.

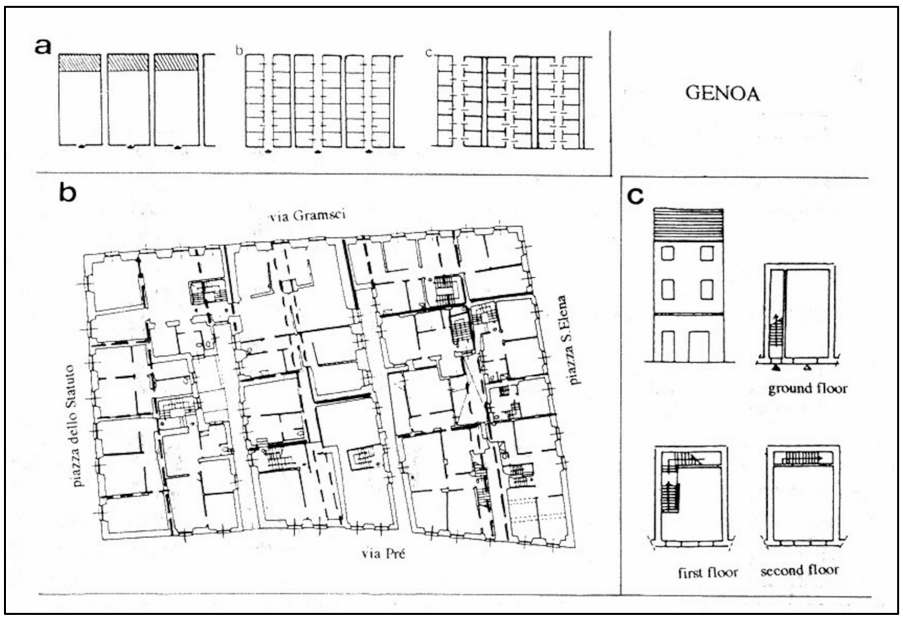

Figure 3-2 Medieval Residential Building Types in Genoa

（Source：Compiled by the author based on Corsini M G. "Residential building types in Italy before 1930"）

In medieval Genoa, the dominant residential buildings were single-room houses. The characteristic feature of this type was that these single-room buildings shared three walls with adjacent houses, directly facing the street without their own courtyard or garden. The width of the street-facing opening was 4-7 meters, and the depth was 5-8 meters. The ground floor had two independent entrances: one leading to the street and the other, a stair entrance, leading to the living room and bedrooms. The ground floor entrance was perpendicular to the direction of the opening, while the upper floor stairs were parallel to the opening and closely attached to the walls[28].

From the mid-19th century to 1930, newly constructed apartment buildings inherited the characteristics of the original medieval architecture in Genoa. Whether facing the street or independent, these apartments retained the layout of the old city, typically arranged in a three-bay configuration. The entrance hall was located in the central bay, while the important rooms were situated along the street-facing facade, and other functional rooms were positioned at the back of the building.

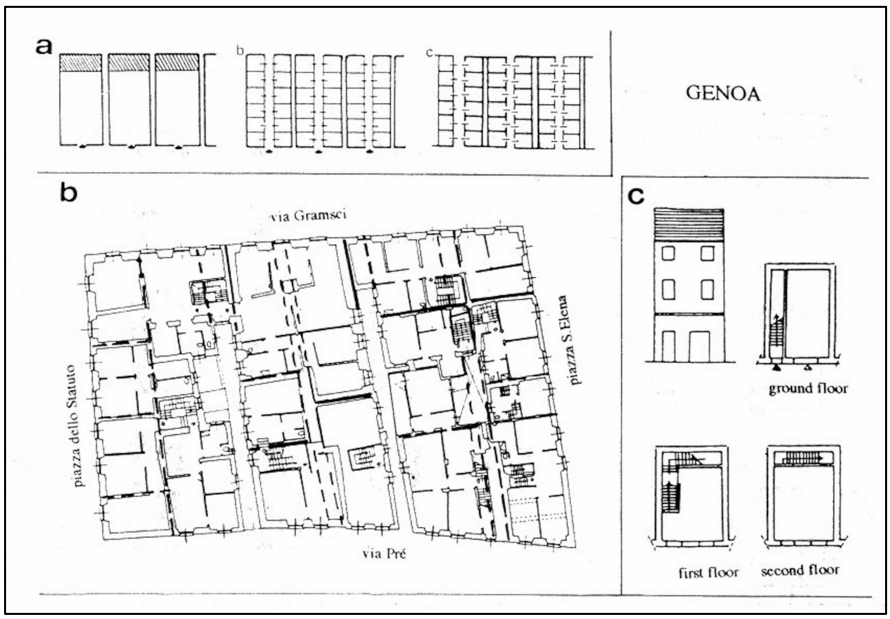

Figure 3-3 Genoa's mid-19th-century Residential Building Types.

（Source：Compiled by the author based on Corsini M G.“Residential building types in Italy before 1930”）

3.1.3.Typomorphology Applied in Urban Design

In Caniggia's urban design, based on the previous stage of process typology analysis, the characteristics of Genoa's classical residential buildings were summarized in terms of plot layout, building plan layout, and building facade forms. In the design process, responses were made to Genoa's classical residential building types from different scales[29].

（1）Design at the Urban Scale

Each house in the project is connected to the street and responds to the shape, scale, and position of the plot within the built environment. The residential units adopt a row house typology, characterized by compact dimensions and easily controllable facade sizes, allowing them to flexibly adapt to various plot depths and floor levels. Apartments adjacent to squares, special "nodes," or main pathways have their ground floors transformed into public spaces. The design makes use of the varying heights of the plot to create private entrances for each individual dwelling. Parallel streets located on elevated platforms at the second-floor level provide these apartments with such private entrances, enabling the settlement to harmoniously integrate into the environment and produce numerous layout variations in response to the terrain. The constructed urban fabric maximizes the use of the sloping terrain, forming a harmonious relationship with the layered mountainous landscape to the east.

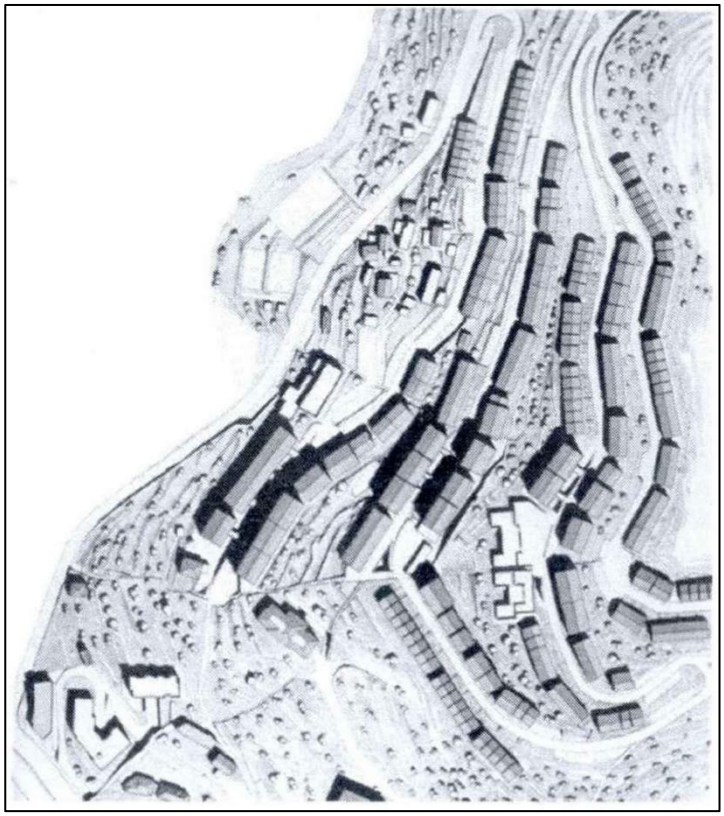

Figure 3-4 The Master Plan of the Costa degli Ometti Project.

（Source：Compiled by the author based on the book “*Regional architecture in the Mediterranean area*”）

（2）Design at the Building Tissue Scale

The modular dimensions of the houses are derived from the sizes of historical housing units in Genoa and depend on the slope and position of the hillside. The width of the houses ranges from approximately 4.5 to 6 meters, and the depth varies from single-unit to double-unit dwellings. The houses conform to the layout of the terrain along the rocky ridge and preserve the traditional load-bearing stone walls with a history of thousands of years.

For the house types, low-density row houses and terraced houses are chosen. The living rooms are located along the street-facing part of the houses, while the kitchens and bathrooms are at the back, echoing the building style of the mid-19th century. Similar to historical towns, the partition walls of the houses are oriented along the depth of the plot, allowing for flexible variation of the unit space module to adapt to the depth of the plot or site[30].

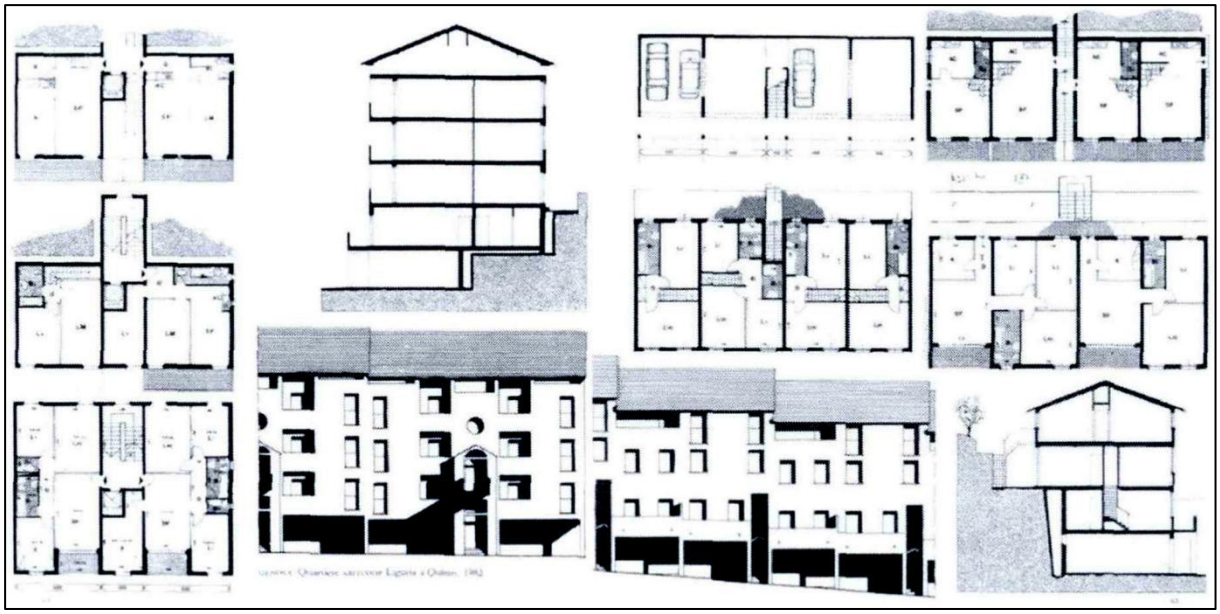

Figure 3-5 The Building Design of the Costa degli Ometti Project.

（Source：Compiled by the author based on the book “*Regional architecture in the Mediterranean area*”）

（3）Design at the Building Detail Scale

The respect for local building traditions is also reflected in the structure, components, and materials of the houses. Especially, the use of stone slabs as roof stairs and decorative materials embodies the traditional materials with a history of thousands of years in Liguria. Similar to the window openings in traditional local residences, most houses have a window on the door to provide light for the entrance and stairs. The main doors are constructed simply with wood.

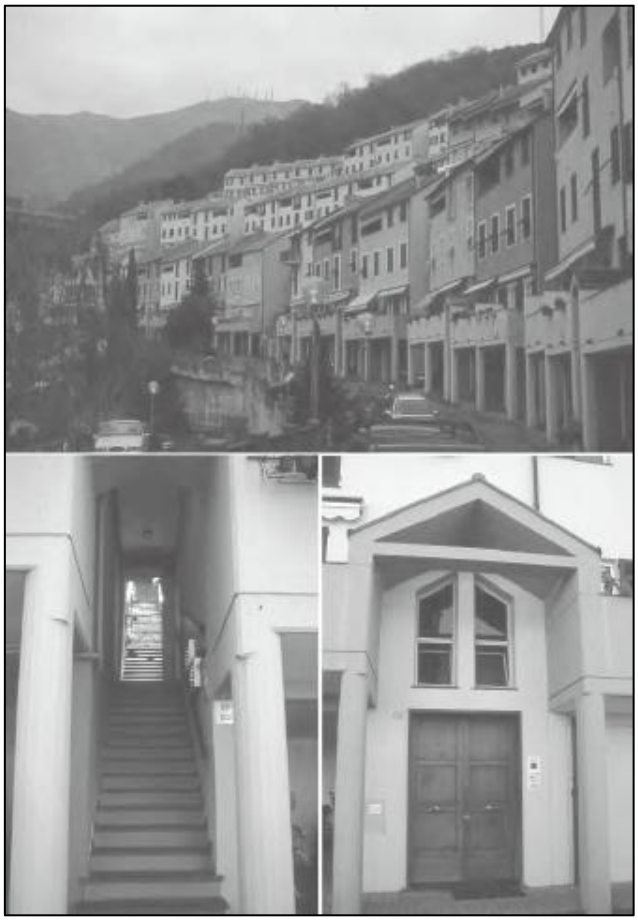

Figure 3-6 The detail Design of the Costa degli Ometti Project.

（Source：Compiled by the author based on the book “*Regional architecture in the Mediterranean area*”）

Regarding the facade design of the houses, typical Ligurian components such as blinds are used as decorative elements. A set of component color schemes and a selection table for doors and windows are specifically designed for the residents to choose from. This enhances the individuality of each house, avoiding monotonous and uniform design, and creating a harmonious and unified overall appearance for the entire area, where each unit retains its unique characteristics, leading to a completed state that closely resembles a naturally formed settlement morphology.

The residential area is a unified integration of human construction activities at various levels in the regional planning. In this project, Caniggia put his theories into practice and validated concepts related to the evolution of housing types and mountain hamlet development processes. It incorporates modern design techniques while preserving distinct regional characteristics, carrying forward the urban center's fabric and housing features. This successful attempt exemplifies how Caniggia's theoretical framework guides practical urban

design.

3.2.The Plan for The Asnires-Sur-Oise

3.2.1.Planning Context

Asnires-Sur-Oise, also known as Ménecy, is a town nestled in the southern part of France, surrounded by lush landscapes and historical charm. Situated approximately 40 kilometers from the bustling city of Paris and 20 kilometers from Orly International Airport, Ménecy enjoys convenient transportation connections through various urban roads and railways. Over the years, it has evolved into a vibrant satellite city, attracting a growing number of commuters seeking a tranquil retreat with easy access to metropolitan opportunities（Figure 3-7）.

The town's development has not been without its challenges, particularly in the face of rapid urbanization and population growth. The real estate industry has flourished, giving rise to numerous new residences and infrastructures to accommodate the expanding population. While the influx of new constructions has brought economic prosperity and modern conveniences to the area, it has also raised concerns about preserving Ménecy's unique historical and cultural heritage.

As urbanization progressed, old buildings were extensively demolished, making way for modern structures that paid little homage to the town's rich history and traditional urban morphology. This lack of consideration for the existing urban fabric and historical symbols led to the gradual erosion of Ménecy's distinctive historical features. The need to strike a delicate balance between modernity and heritage preservation became increasingly apparent.

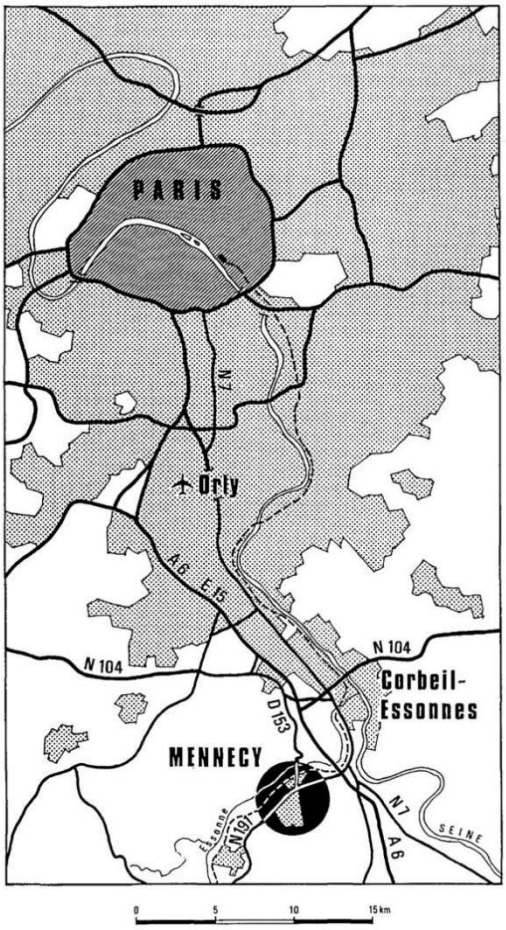

Figure 3-7 The Location of the Ménecy

（Source：Compiled by the author based on Kropf K S. An alternative approach to zoning in France: typology, historical character and development control）

3.2.2.Typomorphology Applied in Morphological Zoning

To embark on this transformative endeavor, a multidisciplinary team of architects, urban planners, historians, and researchers was assembled. Their mission was to conduct a comprehensive investigation of Ménecy's morphology and typology, delving into historical maps, land records, and conducting on-site surveys. This initial step aimed to identify various hierarchical elements that shaped the town's urban fabric, including streets, plot series, plots, buildings, building spaces, building structures, and building materials. Through meticulous analysis and documentation, the team sought to gain a profound understanding of the spatial organization and historical evolution of Ménecy.

The typomorphological zoning process involved the identification of seven distinct areas,

encompassing four types of urban regions and three types of natural landscapes. Each area was thoughtfully delineated based on its historical significance and unique morphology, and specific guidelines were formulated for building morphology within each region. This approach enabled the team to curate a comprehensive map of Ménecy's urban fabric, serving as the blueprint for subsequent planning decisions.[8]

Instead of the conventional functional separation approach, which often neglects the historical context, typomorphological zoning allowed for a more holistic approach to urban planning. By considering the historical and cultural significance of each area, the team ensured that Ménecy's past and present would seamlessly intertwine to create a sustainable future.

The central area, characterized by its historical significance and cultural landmarks, was meticulously protected through strict regulations. The morphology of land parcels, the scale of constructions, and even the areas where new developments were permissible were carefully specified to maintain the town's unique charm. Beyond preserving historical sites, typomorphological zoning extended to future developments, with a library of choices for building coverage and morphology provided to architects and developers. This approach facilitated the harmonious integration of new structures into the existing urban fabric while respecting Ménecy's historical identity.

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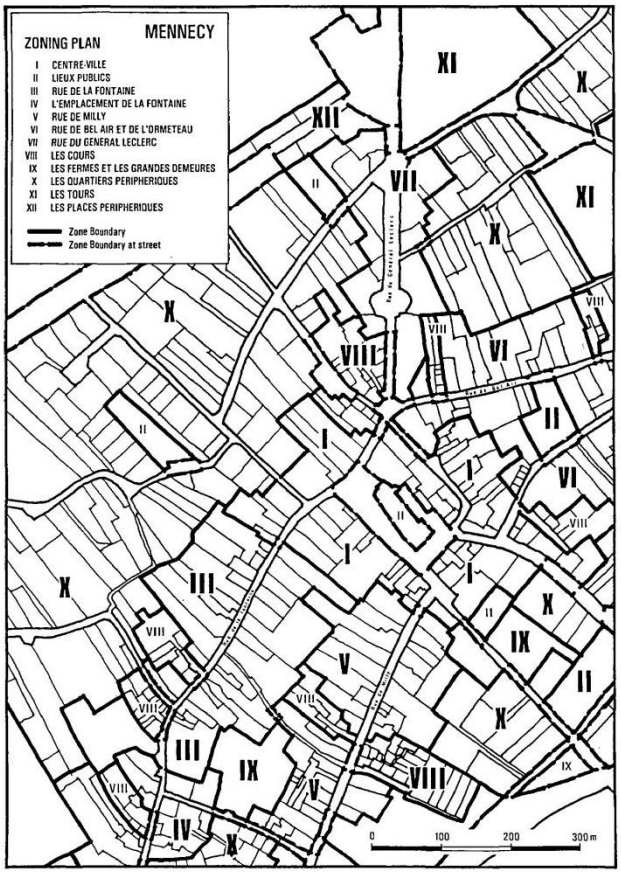


Figure 3-8 Part of a Proposed Zoning Plan for the Centre of Ménecy

（Source：Compiled by the author based on Kropf K S. An alternative approach to zoning in France: typology, historical character and development control）

This method involves typomorphological zoning instead of traditional functional separation, resulting in the identification of seven areas: four types of urban areas and three types of natural areas. For each area, acceptable and unacceptable building morphology are specified. Through the analysis of these elements, the team obtained the urban fabric of the Ménecy region and used it as the basis for planning, including land unit zoning such as the central area, public areas, street surroundings, farms, tower blocks, etc. Subsequently, control and management regulations were developed for each planning unit.

3.2.3.Typomorphology Applied in Planning Management

By conducting typomorphological zoning for the small town, specific control and management regulations were formulated for each planning unit. For instance, detailed requirements were specified for the morphology of the central area's land parcels, the scale of

the parcels, and the areas within the parcels where construction is allowed[31].

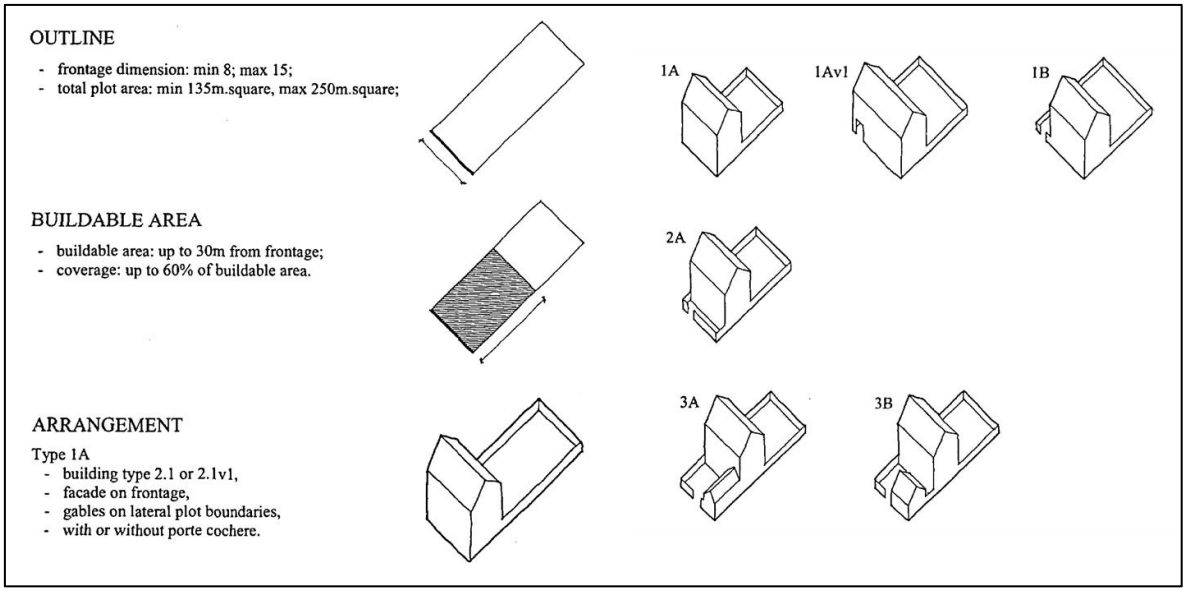


Figure 3-9 Example of Regulations for Plots from the Centre Ville Zone.

（Source：Compiled by the author based on Kropf K S. “An alternative approach to zoning in France: typology, historical character and development control”）

Additionally, options for building coverage and building morphology were provided through a library of choices. If there is a need to construct new buildings within a certain planning area in the future, their proportions, dimensions, and layout patterns must conform to the permitted building sizes and layouts for that area. This planning management practice exemplifies the practical application of typomorphology.

3.3.The Specific Plan of Santa Arena Renaissance

3.3.1.Planning Context

The city of Santa Ana is located in Orange County, California and is one of the largest cities in the county. However, over the years, the Santa Ana downtown area has faced a series of challenges, including high unemployment rates, increasing crime rates, aging infrastructure, and community blight. In response to these challenges, the city of Santa Ana has decided to undertake a comprehensive revitalization plan to improve urban development and enhance the quality of life for its residents[32].

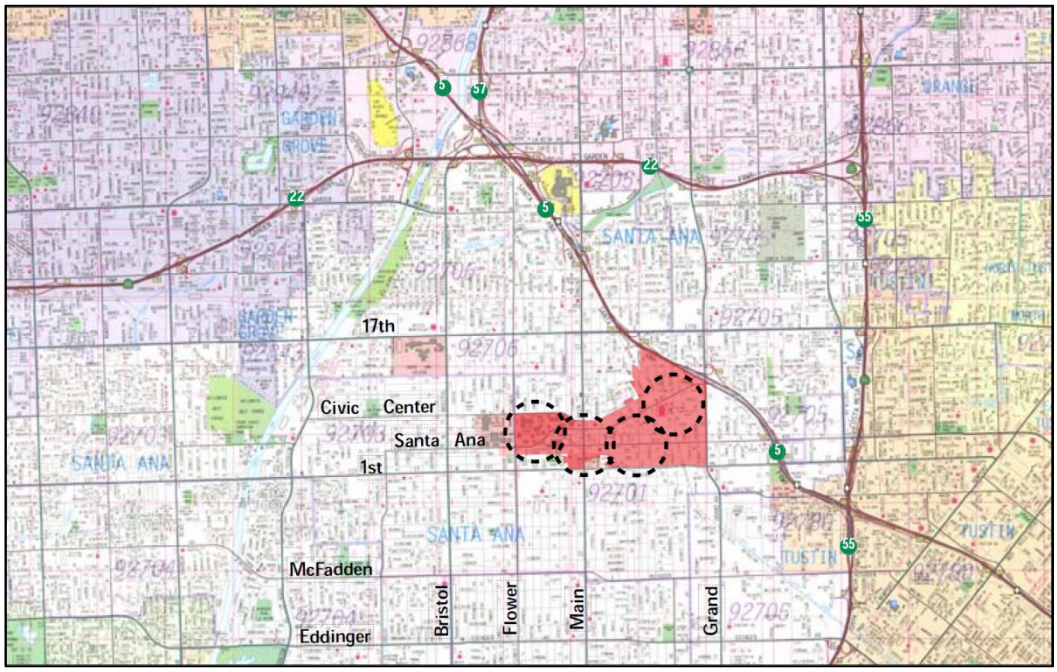


Figure 3-10 Three Districts and Three Neigh-borhoods Comprise Santa Ana's Core as a Mature（Source：Compiled by the author based on “Santa Ana Renaissance Specific Plan”）

3.3.2.Typomorphology Applied in Building From Guidelines

The building type regulations in this guideline are the most developed and comprehensive standards in the American morphological guidelines. Based on the compilation of documents, all twelve building types are depicted, including tower with podium, slab building, mixed-use courtyard, commercial block, multi-story apartment, courtyard housing, industrial plant, live-work, townhouses, two-bedroom/three-bedroom/four-bedroom, and single-family residential building types.

Figure 3-11 The Classification of Building Types in this Area.

（Source：Compiled by the author based on “Santa Ana Renaissance Specific Plan”）

In the morphological guidelines, specific regulations regarding the street facade types are still included. In addition to determining appropriate street facade types, each type is detailed with descriptions of suitable quantity and proportion standards.

From the morphological design guidelines, we can observe the latest application of typomorphology. In the context of arcade building architecture, the guidelines provide detailed controls over the openness of the ground-level space and the size of internal interfaces. They also emphasize the integration of archways with the overall building structure in architectural form. Additionally, the guidelines include specific dimensional specifications, which are expressed through axonometric diagrams and accompanied by photographs of typical buildings. This combination of visual representations allows the unique architectural form of archways to be easily understood, thus greatly aiding the effective implementation of the guidelines.

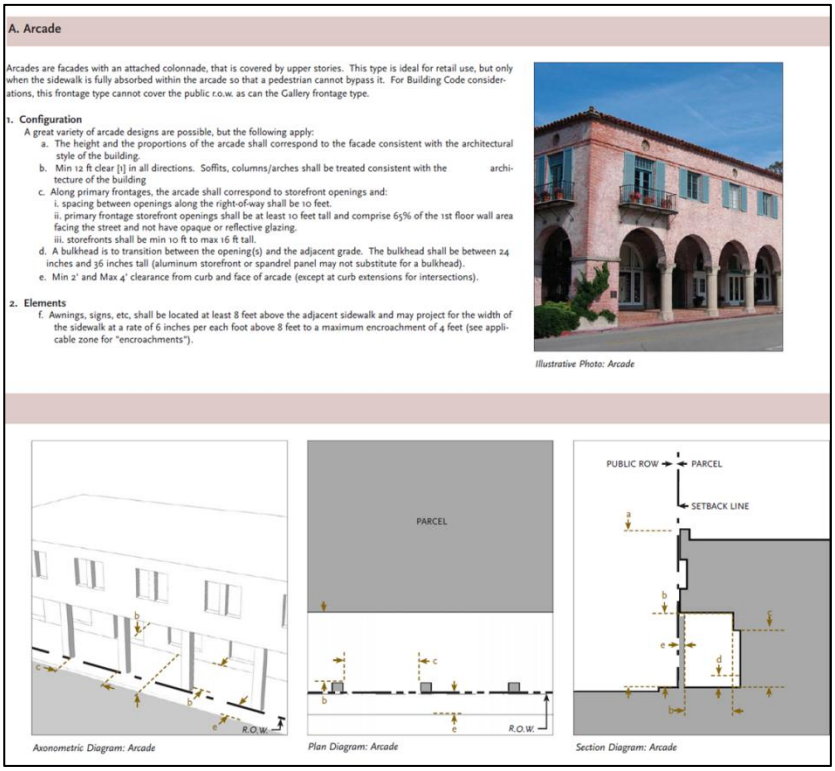


Figure 3-12 Detailed Morphological Design for Public Spaces.

（Source：Compiled by the author based on “Santa Ana Renaissance Specific Plan”）

3.4.Summary of This Chapter

This chapter primarily conducts in-depth research on typomorphology cases, categorizing them into practical applications and technical achievements. It clarifies the application of typomorphology analysis theory in practical urban renewal and conservation planning, and outlines the results of related morphological design guidelines.

Chapter 4 Construction of a Localized Adaptation Framework

The typomorphology theory in Europe has its own application context, and in its theoretical application, it is important to focus on the theoretical application context and the application environment. This chapter, through the analysis of the application conditions of typomorphology theory and considering the actual situation of the local research objects, aims to clarify the research objectives. With an understanding of the research constraints, a localized working framework is constructed to adaptively modify the typomorphology method for local application.

4.1.Defining the Scope of the Research

4.1.1.Research Site

As one of the most prosperous commercial streets in modern times, the Long Bund in Guangzhou served as an experimental base for the earliest construction of arcade buildings and a major demonstration area for the subsequent development of the arcade system. As early as 1889, the then official Zhang Zhidong proposed the initial concept of arcades. Over the following decades, the Long Bund arcade street evolved into a series of distinctive arcade buildings, among which the high-rise and large-scale arcade buildings formed a unique building form on the site. Moreover, the area is still undergoing continuous construction and development, and in different eras, it has responded to the existing arcade architecture on the site[34].

Figure 4-1 The Building Image of the Long Bund along the Riverbank.

（Source：Photographed by the author）

4.1.2.Research Subject

The arcade buildings in Guangzhou, representing the Cantonese building style, emerged in the early 20th century and exhibit diverse morphology while being well-preserved. The characteristic feature of Guangzhou's arcade buildings is the expansion of the porch to form continuous street corridors. The upper level houses the residential floors, while the lower level is open towards the street on one side and consists of storefront windows on the other side, allowing customers to freely browse merchandise along the corridors. The upper floors are generally used for residential purposes. The arcade buildings provide shelter from wind and rain, and protection from the intense sunlight, making them well-suited for the subtropical climate of South China. The shops within the arcades can utilize the space under the arcade columns, facilitating open storefronts for displaying merchandise and attracting customers[35].

Due to their partial inheritance of the bamboo house[39], most arcade buildings always face the main roads of the city. Thanks to the arcade system, arcade buildings have become a significant building type in Guangzhou, resulting in numerous arcade streets throughout the city. The arcade streets are characterized by rows of interconnected arcade buildings along the street facades, forming a distinct urban landscape that has become a unique feature of Guangzhou's cityscape. While there have been many studies on the architectural features and

styles of Guangzhou's arcade buildings, there is still a lack of research on the overall form of arcade streets composed of arcade buildings. The application of the typomorphology theory can effectively address this gap and thus the analysis will focus on the urban tissue formed by the arcade streets as the primary urban element.

Figure 4-2 The Building Image of the Long Bund Arcade Street.

（Source：Photographed by the author）

4.1.3.The Time Span of the Research

Based on the important regulations governing arcade buildings in Guangzhou and the characteristics of changes observed in the architecture of the Long Bund arcade, the overall evolution of the arcade street's morphological features is divided into six historical stages. These stages are determined as follows:

（1）The Origin Stage (1900-1910):

The official prototype of arcade buildings was provided by Zhang Zhidong's initial concept for the Long Bund[39], defining the origin of arcade buildings. The first regulations related to arcade buildings were established during this period, formally defining the concept of arcade buildings.

（2）The Initial Stage (1910-1920):

During this period, arcade buildings saw their initial development and the establishment of significant arcade buildings such as Chengwai Daxin Company and Aiqun Hotel,

representing the development and maturity of arcade building technology and aesthetics.

（3）The Development and Maturity Stage (1920-1930, 1930-1940):

This period witnessed the continued development and maturation of arcade buildings.

（4）The Decline Stage (1940-2000):

The period when the construction of arcade buildings declined, marked by the cessation of the arcade building system.

（5）The Redevelopment Stage (2000-2023):

This stage represents the revival and redevelopment of arcade building types, evident in the appearance of buildings with similar arcade-like morphology along the Long Bund in recent years.

4.1.4.The Problem of the Site

As the epitome of the development of Guangzhou's riding-store culture, the riding-store buildings of Changdi Avenida have experienced the climax of Guangzhou's historical development of riding-store, and are rich in historical value, which should be explored. But nowadays, the riding street of Changdi Avenida is facing different aspects of decline.

For the urban decline problem faced by Yanjiang West District, there have been thesis related research to "the study of the urban decline of the old city center area - Guangzhou Yanjiang West area as an example" as the first, will be along the western part of the Yangtze River West District, Cheung Tai Avenues along the decline of the cycling tower neighborhoods are categorized as two major They are the decline of the physical form of the city and the decline of the non-physical form.

Among them, the decline of the physical form of the city mainly includes the aging of buildings, unclear interpretation of building property rights, the decline of the culture of the Riding House, the historical characteristics that have yet to be explored, the scarcity of green space and open space, and the overall poor quality of the landscape.

The aging of buildings is mainly manifested in the fact that along the western part of the river, the urban texture of the old city development is mainly preserved, and the overall urban environment reflects the high density of the ground floor, and the situation of building additions is also more common, and the overall urban environment is more crowded. Due to

the development of the city, many buildings have been replaced by modern buildings, which makes the original interface of the buildings not continuous, and due to the old age of the buildings in the site, the exterior walls of the buildings have different degrees of deterioration, and the later restoration of the buildings is often not unified with the original style of the buildings.

Figure 4-3 The Building Image of the Long Bund Arcade Street.

（Source：Photographed by the author）

The decline of the riding building culture is mainly manifested in the fact that the characteristic riding building buildings need to be repaired, the lack of a spatial environment suitable for their protection and development, and the failure to fully explore the inherent historical and cultural connotations of the riding building to sublimate it into a landmark landscape along the western part of the river. At the same time, the authors of the paper also made a questionnaire survey on the western area along the river, which showed that people's perceptions of the Riding Mansions have generally declined.

Figure 4-4 The Building Image of the Long Bund Arcade Street.

（Source：Photographed by the author）

Historical characteristics have yet to be explored, as shown in the fact that Yanjiang West used to be the gathering place of Guangzhou's old businesses, such as Dasan Yuan Restaurant, Haizhu Theatre, Aiqun Mansion, Nanfang Mansion, etc., which are highly recognized and are the historical carriers of the city's culture and characteristics, and are also the key objects to be

protected in the city's historic districts. However, in recent years, the old restaurants in the area along the west side of the river have suffered from poor management and decline, and the architectural and material cultural resources of the area along the west side of the river have not been well utilized and developed.

Figure 4-5 The Building Image of the Long Bund Arcade Street.

（Source：Photographed by the author）

At the same time, the decline of the western region along the river is also manifested in the non-material form of decline, which are, respectively, the decline of the commercial function, the aging of the population composition, and the reduction of investment. With the improvement of the market economy system, the living standard of the urban residents is improving, and the requirements for the quality of life are also improving, but the commercial development along the west side of the river has not kept up with the growing material and cultural needs of the urban residents, the author of the thesis on the South Building as an example, the research of the South Building sixty years of business data, showing the South Building from the splendor of the process of decline, and also reflects the South Building's positioning, It also shows that the positioning, grade operation and development scale of Nanfang Mansion cannot adapt to the needs of the public and the market development. At the same time, along the west side of the river, the area is also facing a young population moving out and the proportion of middle-aged and old people is increasing. And due to the requirements of urban residents for the living environment, this low-rise, high-density living style has lost its attraction to the middle and high-income classes, reducing the need to upgrade the services of the western region of the river, and due to the complex urban environment of the western region of the river, real estate developers have always been in a relatively conservative state of investment in this area, and the refurbishment of Avenida Long

Beach basically comes from the government project.

	1997 年	1998 年	1999 年	2000 年	2001 年
全国统计大型商场个数	15	15	20	28	25
总销售额（亿元）	69.81	71.03	71.80	100.77	107.39
南方大厦百货商店销售额（亿元）	5.91	4.80	3.97	3.41	2.16
增长率	—	-18.73%	-20.97%	-9.99%	-36.65%
排名	—	6	7	12	17
市场占有率	8.47%	6.76%	5.53%	3.38%	2.01%

Figure 4-6 Turnover figures of Southern Building from 1997 to 2001

（Source：Compiled by the author based on “Study on Urban Decline of Old City Center Area--Taking Guangzhou Yanjiang West Area as an Example”）

	1998 年	1999 年	增长率	2000 年	增长率	2001 年	增长率	2002 年	增长率
越秀区	5.79	5.97	55.8%	4.99	-16.4%	6.15	23.2%	2.19	-64.4%
东山区	2.74	5.02	68.6%	5.48	9.2%	6.33	15.5%	5.94	-6.2%
荔湾区	3.14	2.37	-15.3%	2.5	5.5%	3.67	46.8%	4.27	16.3%
海珠区	2.85	2.54	-279.3%	4.24	66.9%	5.92	39.6%	5.89	-0.5%
天河区	10.5	7.2	-26.4%	8.46	17.5%	13.75	62.5%	14.86	8.1%
白云区	9.97	7.6	76.2%	7.89	3.8%	11.1	40.7%	—	—

Figure 4-7 Investment in real estate development in central Guangzhou from 1998 to 2002 (billion yuan)

（Source：Compiled by the author based on “Study on Urban Decline of Old City Center Area--Taking Guangzhou Yanjiang West Area as an Example”）

4.2.The Application of Typomorphology in a European Context

4.2.1.Application Background

The typomorphological analysis method in urban planning and redevelopment in European cities is closely intertwined with its own natural, historical, and cultural background. The influence of these backgrounds is also evident in the characteristics of European urban form and the development concepts and patterns. These application contexts need to be clearly understood first when conducting research on the localization and adaptability of this technology. Below, we will take Italy as an example to analyze why typomorphology analysis

method can be applied to the preservation of historical cities in Italy.

（1）The Cultural and Geographical Background of Italy:

Typomorphology's application in Italy is closely intertwined with the country's unique cultural and geographical context. Italy's urban form and building characteristics have played a pivotal role in the emergence and development of Italian typomorphology. The utilization of typomorphology research methods has further safeguarded the distinctive features of Italian urban morphology. Understanding this historical background is essential in establishing an adaptive framework for typomorphological analysis.

（2）Italy's Mountainous Geography and Independent Historical Towns:

Italy's predominantly mountainous terrain has contributed to the formation of independent historical towns. In urban development, clear boundaries often exist between new and old towns, facilitating the identification of historical urban areas from different time periods. This geographical setting has preserved the authenticity and uniqueness of each historical town, making them valuable subjects for typomorphological analysis.

（3）Precise Mapping of Urban History:

Italy has a strong tradition of accurately mapping urban history, providing valuable resources for the preservation of city history. Landmark examples include Nolli's map of Rome in 1748 and Muratori's map of Venice. These detailed representations of urban elements offer valuable insights into the evolution of urban form and serve as a crucial basis for typomorphological research.

（4）Vibrant Tradition of Historical Building Preservation:

Italy has a vibrant tradition of preserving historical buildings, and the country has been actively engaged in debates on urban history preservation throughout its history. This dedication to safeguarding architectural heritage has led to the development of a mature approach to architectural historical preservation in Italy. The preservation of historical buildings and urban areas has provided ample opportunities for typomorphological studies and contributed to the comprehensive understanding of the Italian urban fabric.

（5）Maturity of Italy's Approach to Architectural Historical Preservation:

Over the years, Italy has developed a mature and well-defined approach to architectural historical preservation. This approach encompasses a range of conservation strategies,

including restoration, reconstruction, and adaptive reuse. Such preservation practices have not only protected the physical structures but have also upheld the cultural and historical significance of Italian cities, offering a fertile ground for the application of typomorphological research.

（6） Legacy of Urban History Protection:

The dedication to preserving urban history in Italy has left a profound legacy for future generations. The meticulous documentation and protection of historical urban areas have created a solid foundation for researchers and urban planners to delve into the complexities of typomorphological analysis. The legacy of urban history protection inspires scholars to explore new avenues in typomorphology, ultimately enriching the understanding of Italian urban evolution and providing valuable insights for contemporary urban planning and development.

4.2.2.Application Conditions

One of the important goals of typomorphology research is to find connections between the past, present, and future. Maps and documentary materials serve as crucial foundations for historical research. The Conzenian school, based on comprehensive and detailed historical maps and urban construction data of British cities, distinguishes different morphological areas within the city and analyzes the process of urban evolution. On the other hand, Italian scholars like Muratori and Caniggia create "speculative typological maps" of different periods based on archaeological maps and other historical records, conducting evolutionary studies through comparison with current maps.

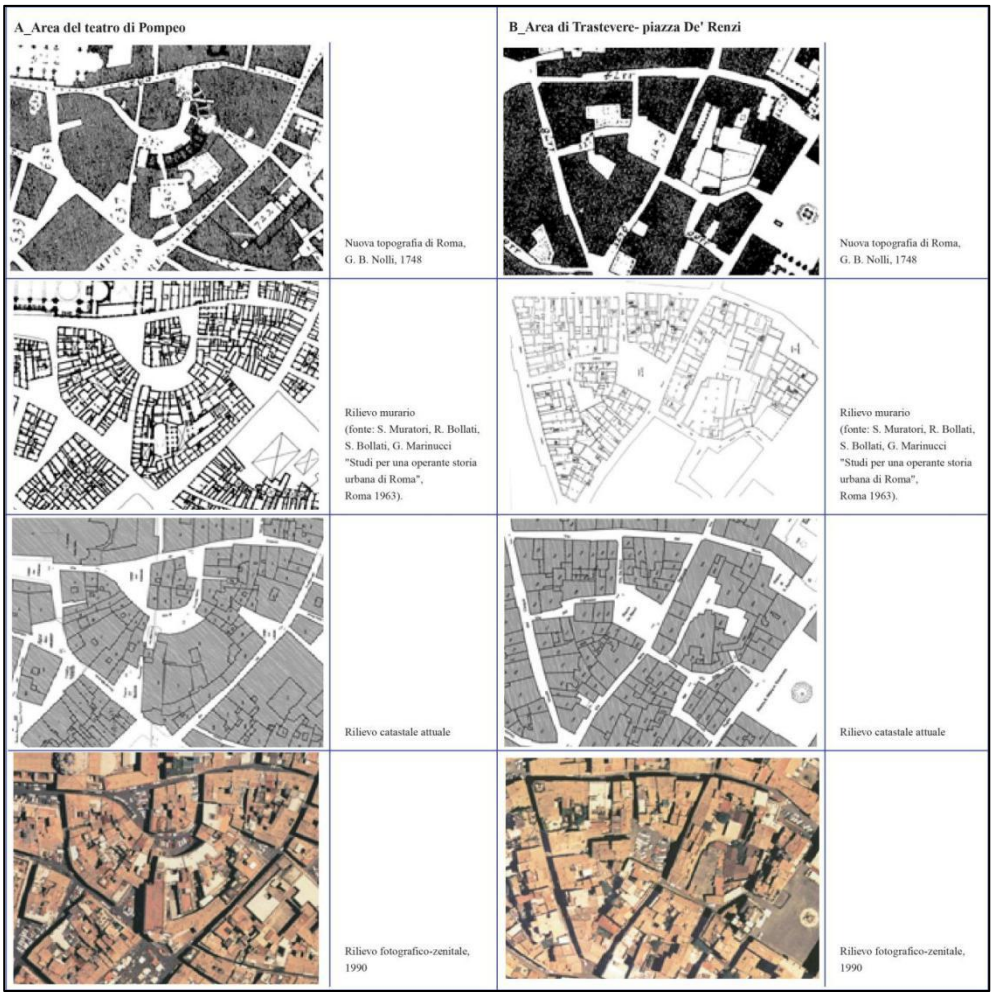


Figure 4-8 Different Maps Record the Urban Morphology of Different Historical Periods.

（Source：Compiled by the author based on“Piano Regolatore Generale di Roma, 2008”）

However, the effective application of typomorphology planning techniques in Italy heavily relies on the availability and accuracy of historical maps and comprehensive information. Lack of historical maps or insufficient coverage and precision in maps can severely impact the efficient utilization of typomorphology planning techniques and compromise their effectiveness. Therefore, the successful implementation of Italian typomorphology planning techniques requires reliable historical map resources and relevant historical information.

4.3.Research on the Localization of the Technology

4.3.1.Application Potential

Starting from the late 1980s, the theories of Italian typology and British urban

morphology gradually spread to China. With the 16th International Forum on Urban Morphology held in Guangzhou in September 2009, more scholars began to pay attention to the interpretation and application of this Western theory in China.

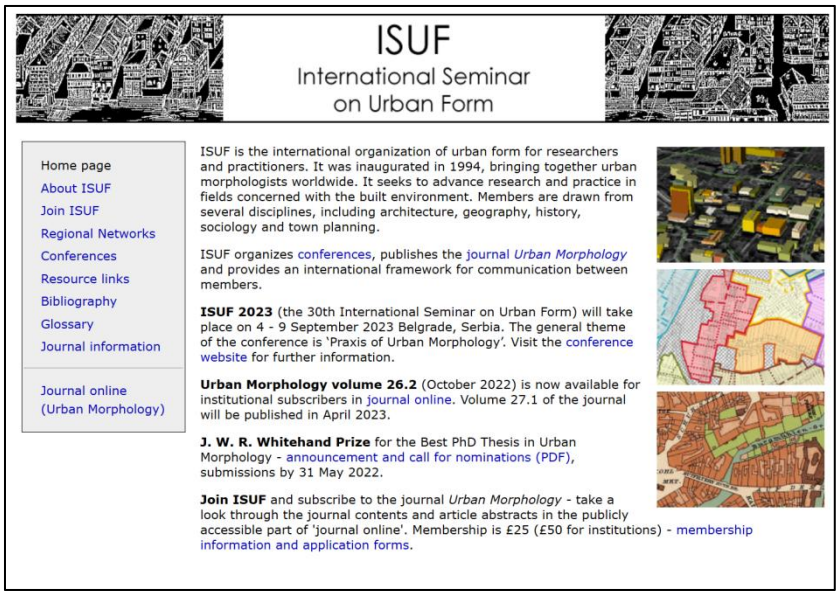


Figure 4-9 ISUF Website

（Source：Compiled by the author based on Internet Information）

In the past 30 years, with the acceleration of urbanization and internationalization, Chinese cities have undergone significant changes. Due to the widespread demolition of traditional buildings and the appearance of new constructions lacking regional characteristics, many historically significant ancient cities have gradually lost their cultural uniqueness, and regions have become more homogeneous. The key to addressing this issue lies in how to inherit the essence of tradition and establish a connection between new morphology and traditional morphology in the context of rapid development. Western typomorphology studies place great emphasis on the historical evolution of morphology, demonstrating that morphology development is a gradual process intricately linked to history. Introducing the ideas of typomorphology can provide a fresh perspective for the protection of historical towns in China.

4.3.2.Application Difficulties and Solutions

The research of typomorphology, a field deeply rooted in the construction context and cultural traditions of Western cities, presents unique challenges and opportunities when

applied to traditional Chinese cities. As China underwent significant political, economic, and cultural reforms after the establishment of New China, urban development boomed, and the urban form underwent profound transformations. This necessitates a thorough understanding and analysis of the issues and challenges involved in localizing typomorphological theories and methodologies to suit the historical areas of Chinese cities.

（1）Application Difficulties

The research of typomorphology is usually based on maps and documentary materials from different historical periods. After the Renaissance, European countries saw significant improvements in cartography due to enhanced scientific knowledge, the invention of perspective drawing, and the emergence of new measurement tools. For example, in countries like England, systematic and comprehensive map surveying began in the 19th century, continuously updating the survey results and achieving high precision in mapping buildings, streets, and plots, thus providing complete historical geographic information for urban research. However, in China, urban maps and documentary materials are not as complete and detailed as those in European cities, posing a challenge for creating typological maps. In ancient China, since the Western Jin Dynasty, scholars like Pei Xiu proposed relatively scientific methods for surveying and mapping, laying the foundation for modern maps. However, many traditional Chinese city maps were not "seriously" drawn according to cartographic requirements; instead, they followed a pictorial approach resembling landscape paintings.

The traditional maps did not have a consistent scale and were drawn in an elevation format, depicting the terrain, city walls, and iconic buildings such as palaces, government offices, and temples. These maps were annotated with textual descriptions, and the sizes of major structures were often exaggerated, while other neighborhoods and markets were either simplified or omitted. These maps focused on illustrating the relationships between the city and its surrounding environment and various elements within the city, expressing "power, responsibility, and emotions," but they could not be directly used for typomorphological analysis. It was not until after the Opium Wars that precise cadastral maps and aerial photographs gradually appeared in some colonial cities.

Figure 4-10 Maps of Guangzhou during the Ming Dynasty, Qing Dynasty, and modern times, Representing Three Historical Periods.

（Source：Compiled by the author based on http://www.txlzp.com）

（2）Solution to Application Difficulties

Field research plays a crucial role in the localization of typomorphology. Typomorphology is a method of studying urban form and spatial organization that requires a deep understanding of the specific characteristics of the research subject. As a direct means of observation and data collection, field research provides rich data and in-depth insights for localized studies.

Firstly, field research helps researchers gain a profound understanding of the local historical, cultural, and social background. Each city possesses its unique historical evolution and cultural heritage, which influence its urban form and spatial layout. Through field research, researchers can immerse themselves in the local historical ambiance, grasp the lifestyles and social customs of the local people, and thus gain a better understanding of the city's morphological features.

Secondly, field research enables the collection of actual geographic and architectural data. Typomorphology demands detailed research on urban spatial organization and building types, and field research allows direct observation and measurement of building dimensions, layouts, and materials, providing accurate spatial data. Additionally, historical maps and architectural drawings can be collected during field research, serving as valuable reference materials for typomorphological studies[33].

Additionally, researchers may explore complementary data sources, such as historical texts, archaeological surveys, and cultural heritage records, to supplement the limited cartographic materials. Integrating these diverse sources of information will contribute to a more holistic understanding of Chinese urban morphology and typology, supporting

sustainable urban planning and heritage preservation efforts.

Although historical urban data in domestic areas may be relatively limited compared to European countries, the research methods of on-site investigation and conceptual analysis can to some extent compensate for the lack of research materials[10].

The process of localizing typomorphology for Chinese cities is an ongoing endeavor that requires continued research and collaboration. As the field evolves, the integration of advanced technologies and traditional knowledge will shape a dynamic and culturally responsive approach to understanding, analyzing, and planning for the unique urban landscapes of China. By considering the historical, cultural, and geographical contexts of Chinese cities, typomorphological research can contribute significantly to the preservation and sustainable development of China's rich urban heritage.

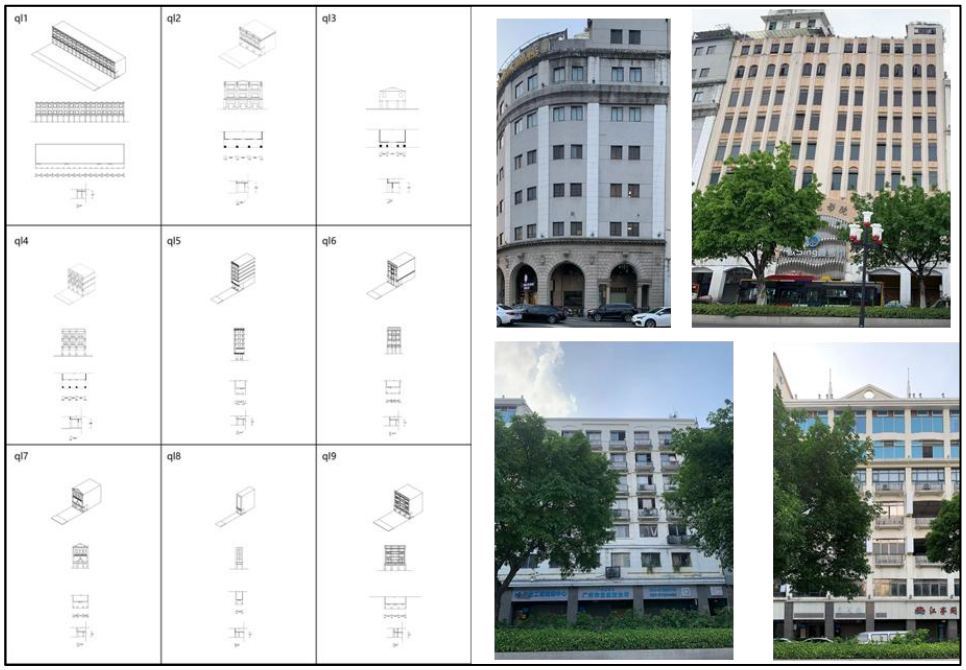


Figure 4-11 The Field Research Method Adopted in This Thesis

（Source：Illustrated by the author）

4.4.Construction of Localized Application Framework

4.4.1.Typomorphology Applied to the Linkages and Differences of Research Subjects

Peng Chang-Xin's two papers ""Paved corridor" and the riding building: the official

prototype of Lingnan riding building from Zhang Zhi-Dong's Guangzhou long dike plan" and "the riding building system and the city riding building" and related scholars' research papers have made a more detailed combing and analysis of the origin and the development of regulations of the riding building as a type of commercial building with its narrow open characteristics differentiated from other types of buildings in Guangzhou at that time. The scholars' research papers have made a more detailed combing and analysis of the origin and regulatory development of the Riding Floor. As a type of commercial building, the Riding Floor has the characteristics that differentiate it from other types of buildings in Guangzhou at that time, with its narrow openings, large depths, one-storey buildings indented inward, and two-storey or more buildings riding on top of the one-storey buildings, which has deeply penetrated into the hearts of every citizen of Guangzhou, and makes people feel that the Riding Floor is the best way of life. Once mentioning the riding building, this kind of architectural image appears in the mind, at this point in the definition of both in line with Carnegie for a type of a priori characteristics in the minds of people, but also in line with the later people through the rational means of the riding building and other architectural types of the a posteriori characteristics of the distinction between the riding building and other types of buildings.

The prototype of the Guangzhou Riding Mansion is also well recognized in the academic world. The completeness of the historical data makes it possible to know the size and functional arrangement of the original Riding Mansion space through Zhang Zhidong's initial plan of the Long Causeway Paved Corridor, and a clear point in time provides a convenient way to compare the Riding Mansion buildings constructed afterward with the original prototype of the Riding Mansion.

At the same time, the development of the riding building has its own vitality. From the analysis in the previous section, we can know that the development of the riding building is divided into several phases, and the form of the riding building in each phase has different characteristics that can be differentiated from that of the previous phase, and the motivation behind the development of the riding building is also closely related to the society and the economy, despite the differences in the social environment. Although the social environment is different, the western morphological typology study is focused on the physical form of the

buildings, and through the changes of the physical form of the buildings, the development law behind the buildings is studied, so it is feasible to summarize the motivation behind the development and the morphological law based on the morphological changes of the riding buildings.

Therefore, for this special type of commercial building in Guangzhou, the clearness of the building type, the reference of its prototype, and the detailedness of its own development data are all in line with the requirements of morphological typology for the analyzed object.

However, it should still be noted that the typological analysis in morphological typology often focuses on the plan and group organization of buildings, but less on the analysis of the typological patterns of building elevations and sections, which may be due to the fact that building elevations are easily affected by the architectural styles of the time, and due to the emergence of the "Classical Revival" façade in the West, which is the most common type of building in the world. One of the reasons may be that the façade of the building is easily influenced by the architectural style at that time, and due to the emergence of the Western "classical revival" façade, the façade of the building may not be strongly connected with the plan and section of the building, and it is more out of the owner's will and preference, so it is difficult to summarize the rules. While the riding building is different, due to its early design of short openings and large depths, as well as the nature of the commercial building itself decided to make the street front of the riding building become the focus of the design of the architectural form, and the form of the elevation of the riding building has also become an important factor in the composition of the urban environment at that time, so in the subsequent analysis should be in addition to the plane should also be mapped to study the elevation of the riding building.

Secondly, due to the fact that the analysis of building types in the Western morphology typology is aimed at the analysis of relatively stable historical cities, whose development history has been hundreds of years, while the zip code as a building type has been developed for just over one hundred years since it was formally used as a prototype of official buildings, and has experienced a period of stagnation and even decline, which makes the number of its buildings is often smaller than that of the residential buildings in the historical cities in the West, and the sample limitation makes it difficult for the analysis to be carried out. The

limitations of the sample make it difficult to obtain a comprehensive summary of the morphological patterns, or make the study one-sided, so it is necessary to control the scope of the study, select representative buildings and consider the scope of application of the formed urban guidelines. These are the things that need to be paid attention to in the subsequent application of the theory.

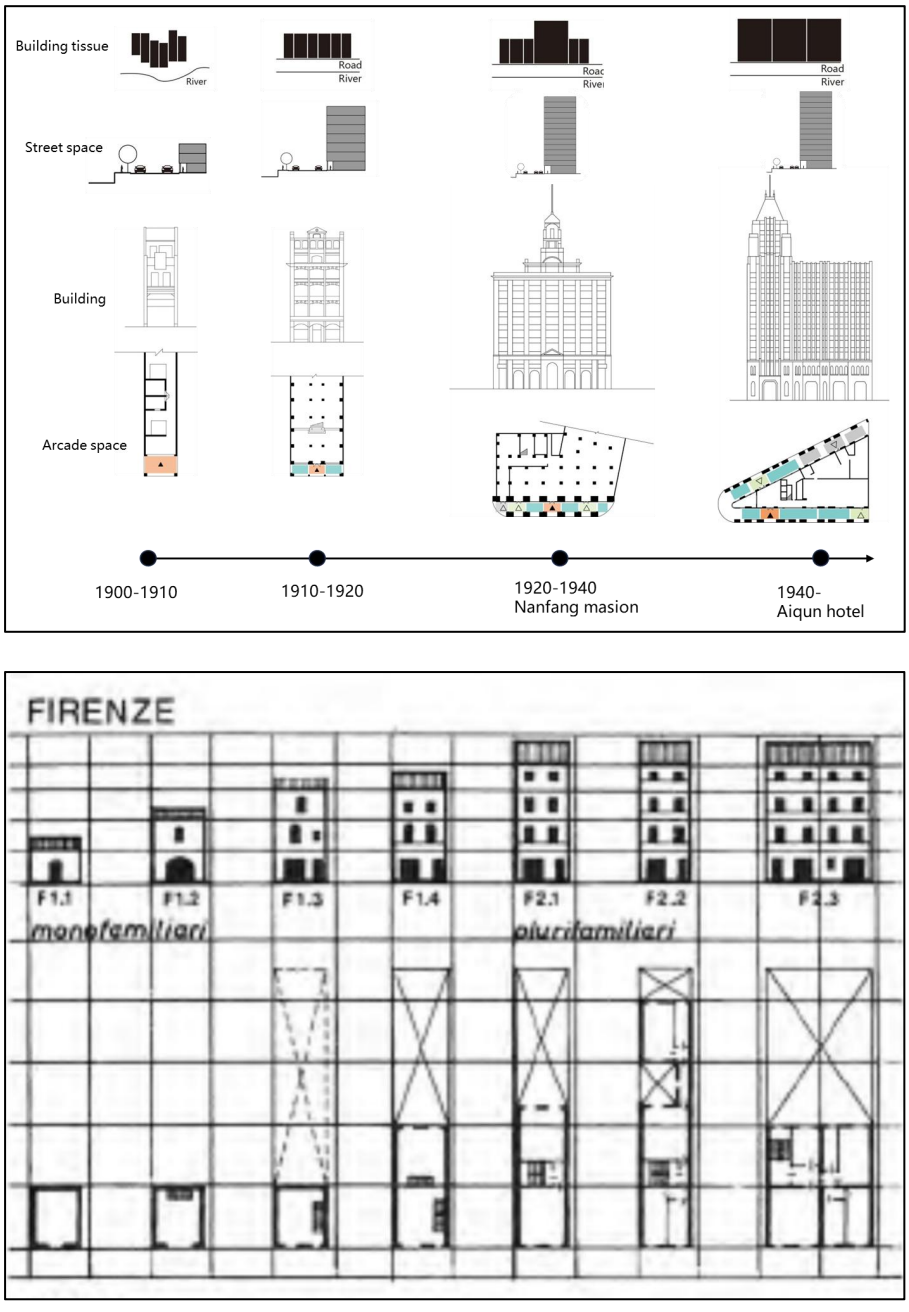


Figure 4-12 Comparison of Riding House and Florentine Residential Building Form Type Analysis

（Source：Illustrated by the author）

4.4.2.Construction of Localized Application Framework

After conducting preliminary theoretical and case studies, we can establish a set of typomorphology research framework suitable for the research object. The overall research framework consists of four parts: pre-research preparation, typomorphological analysis, urban design practice, and urban design guideline formulation.

（1）Pre-research preparation stage:

Following Kropf's typomorphology framework, the pre-research preparation stage involves setting research objectives and defining the research scope. The author has determined the scope of typomorphology analysis based on the research object and research goals. Through the collection of existing data, the expected research outcomes have been established.

（2）Typomorphology analysis stage:

As demonstrated in Chapter 3's case studies and Chenfei’s framework, the application of typomorphology includes analysis and practice. Different aspects of the study adopt Caniggia's process-type analysis method. It involves inferring the leading type of arcade buildings from historical data and studying their chronological variations. The goal is to understand the morphological characteristics of various types in different periods and classify the different variations through Kropf's morphological regions method.

（3）Urban form guideline formulation stage:

Referring to the application of planning management and morphological criteria in the case studies, guidelines are formulated for different scales, including building fabric, building form, and building space scales. These guidelines aim to preserve the characteristics of building types from these three aspects.

（4）Urban form design practice stage:

The accurate data obtained from the preliminary field survey results in the design object, forming the basis for the design. Using the morphological design guidelines derived from the characteristics of building types, the design process is guided. This helps establish a connection between new buildings and historical buildings at different scales.

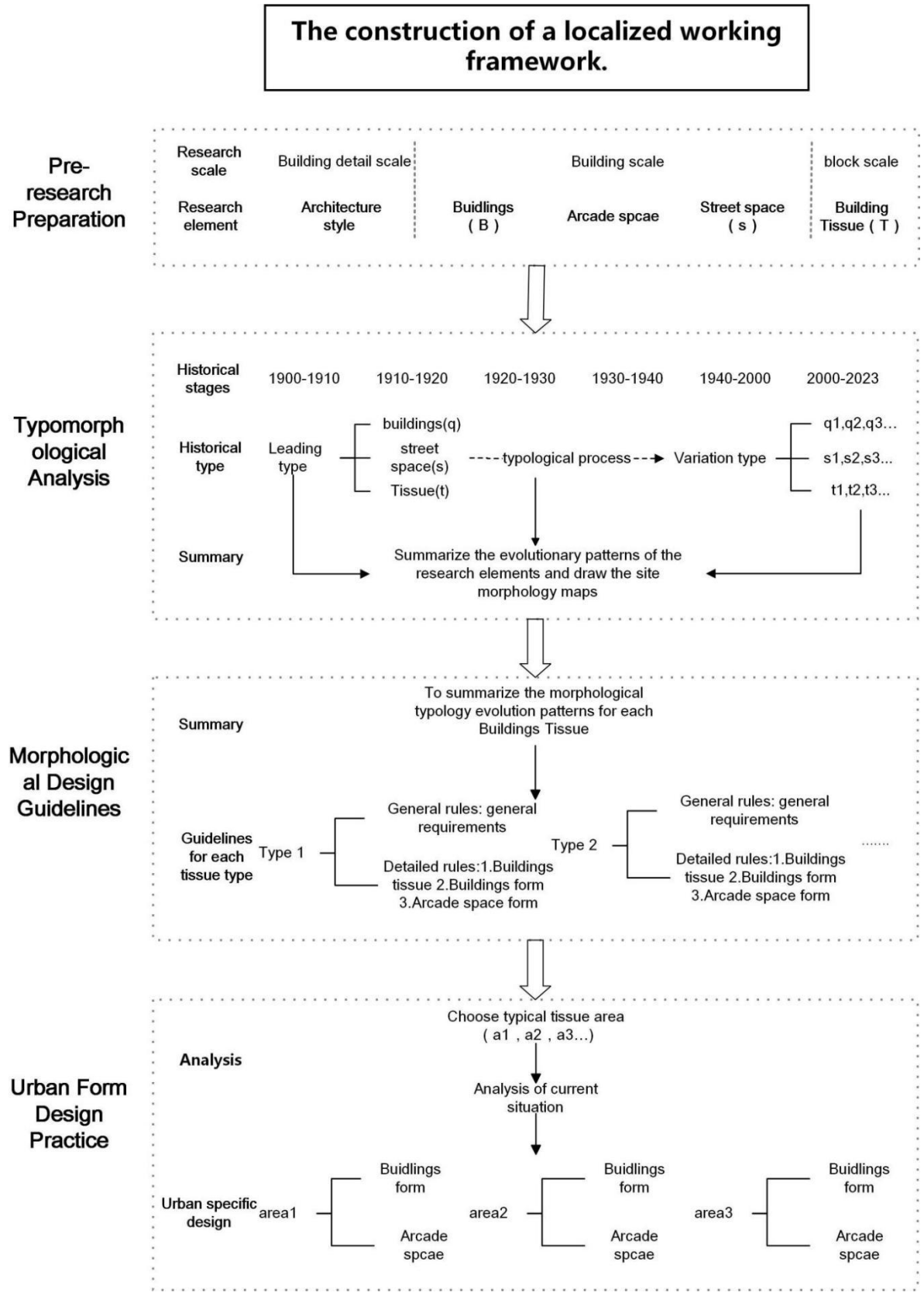


Figure 4-7 Construction of Localized Working Framework

（Source：Illustrated by the author）

4.5.Summary of This Chapter

In this chapter, through an analysis of the application background and conditions of typomorphology, we have gained insights into the potential limitations that typomorphology may encounter in future localized applications. We have also analyzed potential challenges that may arise during the research process and proposed methods to address these challenges effectively.

In the latter part of this chapter, we have drawn upon comprehensive references, such as Kropf's typomorphological framework and Chenfei's typomorphological framework. We have combined the research scope with the actual conditions of the study site and research objects, thus refining the scope of the study. Taking into account the application difficulties identified in the analysis of application conditions, we have taken a targeted approach to complement the research through on-site investigations and the collection of historical data. Additionally, we have conducted case studies to estimate the potential outcomes of the final application.

By synthesizing the results of previous analytical research, we have developed a localized application framework for typomorphology. This framework takes into account the specific context and conditions of the research site, providing a comprehensive approach for the application of typomorphology in a localized context.

Chapter 5 Typomorphological Analysis of the Site

In this chapter, the typomorphology localization framework will be utilized to analyze the site. The object of study will be divided into three dimensions: architectural tissue, architectural form, and the public space of the street. Furthermore, based on the historical data collected in the previous stage, the approximate stages of development for the object of study are determined, allowing for a diachronic analysis of the evolution of urban form by integrating different types of historical research data.

Following Caniggia's ideas, architectural form has been in a constant process of change and development, and the present architectural form inherently bears a connection with the past. Through the analysis of architectural forms in different historical stages, the morphological characteristics of the research object will be understood, and a summary of these characteristics will be provided at the end.

Finally, employing Conzen's method of morphological area division, different types of areas will be distinguished, forming a morphological zoning map that will guide the specific morphological design in the next stage.

5.1.Historical Overview of the Long Bund Arcade Street

Since 1888, the then administrator of Guangzhou, Zhang Zhidong, submitted plans for embankment construction on three separate occasions. Subsequently, modern industrial projects such as the Guangzhou-Hankou Railway, Wuxianmen Power Plant, and Shimin Brickyard were initiated in the vicinity of the Long Bund. After the establishment of the Republic of China in 1912, significant changes occurred in the architecture, urban fabric, and skyline of the Long Bund, making it the most prosperous area in Guangzhou at that time. However, with the fall of Guangzhou to Japanese forces in 1938, development in the Long Bund gradually stagnated. After the founding of the People's Republic of China, some urban development activities continued in the Long Bund, but it never regained its former prosperity[36].

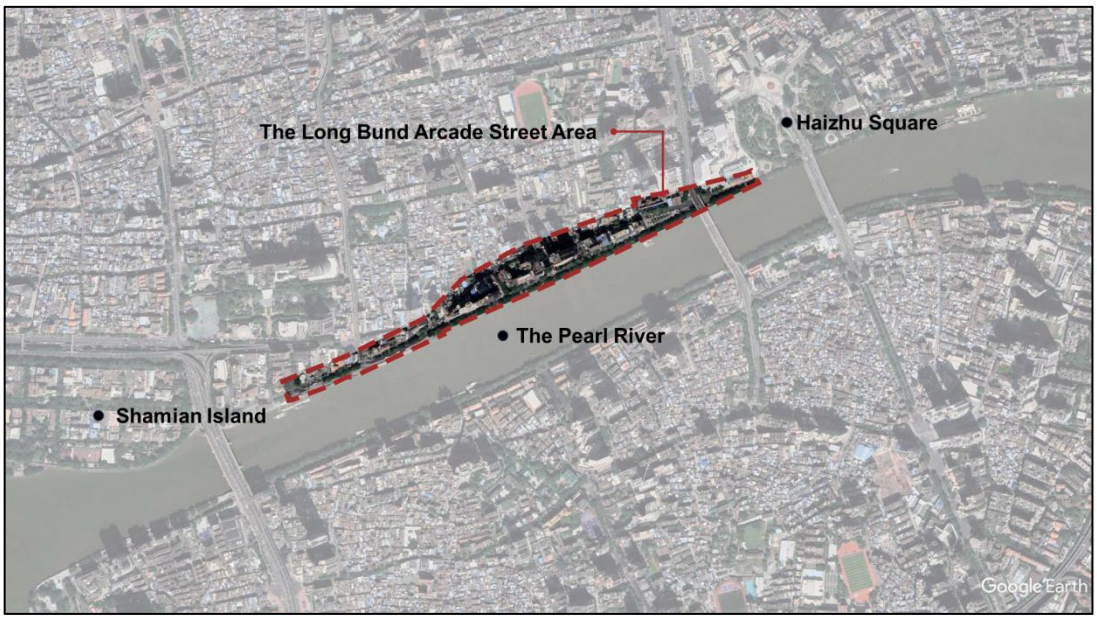


Figure 5-1 The Scope of the Long Bund Arcade Street

（Source：Illustrated by the author）

The research scope of this thesis includes the existing arcade buildings along the Long Bund, from Nanfang Masion on Yanjiang West Road to Wuxianmen Power Plant near Haizhu Bridge, covering the arcade buildings on the Long Bund and some buildings along Yanjiang West Road.

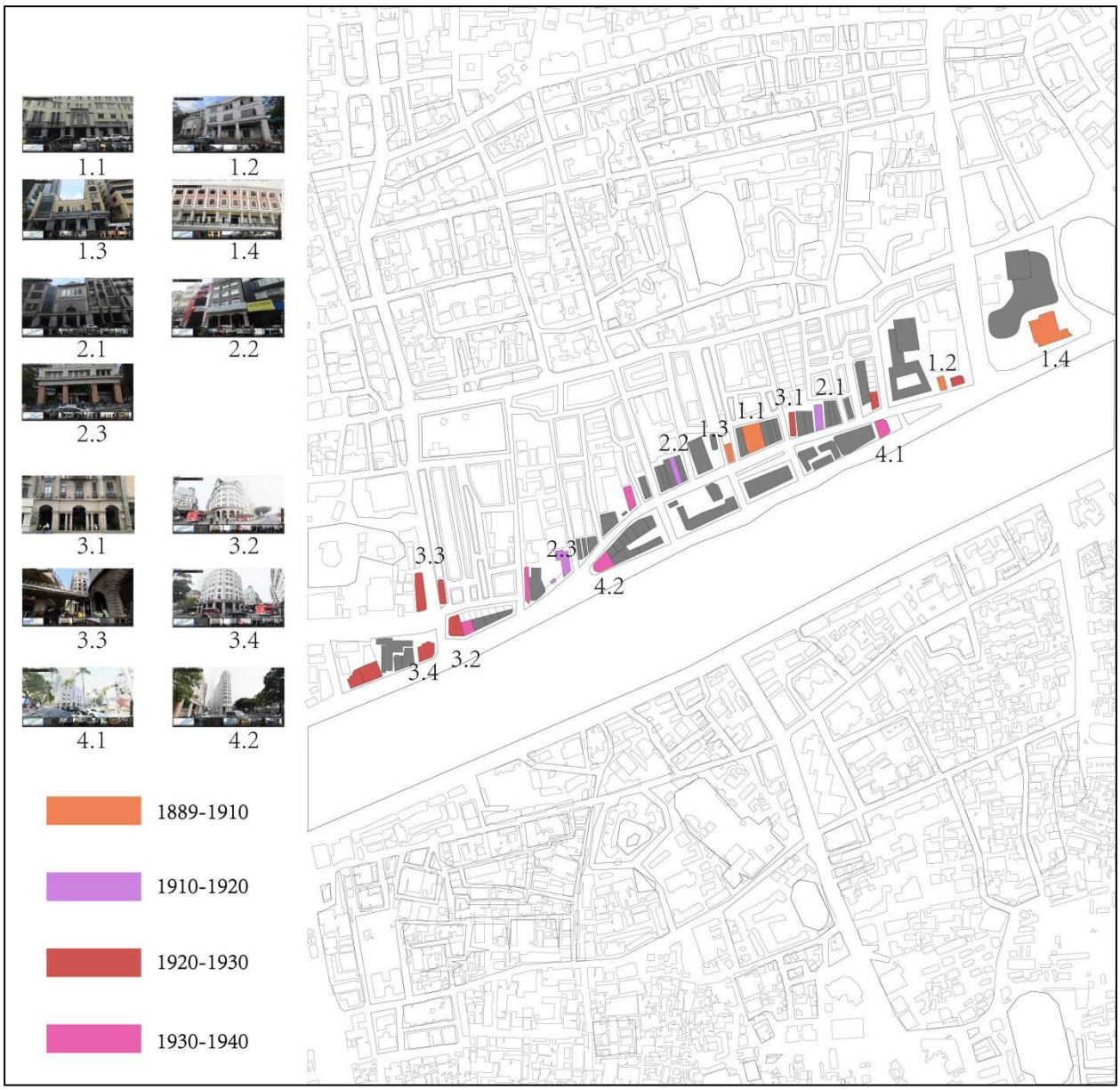


Figure 5-2 The Existing Arcade Buildings from Different Historical Stages in the Site.

（Source：Illustrated by the author）

The construction of the Long Bund's buildings is closely related to the development of Guangzhou's arcade buildings. the Long Bund has always been a focal point for the demonstration of the arcade system in Guangzhou. According to Peng Changxin, the arcade system, from its initial appearance as folk architecture to its formalization as a urban system, began in the late Qing Dynasty. However, it was only in the early Republic of China that it gradually became clearer and more standardized, and in the 1920s, it became an important means of modernization for Lingnan cities. During this period, arcade-like features emerged in Lingnan urban architecture, and the arcade system gradually evolved into a distinct

building type. The arcade has a dual nature, serving both as an urban system and a specific building type[37].

5.2.Historical Morphology of the Buildings Tissue

This section will analyze the buildings and their compositions on the master plan, as well as their relationship with the roads, and classify them based on different historical stages.

5.2.1.1900-1910 Early Bamboo the House Tissue

From the cadastral maps of the 1900s, we can observe that the inner city was predominantly characterized by elongated bamboo house structures[18]. The bamboo houses are unique to Guangzhou and were developed to accommodate the high-density urban commercial activities. They feature narrow and elongated structures in the urban fabric. Additionally, due to the absence of formal roads along the embankments in the past, there were limited restrictions on the architecture along the embankments, resulting in an organic arrangement of buildings in this area.

Figure 5-3 The Traditional Bamboo house Tissue in the Site.

(Source：Compiled by the author based on Wu Jianchi.“A Study on the Space History of the Long Bund in Canton(1888-1938)”)

5.2.2.1910-1920 The Arcade Tissue

In 1910, with the official completion of the construction of the Long Bund, the original irregular bamboo house structures were directly interrupted due to the embankment's

renovation and the road's construction. The building structures obtained neat boundaries. With the completion of the Long Bund, the area became the most prosperous commercial district in Guangzhou. Although the buildings were constructed in the form of arcade-style structures , they still retained the characteristics of the traditional bamboo house structures. This can be clearly seen from the road map and cadastral map of the uprising road connected to the Long Bund in 1918, which shows the transformation of the Long Bund after the demolition and road construction[39].

Figure 5-4 Arcade tissue after Road Construction

（Source：Compiled by the author based on Li Jun.“Studies of Spatial History in Central Axis of Modern Canton”）

5.2.3.1920-1930 Merging and Expanding the Arcade Tissue

After the road was constructed, the authorities continued to improve the space along the Longti embankment. During this period, Longti expanded its land area through land reclamation. The commercial development, along with the introduction of new types of buildings such as department stores and theaters, led to the enlargement of the land parcels beyond the typical narrow strip-like bamboo (zhutongwu) pattern.

However, the building grouping still retained the characteristic of arcade-style buildings closely arranged along the roads, resembling the traditional bamboo structures. This can be observed from the cadastral map of the Chengwaidaxin Company, where the large scale of Chengwaidaxin Company contrasts with the adjacent bamboo-style layout.

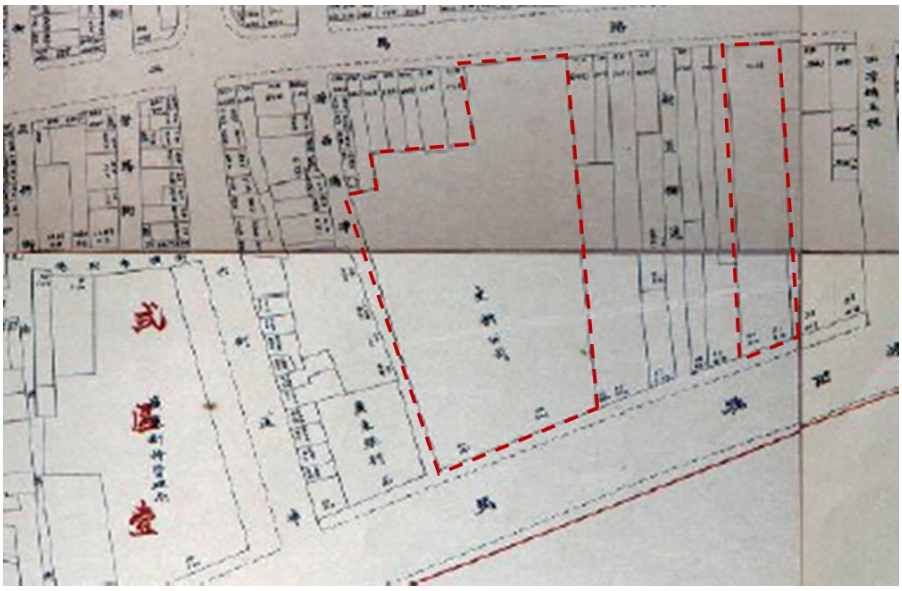


Figure 5-5 Chengwaidaxin Company Compared to the Surrounding Buildings.（Source：Compiled by the author based on Wu Jianchi.“A Study on the Space History of the Long Bund in Canton(1888-1938)”）

5.2.4.1930-1940 Independent the Arcade Tissue

In 1930, Haizhu Stone was filled, and Haizhu New Embankment was constructed, expanding the land of the Long Bund. The original arcade buildings on the Long Bund lost their advantage of facing the river and became part of the inner city. Iconic buildings were placed at the corners of the new land[40].

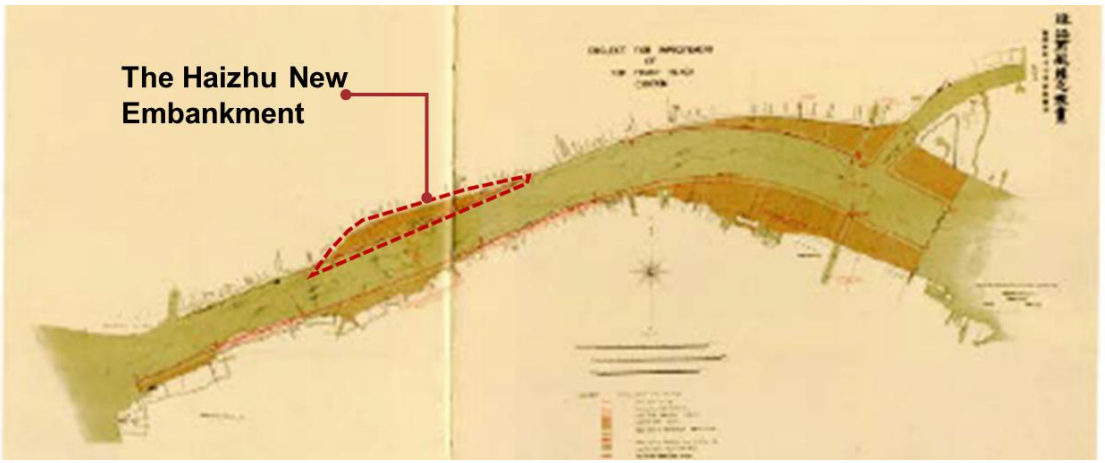


Figure 5-6 The Locationn of Haizhu New Embankment

(Source：Compiled by the author based on Wu Jianchi.“A Study on the Space History of the Long Bund in Canton(1888-1938)”）

However, due to the outbreak of the World War, the construction during this period was temporarily suspended. Only the eastern and western ends of the newly filled land were

developed, giving the new buildings a certain level of independence.

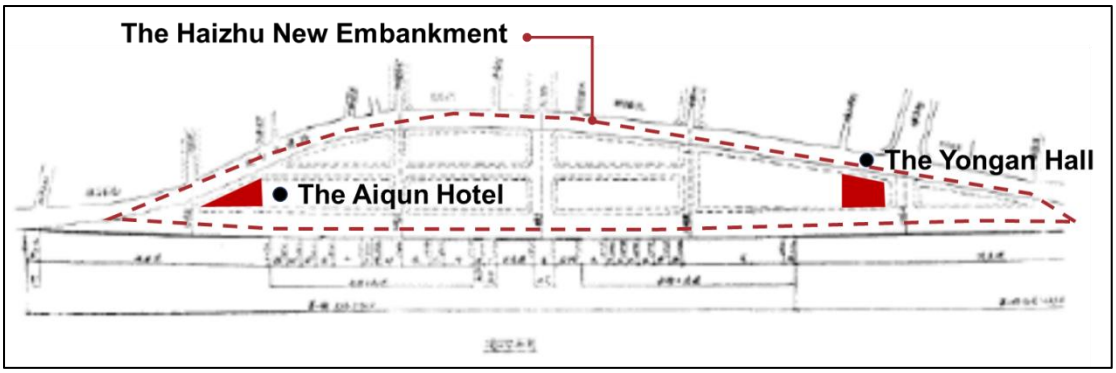


Figure 5-7 The Location of Two Buildings on Haizhu New Embankment.

(Source：Compiled by the author based on Wu Jianchi.“A Study on the Space History of the Long Bund in Canton(1888-1938)”)

5.2.5.1940-2000 The Modern Buildings Tissue of the Setback

During this period, with the abolishment of the regulations regarding arcade, the building tissue of the the Long Bund area exhibited different features. One was the continuation and development of the arcade spatial tissue inherited from Haizhu New Embankment, evident from the land use map of the New Aiqun Hotel project. The other featured a setback of buildings from the road boundary, forming a recessed tissue. Additionally, due to fire safety considerations, buildings were placed at a certain distance from each other. The traditional urban tissue of bamboo houses gradually broke, but traces of historical tissue could still be observed[41].

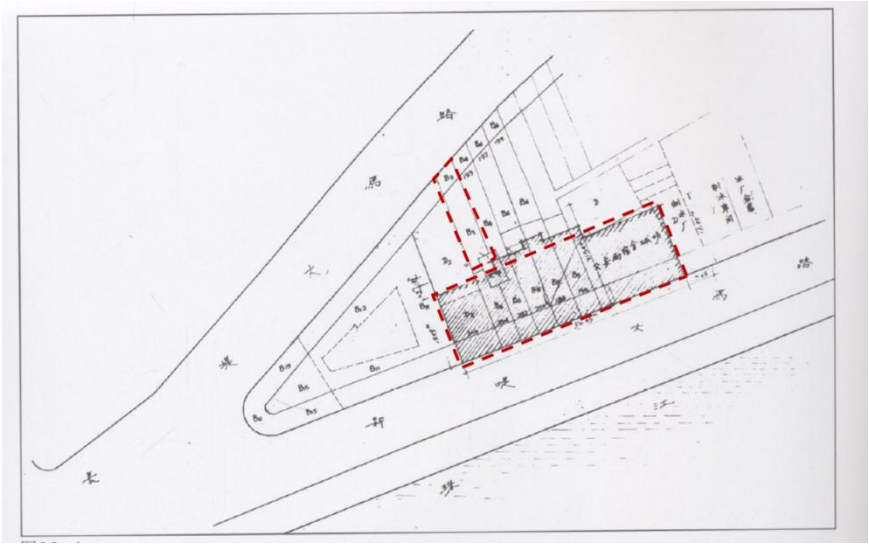


Figure 5-8 The Construction Area of the New Aiqun Hotel and the Arcade Urban Fabric in its Surroundings.

(Source：Compiled by the author based on Shi Anhai.“Lingnan Excellent Modern and Contemporary Architecture.”)

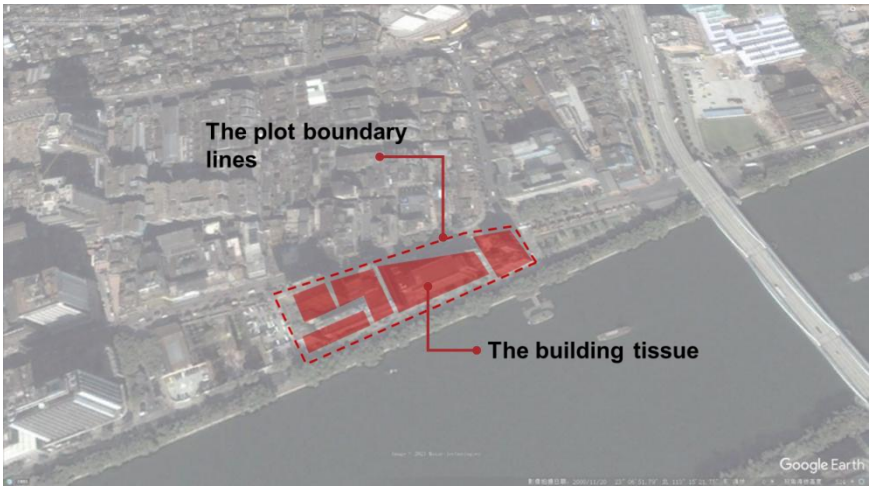


Figure 5-9 Inference of Urban Tissue on the East Side of Haizhu New Embankment.

（Source：Reproduced from Google Earth Satellite image of the year 2000）

5.2.6.2000-2023 The Completely Independent Modern Buildings Tissue

In addition to the continuation of the above-mentioned building patterns, the modern arcade street on the Long Bund also exhibits a new pattern due to the merging of land parcels. In the central area, which is less influenced by the arcade buildings on both ends of the Hai Zhu New Embankment, there are completely independent building blocks separated by urban branch roads. Moreover, the buildings within these blocks are set back at a certain distance

from the road, making their building pattern completely independent of the surrounding urban fabric.

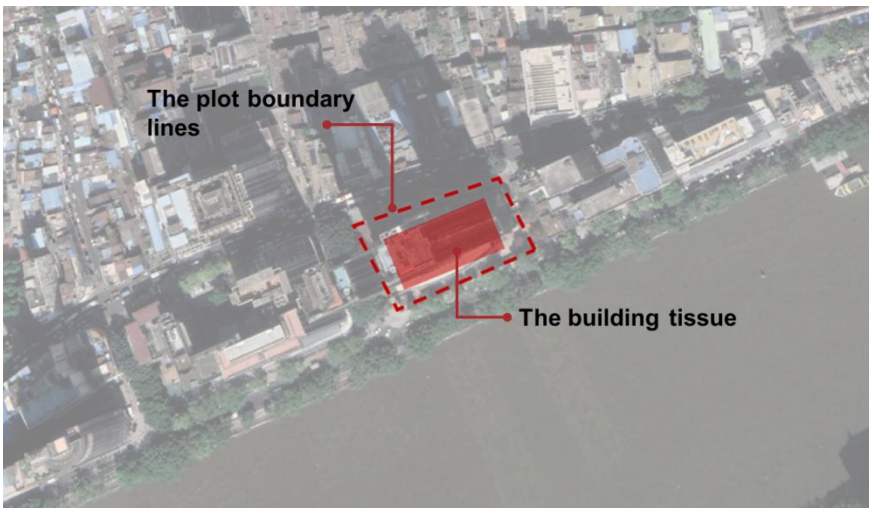


Figure 5-10 Inference of the Building Tissue in the Middle Section of the Haizhu New Embankment.

（Source：Reproduced from Google Earth Satellite image of the year 2023）

5.2.7.Historical Morphology of the Buildings Tissue Timeline

Sorting out the temporal development of the historical form of the site's urban texture, the development of the riding building can be categorized from three perspectives.

The first one is the angle of relationship with the city, as can be seen from the early riding buildings (1900-1910), the early riding buildings have not yet formed a neat and straight road due to the front facing space, which makes the riding building texture show a more organic character, while from 1910-1940, due to the construction of the road and the implementation of the regulations of the riding buildings, the riding buildings tend to be constructed close to the edge of the road, so that the overall riding building The overall texture of the buildings is characterized by the neatness of the lines, while from 1940 to the present, due to the implementation of the new urban regulations, the buildings tend to be constructed independently, and the relationship between the buildings and the roads becomes more separated, with the buildings and the roads forming a kind of receding relationship.

The second urban texture characteristic is based on the scale of individual buildings, because the early zip code is characterized by short openings and long depths, so its urban texture level shows a long and narrow shape, and due to the later commercial development

and the zip code in the direction of the zip code opening less restrictive, slowly the zip code began to get rid of the traditional bamboo house texture of the long and narrow characteristics, began to develop in the direction of the large volume and began to pursue longer and more conspicuous, and the zip code began to be more and more attractive. It began to pursue a longer and more eye-catching setting along the street. In modern times, due to the further intensification of urban land use, the buildings began to develop in the direction of high-rise, showing a relatively large scale and a large distance from the neighboring buildings in the texture.

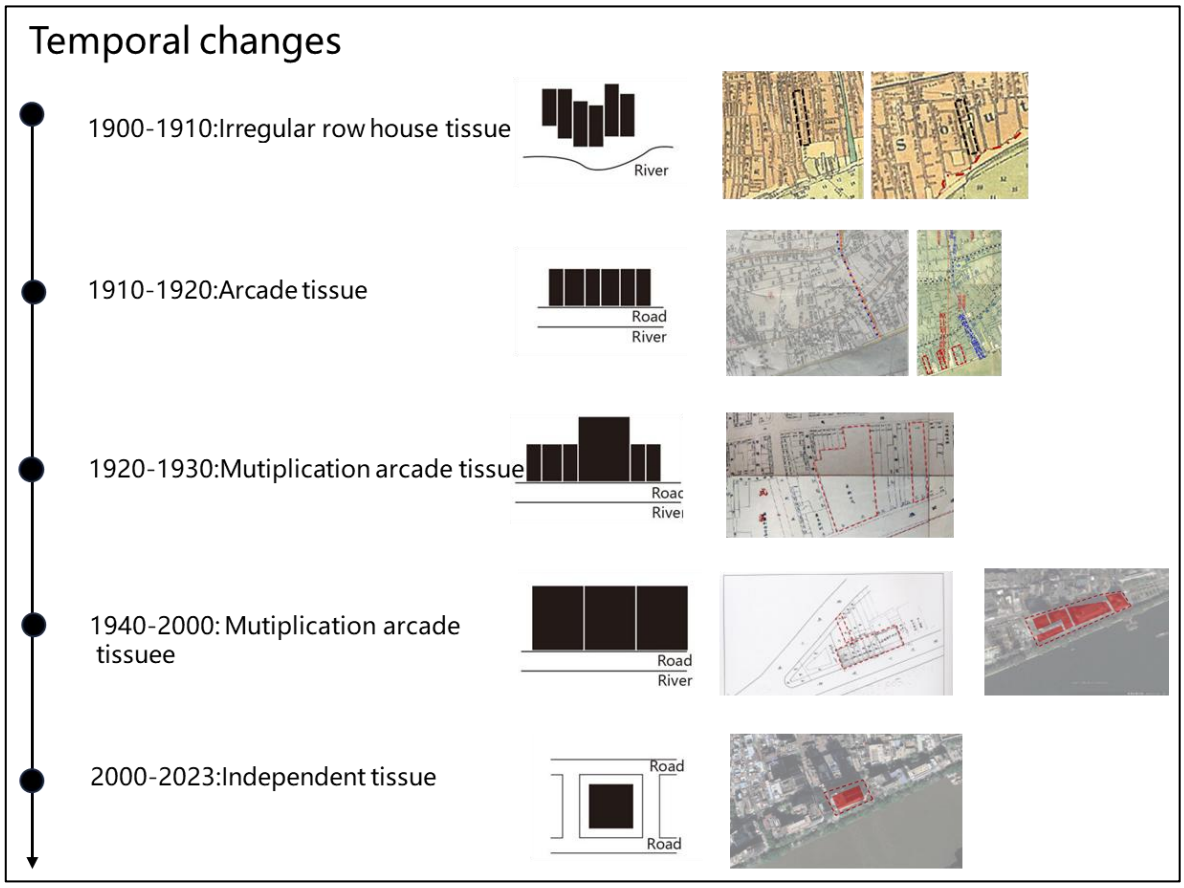


Figure 5-10 Historical Morphology of the Buildings Tissue Timeline

（Source：Illustrated by the author）

The third urban texture characteristics of the classification is based on the relationship with the surrounding buildings, from the early class of bamboo house texture can be seen in the form of the building and the adjacent buildings side by side but in the space is not connected, and with the formulation and development of the Riding House regulations, the Riding House buildings are often embodied in the texture of the form of the buildings and the

spatial connection, and to the modern era, the buildings in order to pursue better ventilation and lighting environment, often take the way back from each other. In the modern period, the buildings are often set back from each other in order to pursue a better ventilation and lighting environment.

5.3.The Historical morphology of Buildings

The arcade architecture in the Long Bund has always been known for its diverse morphology. There are many classic arcade buildings in the Long Bund that represent the development history of arcade architecture in Guangzhou. They have served as exemplary models for the architecture of that time, leading the building trend. This section will analyze the morphological changes of these representative arcade buildings.

5.3.1.1900-1910 Prototype of the Arcade Building

The existing arcade buildings in the site from the 1900s include the China-France Daomei Hospital, which was built in 1903. Based on historical photographs, it is evident that this building is a Chinese-style sloping-roofed arcade. According to the existing building's survey data, the ground floor space of the arcade is relatively narrow. The total depth of the arcade is about 2.4m, but due to construction techniques at that time, the thickness of the columns in the depth direction is 0.6m, and the corner columns reach up to 1.2m, resulting in a net depth of only 1.2m for pedestrians to walk on the arcade street, making it inconvenient for pedestrian passage. Furthermore, there are no connected arcade buildings in the vicinity[44].

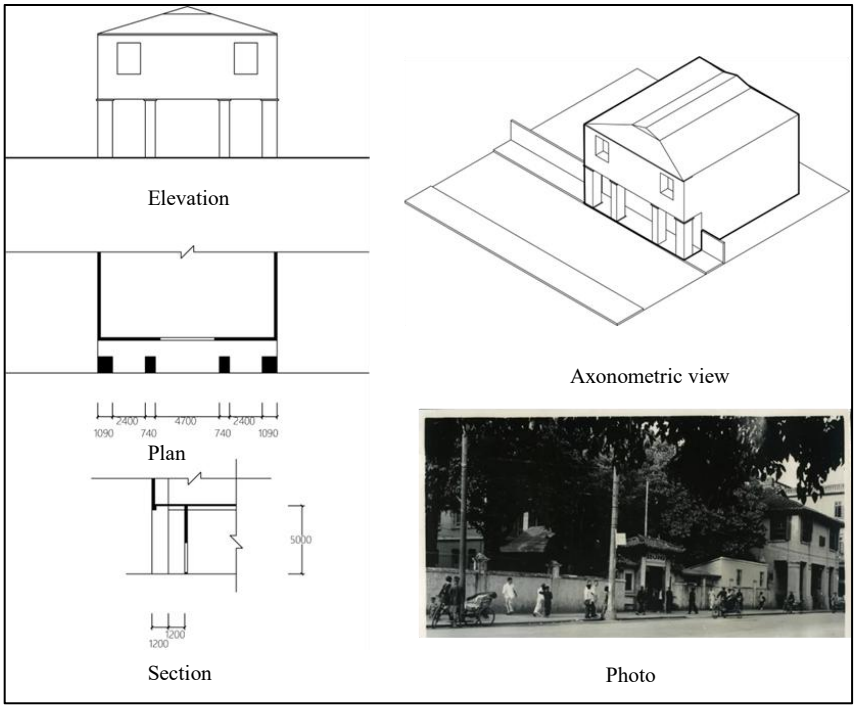


Figure 5-11 The Information of the China-France Daomei Hospital.

（Source：Measured and illustrated by the author）

The form of arcade adopted by the China-French Daomei Hospital may have originated from Zhang Zhidong's embankment concept during his administration of Guangzhou in 1888. Zhang Zhidong's initial purpose in constructing the Pearl River embankment was to revitalize commerce. On July 3rd, 1889, he proposed, "Outside the scope of the road, build arcades for the convenience of citizens to conduct trade, and within the arcades, construct commercial buildings to form neat rows."

Arcades were common commercial spaces in Guangzhou at that time, with recessed porches along the roadsides. However, the porches were enclosed by brick walls on both sides, and did not form continuous covered pedestrian spaces like a traditional arcade street. Although there were some external arcade-style buildings, they generally did not create a continuous pedestrian spaces[41].

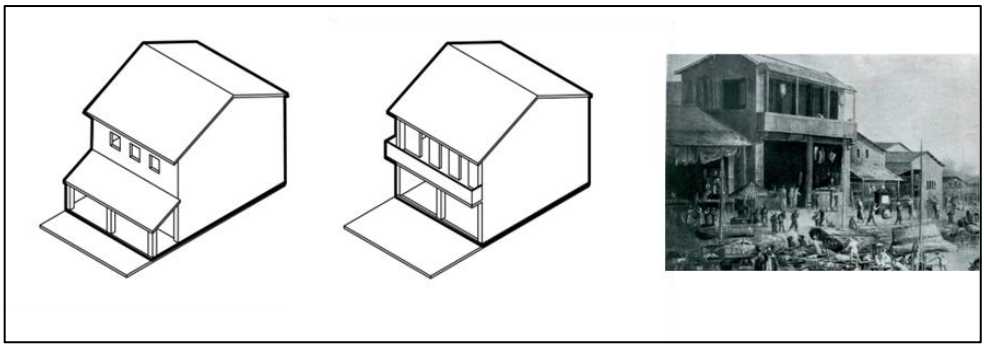


Figure 5-12 The Information of the “Puwu” Building

（Source：Compiled by the author based on the historical drawing）

From his proposal, it can be inferred that Zhang Zhidong's initial concept for the architecture of the Long Bund was to add an "arcade" space in front of the traditional “Puwu” commercial buildings, creating a neat urban interface and providing a public space for trading. However, unfortunately, Zhang Zhidong's plan for the architecture of the Long Bund was halted after a period of construction, resulting in limited changes to the overall building image of the Long Bund.

Based on historical images of the Long Bund, it can be deduced that the overall building form of the Long Bund was still in a relatively mixed state at that time[42].

Figure 5-13 Buildings along the Pearl River in the 1900s.

（Source：Compiled by the author based on

https://commons.wikimedia.org/wiki/Category:Historical_images_of_Guangzhou）

5.3.2.1910-1920 First Birth of the Arcade Building

With the construction of the Long Bund and the promulgation of the first building regulations related to arcade buildings, the building development of the Long Bund entered a new historical period. The East Asia Hotel, constructed by the Sincere Company, became the iconic building leading the building context of the Long Bund during this period.

Completed in 1914, the East Asia Hotel was an affiliated hotel of the Sincere Department

Store. It faced north and occupied an area of 1,032 square meters, with a building area of approximately 8,000 square meters. It was a seven-story building constructed with reinforced concrete.

The East Asia Hotel was one of the early commercial buildings in Guangzhou that adopted arcade architecture during the early Republican period. Its south facade exhibited a Western eclectic style, with three spans and a width of 12 meters, arranged in a three-tiered composition. The ground floor featured arcades with high ceilings, flanked by square columns and two Tuscan round columns in the middle, adorned with stone carvings on top. As the floors ascend, the heights gradually decrease. The second to fourth floors have arched windows, and the fourth floor has projecting eaves. The fifth floor has a central arched window and rectangular windows on both sides, while the sixth floor has two small arched windows in each bay, creating a dynamic and rhythmic effect for the entire south facade.

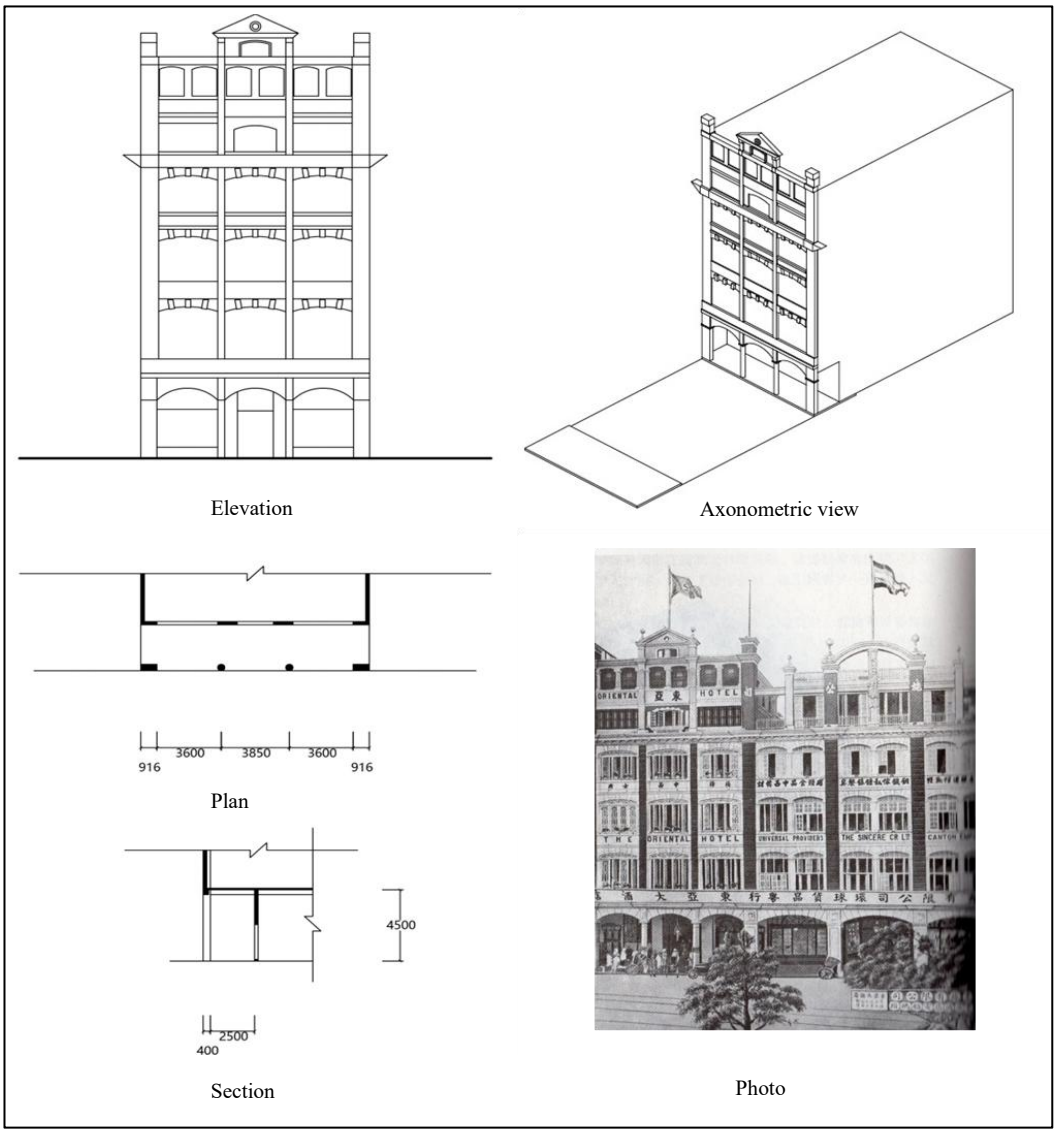


Figure 5-14 The Information of the East Asia Hotel.

（Source：Measured and illustrated by the author）

5.3.3.1920-1930 Development of the Arcade Building

In 1930, the reclamation of Haizhu Stone was completed, and a new embankment was constructed. As a result, the East Asia Hotel lost its advantageous position along the Pearl River. Moreover, with advancing architectural technology, the original size of the East Asia Hotel was gradually surpassed. At the western end of the Long Bund, the Overseas Chinese Corporation replaced the East Asia Hotel and became the new representative building[43].

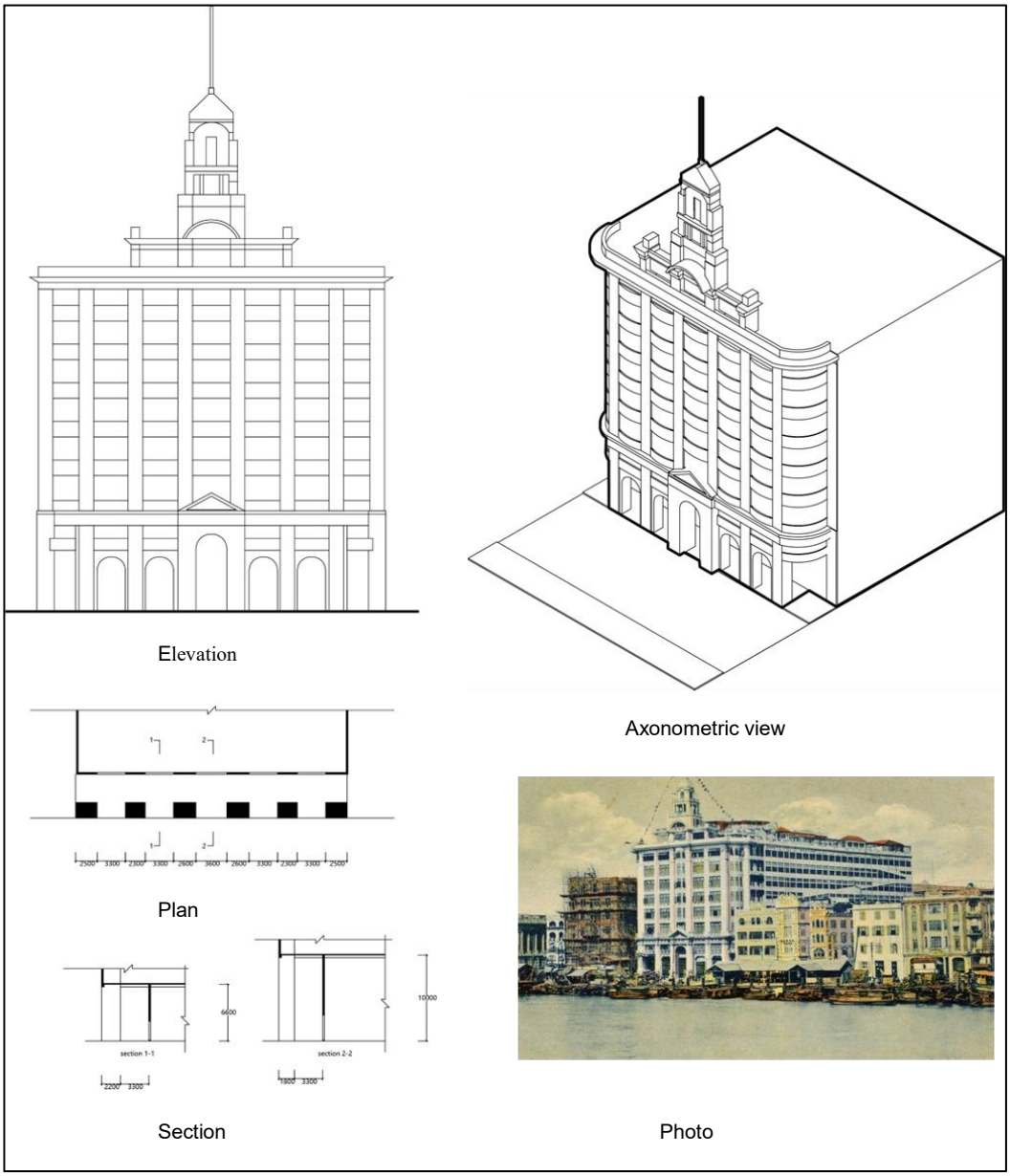


Figure 5-15 The Information of the Chengwaidaxin Company.

（Source：Measured and illustrated by the author）

Completed in 1922 and designed by Lin Keming, the Chengwaidaxin Company faces south towards the Pearl River. Its south facade spans 38 meters and the building is 50 meters high with a total of twelve floors. It was China's first high-rise building with a reinforced concrete frame structure. The south facade of the Chengwaidaxin Company features a typical Western eclectic style during the Republican era, with a vertical three-tiered composition. The exterior walls are finished with water-brushed stone and have horizontal lines at the corners, giving the building an elegant and majestic appearance. The north and south facades are both designed with arcade structures extending over the sidewalks. The southern facade arcade is

grand, featuring a central arched portal as the main entrance, adorned with triangular pediments. Above the second floor, the main facade has pilasters with narrower central spans[44].

5.3.4.1930-1940 Maturity of the Arcade Building

With the construction of the Hai Zhu New Embankment, it also brought opportunities for the construction of new building types in the Long Bund. The construction of Aiqun Hotel began in 1934 and was completed in 1937. It was designed by the returning architect Chen Rongzhi. The building has a height of 64 meters and 15 floors, making it the tallest building in Guangzhou at that time, comparable in scale to the Chengwaidaxin Company. Throughout its history, Aiqun Hotel has been an iconic example of commercial architecture in Guangzhou. Influenced by the American high-rise architectural style of that period, the architect adopted an early modern style with Gothic revival features, incorporating many characteristics of Lingnan regional architecture[40].

The ground floor of the hotel is 6 meters high, with a rhythmic arrangement of columns and arcades in the arcade. From the second floor and above, the facade features continuous vertical lines with vertically aligned elongated windows, each with a trapezoidal-shaped top, emphasizing an upward motion. The windows are flanked by protruding pillars that extend from top to bottom, creating a strong play of light and shadow in the sunlight. The entire building's facade emphasizes vertical lines, exuding a strong sense of upward movement.

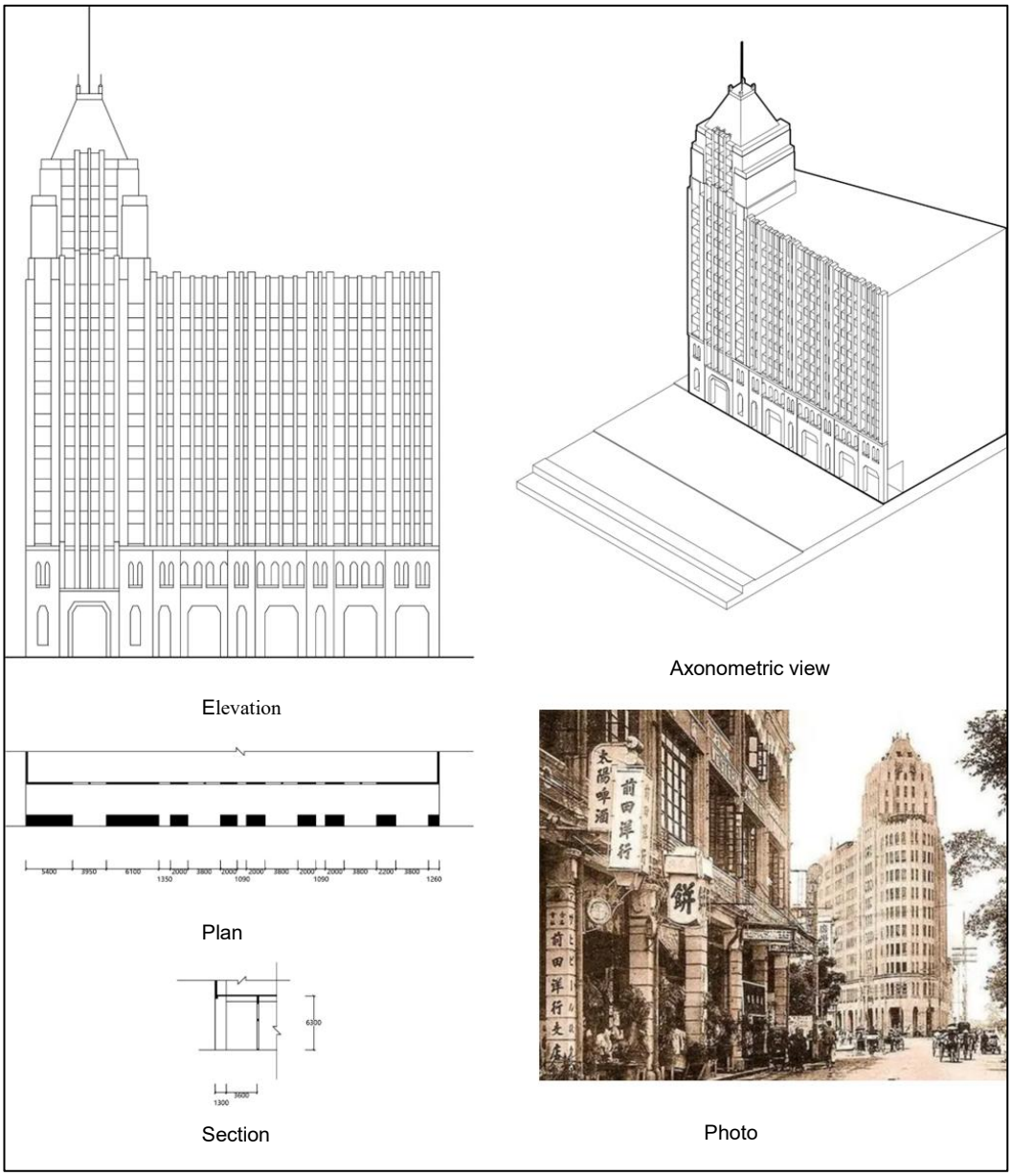


Figure 5-16 The information of the Aiqun Hotel.

（Source：Measured and illustrated by the author）

5.3.5.1940-2000 Decline of the Arcade Building

To address the accommodation needs of visiting guests and businessmen, the Guangzhou government expanded the east side of Aiqun Hotel in 1965, adding an 18-story new building known as the New Aiqun Hotel.

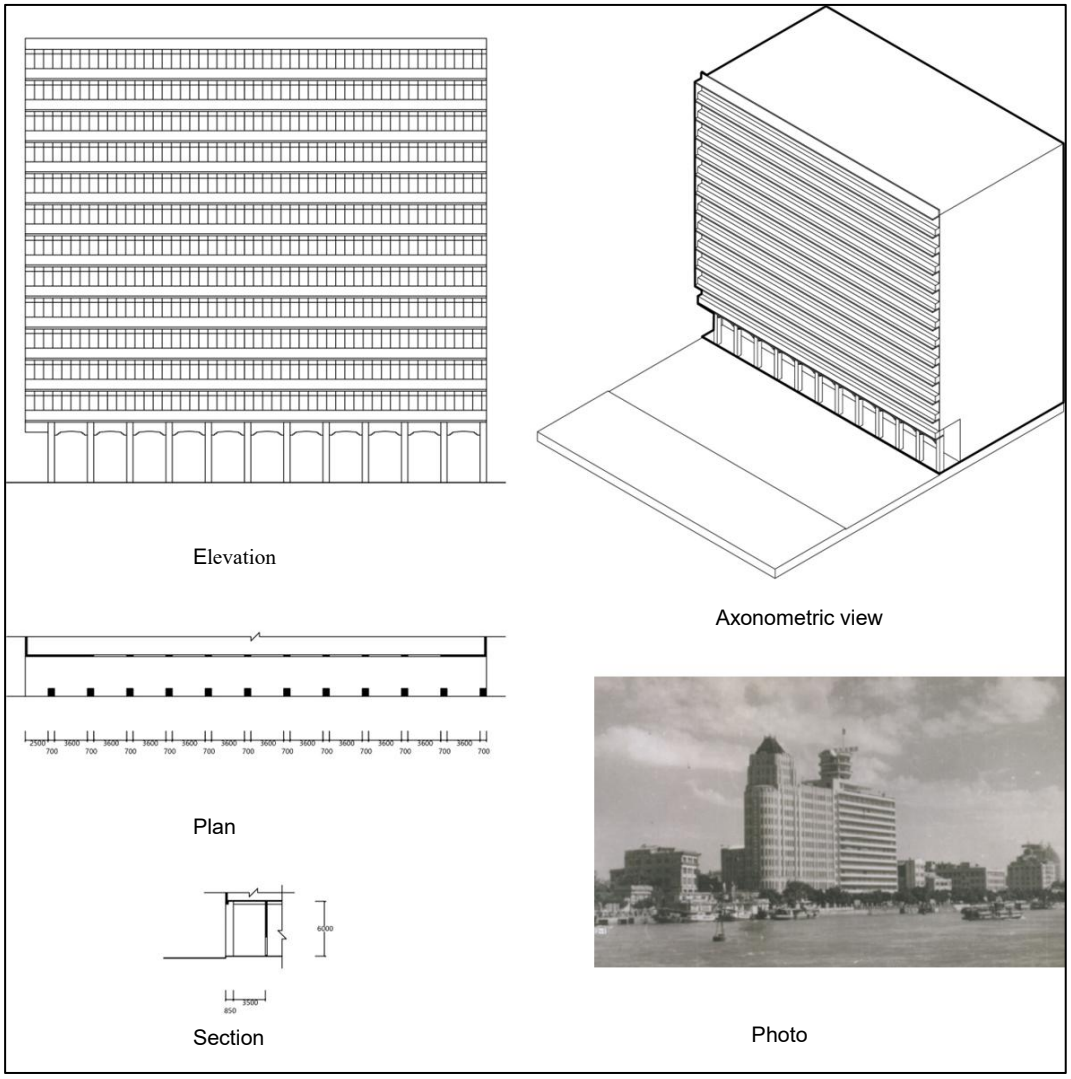


Figure 5-17 The Information of the New Aiqun Hotel.

（Source：Measured and illustrated by the author）

The design of the New Aiqun Hotel was overseen by architect Mo Beizhi. At that time, there was a suggestion to maintain the building style of Aiqun Hotel for the new building, with an emphasis on a continuous vertical rhythm in the facade. Mo Beizhi adopted a contrast between old and new, focusing on the use of horizontal lines in the design. His concept and implementation received support from Lin Xi, the Deputy Mayor of Guangzhou[45].

When completed in 1965, the New Aiqun Hotel had a main building with 14 floors and a 4-story tower, totaling 18 floors. The ground floor housed a central hall, elevators, a convenience store, and a garage, while the attic featured a barber shop and service rooms. Floors 2 to 12 were standard guest rooms. The building's exterior employed horizontal band windows to accentuate the sense of horizontality, forming a distinct contrast with the original

vertical image of Aiqun Hotel.

5.3.6.2000-2023 Redevelopment of the Arcade Building

China has entered a phase of rapid urbanization, and with the slowing down of the urbanization process and a renewed focus on traditional building morphology, urban renewal has become a major task in contemporary Chinese urban development. As a result, the building form of the arcade has experienced different developmental directions, thanks to architects' rediscovery.

The National Breathing Center, located on the east side of Hai Zhu New Embankment, is adjacent to the historic arcade building, Yongan Hall. The architects employed a response strategy by referencing the protruding colonnades of the arcade, creating a harmonious relationship with the neighboring Yongan Hall in terms of the height and division of the arcade space. Although the colonnade space has shifted from the interior of the building to the exterior, it has also gained a certain level of public accessibility, making it a place for people to rest along the sidewalk.

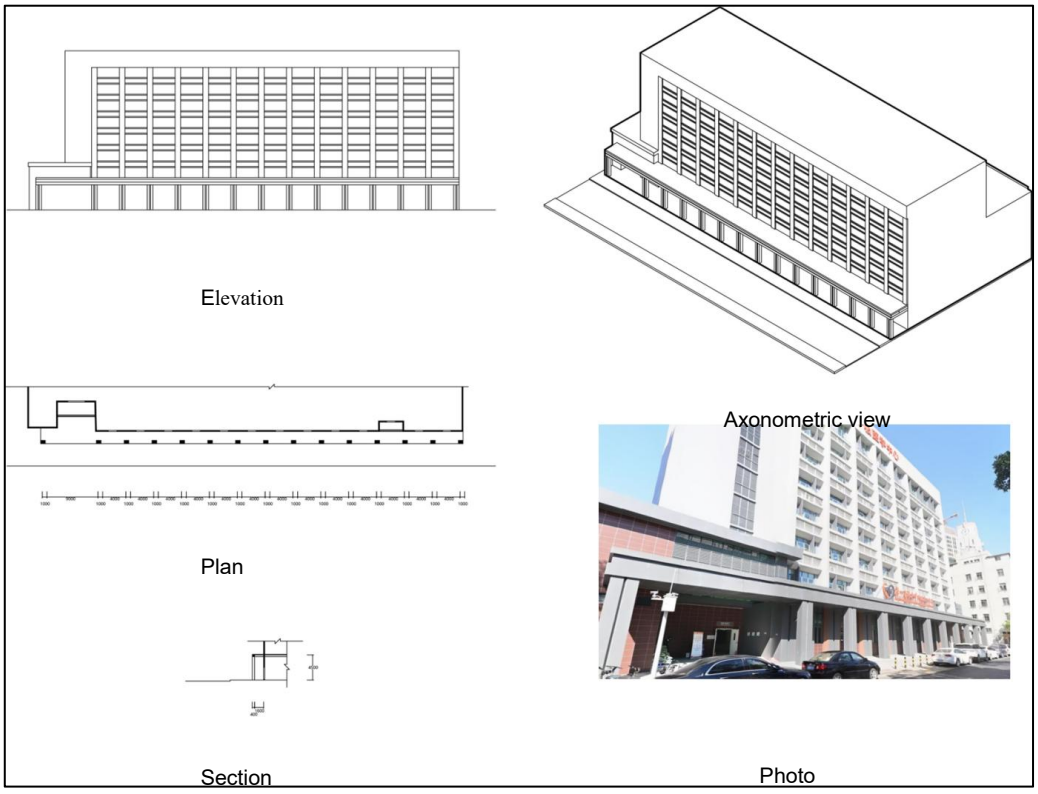


Figure 5-18 The Information of the National Breathing Center.

（Source：Measured and illustrated by the author）

5.3.7.The Historical morphology of Buildings Timeline

From the historical form of the riding building for the time development of the comb, can be categorized from two perspectives on the form of the riding building.

The first classification is based on the height of the number of floors of the building, from the two to three floors of the building in the early days, with the development of commerce gradually become seven to nine floors, and to the mature period of the development of the building, the height of the building came to more than ten floors, and with the increase in the number of floors of the riding floor, the height of the ground floor of the riding floor space is also increasing. At the same time, the ground floor of the building space as an architectural composition element also plays a different role.

The second classification is based on the number of openings in the ground floor space of the building, the building was originally changed from the bamboo house, reflecting the characteristics of the bamboo house with a single opening, but with the development of commerce, the building gradually evolved from a single opening to three openings and multiple openings, and the building's openings were also shaped by the original simple beams and columns into a variety of distinctive openings. And also changed the shape of the city streets, city streets from the original multi-storey side-by-side, into a large volume of storeys neat rhythmic openings image.

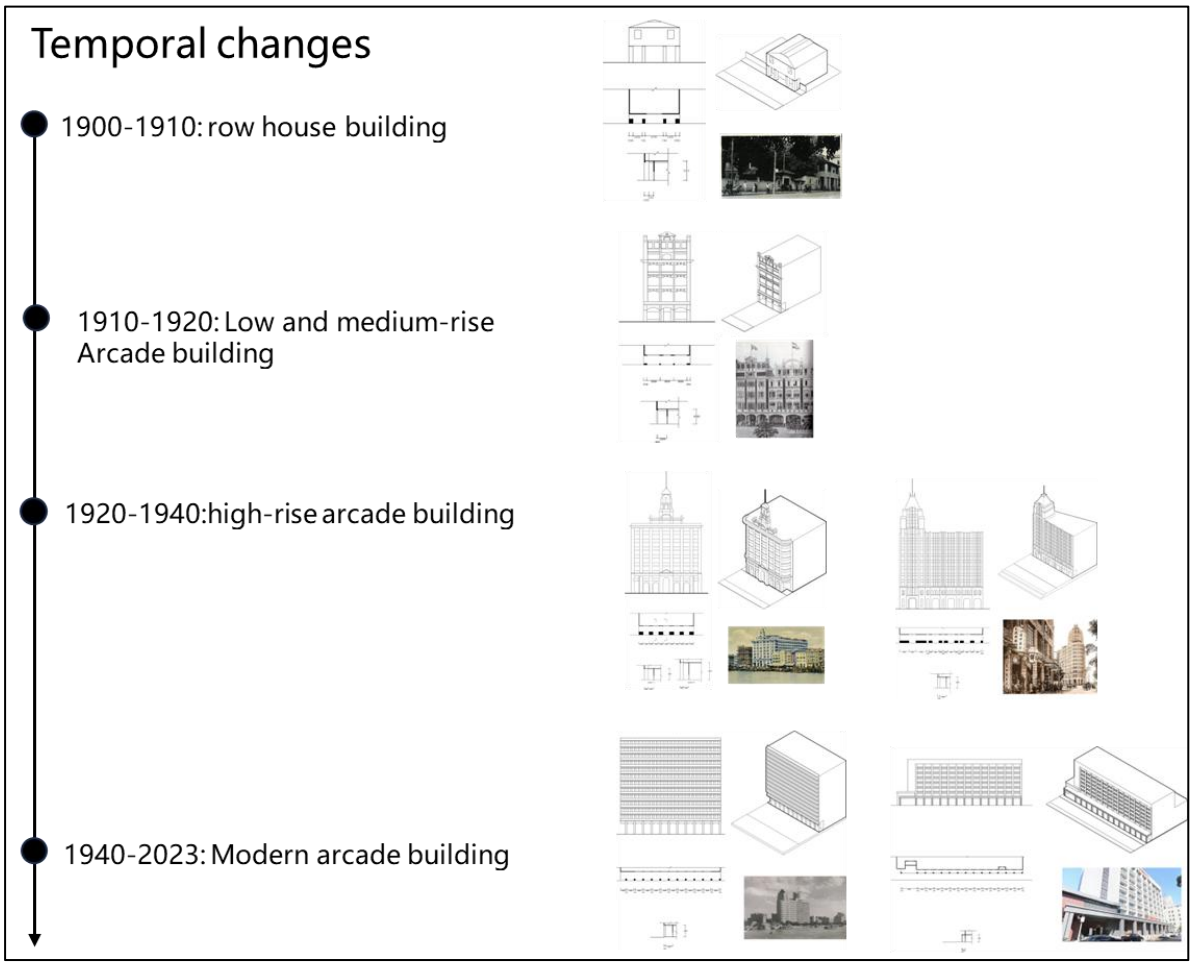


Figure 5-10 The Historical morphology of Buildings Timeline

（Source：Illustrated by the author）

5.4.Historical Morphology of the Street Cross-sections and the Arcade Spaces

Due to the dual nature of architecture and urbanism, the arcade space is an integral part of urban space. In this section, we will analyze the cross-section of arcade building and road space to research the morphological changes in urban public space.

5.4.1.1900-1910 The Street Cross-section of Zhang Zhidong's Project

Zhang Zhidong's proposal for the Street Cross-section holds profound significance. His street cross-section model clearly divided different spaces on the street at specific scales, each serving different functions such as "pedestrian," "vehicle traffic," "commerce," and

"business." This forward-thinking urban street concept laid the foundation for the later popularization of the arcade building system in Guangzhou, providing a model and reference.

In his vision for the space of the Long Bund, Zhang Zhidong not only functionally divided the Street Cross-section but also precisely specified its dimensions. He defined the dimensions of the corridor as one "Zhang" (approx. 3.2m) in height and five "Zhang" two "Chi" (approx. 16.64m) in width on the embankment, with a stone masonry thickness of three "Chi" (approx. 0.96m), and the embankment's parapet one "Zhang" three "Chi" (approx. 4.16m) in height. The road was three "Zhang" (approx. 9.6m) wide, and the corridor six "Chi" (approx. 1.92m) wide." This had a guiding effect on the construction of arcade buildings on the Long Bund during the late Qing Dynasty.

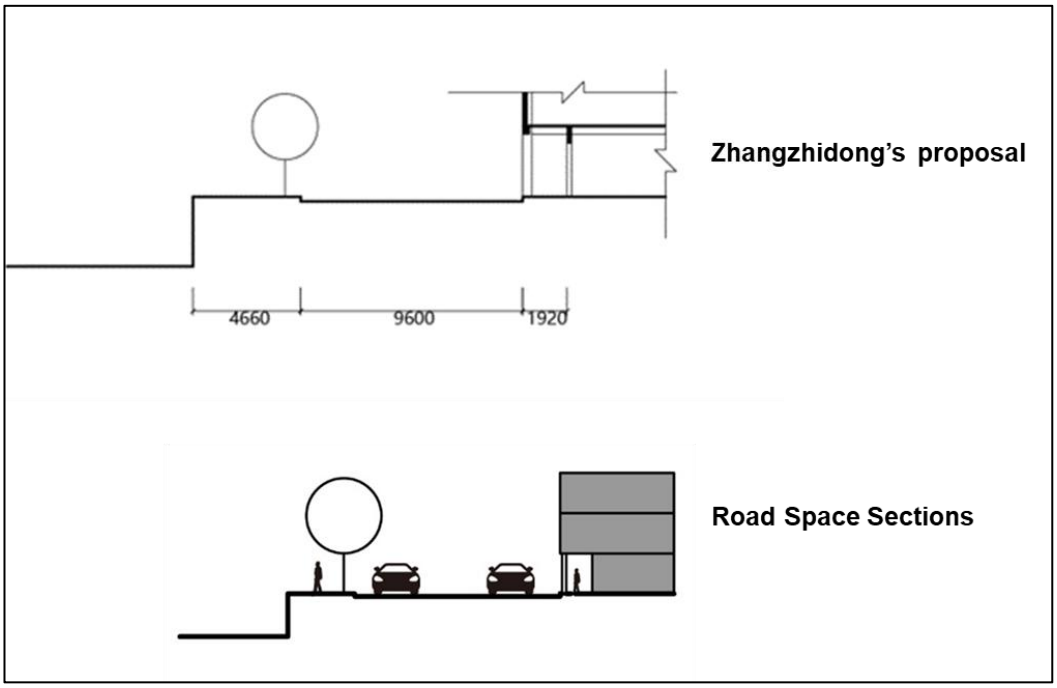


Figure 5-19 Analysis of Arcade Space Dimensions and Street Cross-Section

（Source：Compiled by the author based on Zhangzhidong's proposal）

5.4.2.1910-1920 The Street Cross-section of the Arcade Buildings

This was a significant period of transformation for old Guangzhou into a modern city. In November 1912, the "East-West Embankment Road Rules" were promulgated, defining the street pattern with pedestrian paths on both sides and a central lane for vehicles.

In the same year, the "Regulations and Implementation Rules for the Prohibition of

Buildings in the Guangdong Provincial City Police Department" were issued, becoming Guangzhou's first written building regulations. It provided detailed specifications for the ground floor space of arcade buildings: Article 14 stipulated that all houses and shops built on embankments and roads should reserve a width of eight feet (approximately 2.56m) for constructing foot arcade buildings to facilitate traffic...; Article 21 required that for new constructions with multiple floors, the height of the ground floor should not be less than one "Zhang" (approximately 3.2m) and the height of the subsequent floors should not be less than nine feet (approximately 2.88m), with the top floor allowed to be reduced by one foot (approximately 2.56m). Although the arcade building's depth of six feet provides some spaciousness, it also serves as a space for people and goods distribution, making it feel somewhat constrained in practical use. Due to the absence of restrictions on the width of roads where arcade buildings could be constructed, narrow streets might become more congested[46].

During this period, the primary street cross-section in the Long Bund was based on the river-facing frontage where the East Asia Hotel was located. arcade building spaces faced the Pearl River, creating an excellent display frontage, and the cross-sections of arcade building spaces in commercial buildings generally complied with building regulations.

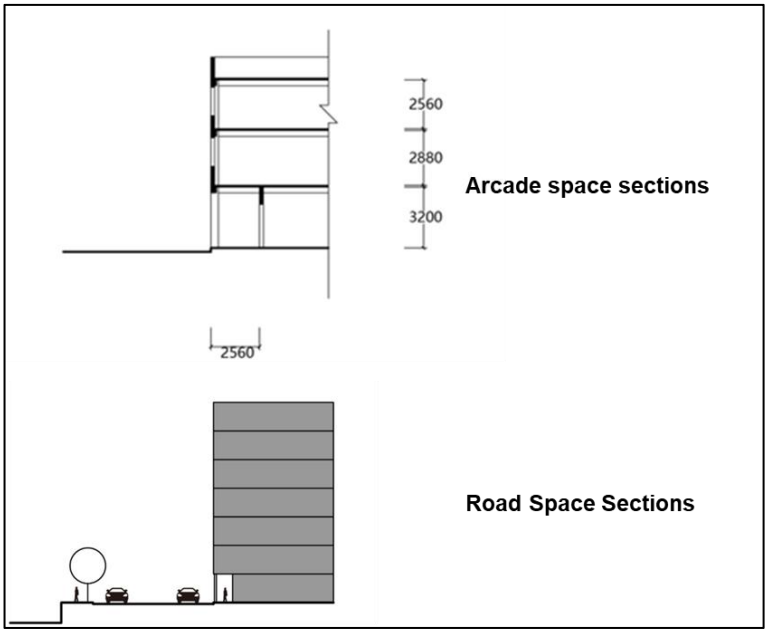


Figure 5-20 Analysis of Arcade Space Dimensions and Street Cross-Section

（Source：Compiled by the author based on “East-West Embankment Road Rules”）

During this period, Guangzhou was under the rule of the Gui clique warlords, who relied on military force to carry out large-scale demolition and road construction projects, opening up major thoroughfares within the city and laying the foundation for Guangzhou's transition into a modern city. The municipal authorities also began to refine and adjust the ground floor spaces of arcade buildings[47].

In 1920, the municipal authorities revised the "Regulations and Implementation Rules for the Prohibition of Buildings in the Guangdong Provincial City Police Department" and replaced it with the "Temporary Regulations on the Prohibition of Buildings." This new set of regulations controlled the depth and clear height of arcade building spaces based on the width of the roads. For an eighty-foot (approximately 24.3m) road, the arcade building's depth and clear height on the ground floor should be fifteen feet (approximately 4.5m). For a one-hundred-foot (approximately 30.0m) road, the arcade building's depth should be twenty feet (approximately 6.0m), and the clear height on the ground floor should be eighteen feet (approximately 5.5m). This indicates that they had already recognized the significance of arcade building ground floor spaces in shaping the urban street appearance, and believed that the depth should correspond to the width of the road, and the clear height should also match. This standardized the dimensions of arcade building ground floor spaces, ensuring a consistent and orderly appearance of the arcade building streets. The implementation of this regulatory system at that time ensured the enforcement of the regulations, leading to rapid improvements in the urban street appearance.

The Street Cross-section in the Long Bund during this period generally continued the effect of the East Asia Hotel's Street Cross-section. Additionally, the building volume continued to increase, and the size of arcade building spaces in some buildings expanded. For instance, in the case of the Chengwaidaxin Company, the arcade building space size reached 6 meters, and the clear height of the arcade building space in the middle bay could even reach 11 meters. This indicates that the setting of arcade building spaces at that time was not solely for meeting municipal requirements but also considered for the aesthetics of the buildings themselves.

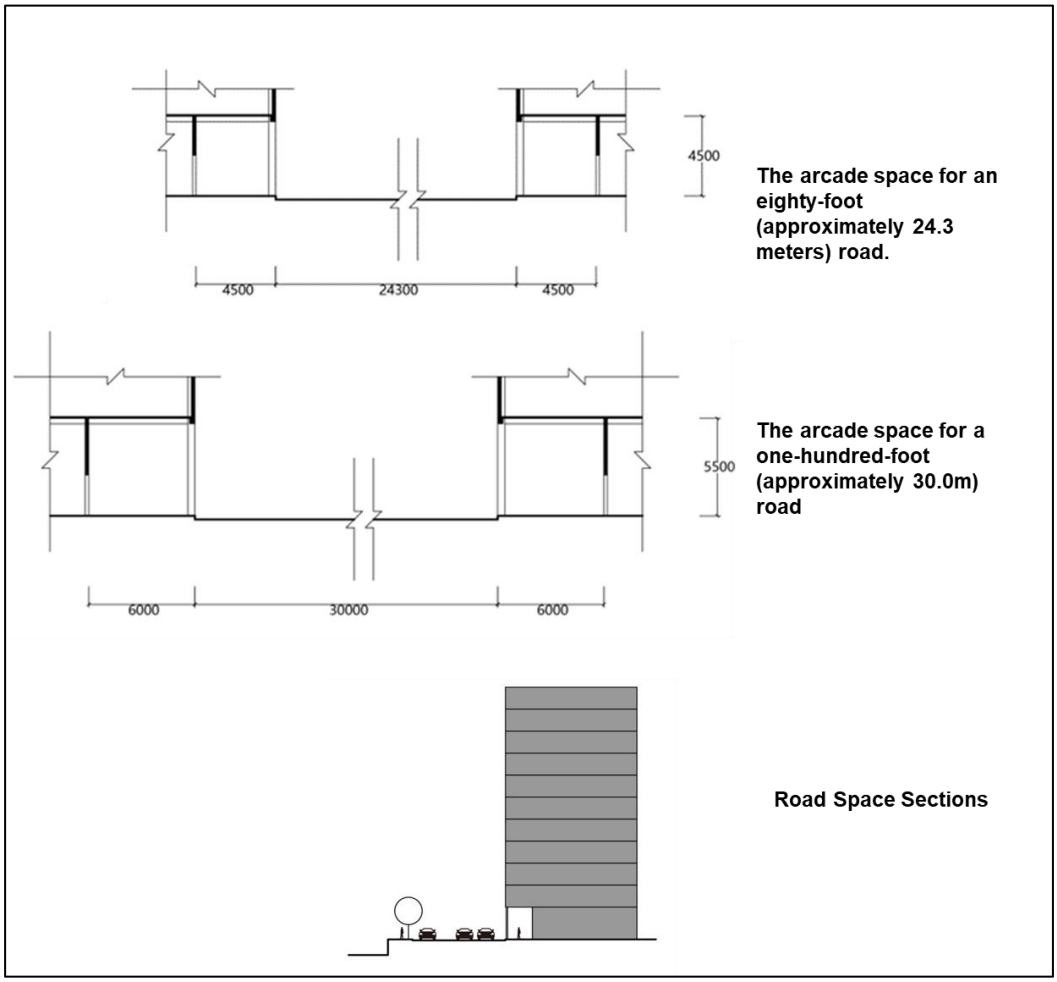


Figure 5-21 Analysis of Arcade Space Dimensions and Street Cross-Section

（Source：Compiled by the author based on “Temporary Regulations on the Prohibition of Buildings.”）

During the period from 1930 to 1940, the background of the arcade policy was that the implementation of the fifteen-foot arcade proposed by the Municipal Council faced difficulties, especially in bustling commercial areas like the Long Bund. To promote its execution, a transitional measure called "Regulations for Clearing and Opening Pedestrian Paths on the Long Bund" was promulgated in April 1923. This measure adopted two flexible approaches: first, for shop owners unwilling to demolish existing structures to build arcades, they were required to provide a ten-foot pedestrian path as a temporary solution; second, for arcades with a width less than six feet (approximately 1.82m), they were mandated to be rebuilt to a width of ten feet (approximately 3m). These measures were mainly taken for the sake of convenience in implementation. It can be seen that the Guangzhou authorities assessed the resistance encountered in the construction of arcades on the Long Bund and made concessions, hoping for gradual implementation in the future.

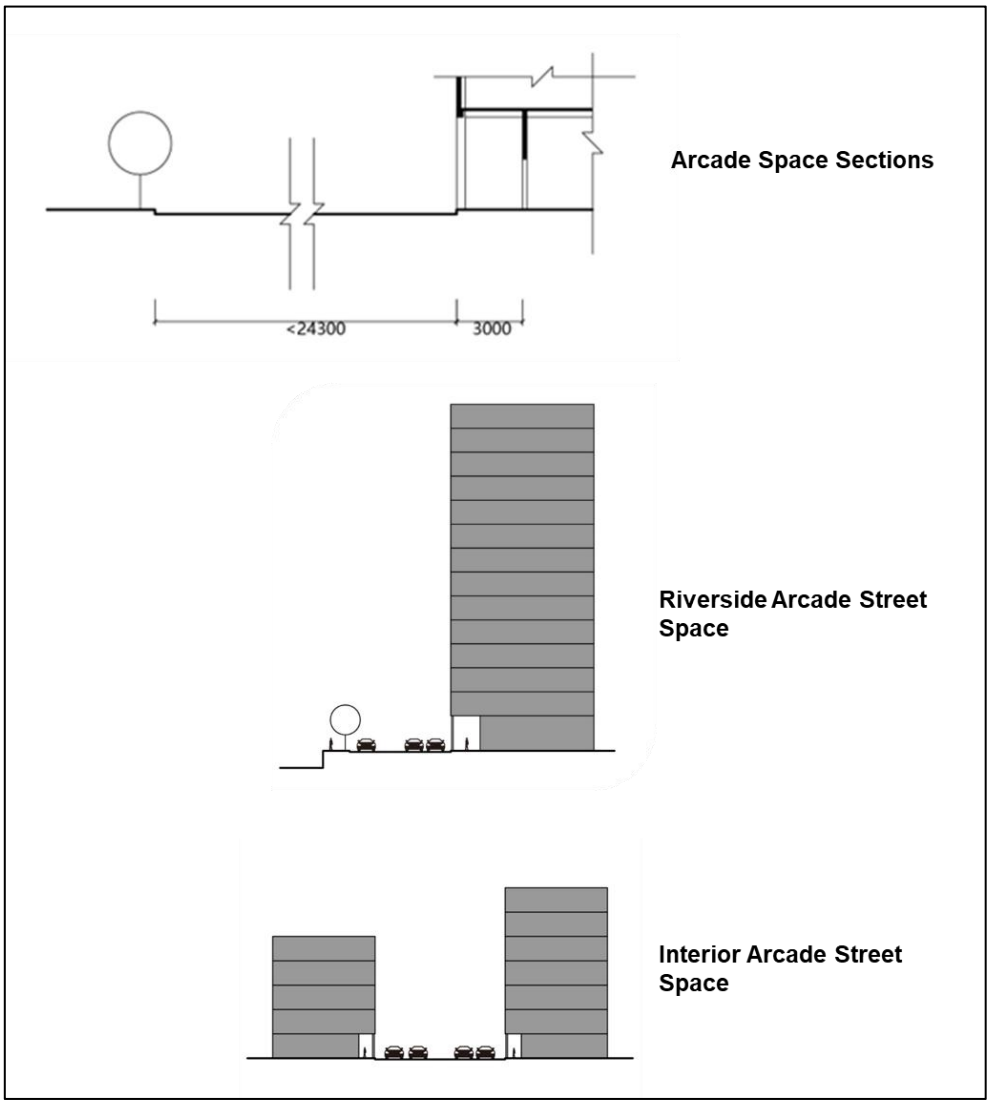


Figure 5-22 Analysis of Arcade Space Dimensions and Street Cross-Section

（Source：Compiled by the author based on "Regulations for Clearing and Opening Pedestrian Paths on the Long Bund."）

During this period, the riverside arcade section continued to follow the development pattern of the Chengwaidaxin Company, with increased building volume. However, due to the construction of Haizhu New Embankment, the riverside road, where the former East Asia Hotel was located, lost its original status and transformed into an arcade street within the city.

5.4.3.1940-2023 The Street Cross-section of a Modern Road

During this period, the ground floor space of the arcade buildings mostly followed the height of the existing arcade spaces. With the introduction of modern architectural technology, the arcade spaces along the Long Bund adopted higher section profiles. Taking the New

Aiqun Hotel as an example, as an extension of the Aiqun Hotel, its arcade space maintained the scale of the original arcade spaces.

Due to the abolishment of the arcade regulations, various non-arcade street sections appeared along the Long Bund. The main characteristic was a central lane for vehicles, flanked by uncovered pedestrian walkways. The buildings on both sides no longer adhered to the arcade form, and their ground floors did not retreat inward.

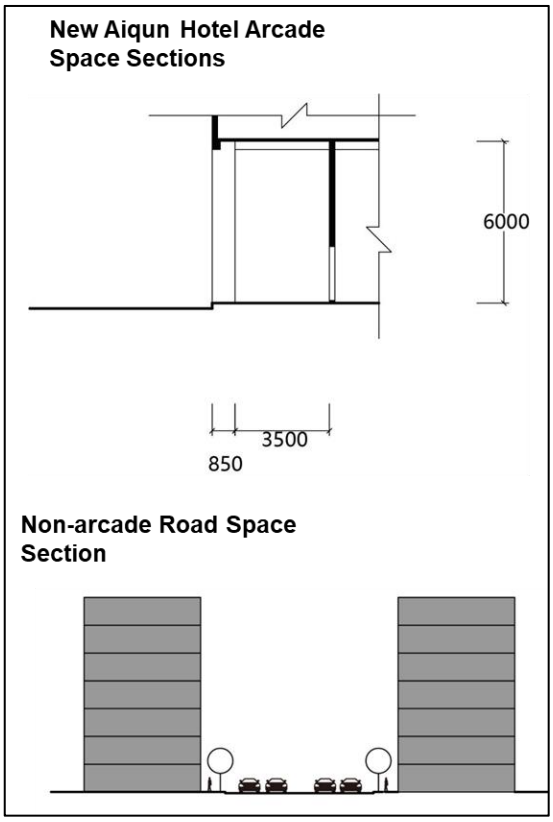


Figure 5-23 Analysis of arcade space dimensions and street cross-section

（Source：Measured and illustrated by the author）

Meanwhile, during this period, the buildings along the Long Bund experienced a wave of building renewal. In the process of urban renewal, architects began to consider harmonizing with the existing buildings, leading to the incorporation of similar morphology to the arcade in modern buildings that were not originally designed as arcades. For instance, the National Respiratory Center's arcade space serves as an example, where the architect took into account the proximity to the historic arcade building, Yongan Hall, and adjusted the arcade space accordingly.

The construction of modernized roads also led to an increase in green pedestrian

walkways along the cross-sections of the Long Bund . The National Respiratory Center cleverly created a shared resting space by stepping back the upper levels of the building, resulting in a more diverse urban spatial hierarchy than the previous green pedestrian walkway street sections.

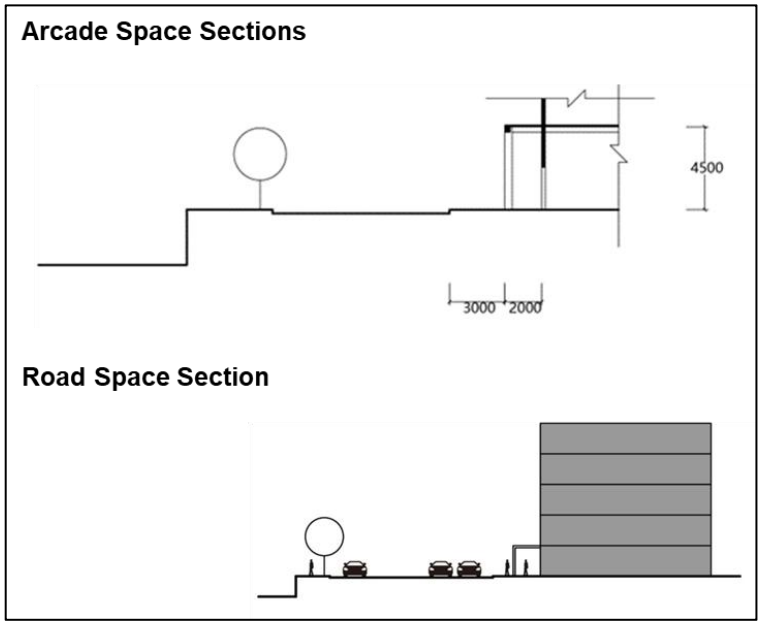


Figure 5-24 Analysis of Arcade Space Dimensions and Street Cross-Section

（Source：Measured and illustrated by the author）

5.4.4.The Arcade Spaces Historical Morphology Timeline

By sorting out the temporal development of the cross-section pattern of the riding street, the development of the riding space can be categorized from two perspectives.

The first one is the urban relationship corresponding to the riding space. On the long embankment, the early riding space was set along the embankment, and the riding space was originally used as a buffer space for commercial transactions, in order to facilitate the transportation of goods at the wharf and thus opposite to the embankment, while the riding space was gradually infiltrated into the city streets through promotion and development, forming the city streets with riding spaces on both sides, and entering into the modern era, due to the abolition of the riding system, there was a street space along the street that was set back and uncovered relative to the roadway. In the modern era, due to the abolition of the zip code system, there is a street space without a cover that is set back from the street.

The second is the scale of the space of the building, the early space of the building as a

result of just as a place of commercial transactions so that the depth and height of the scale is not very large, often can only accommodate one or two people for a short break, and with the improvement of the transportation function of the building as well as the continuous development of the commercial function of the building, for the space of the building for a further increase in the requirements of the riding space, expressed in the depth of the building as well as the height of the headroom is gradually increased for individual commercial buildings, the headroom of the building is even increased to a maximum height of 1.5 meters. For individual commercial buildings, the headroom of the building is increased to ten meters.

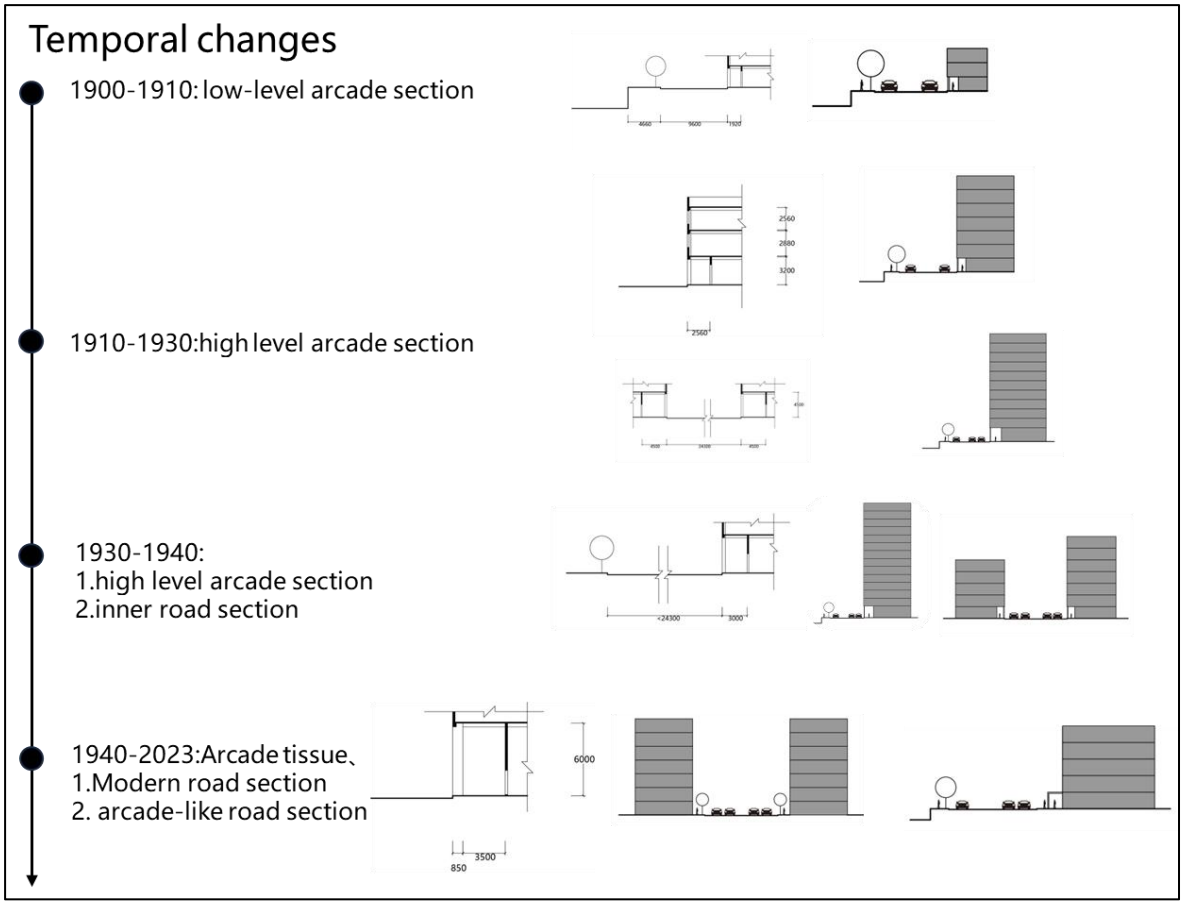


Figure 5-10 The Arcade Spaces Historical Morphology Timeline

（Source：Illustrated by the author）

5.5. The Development Pattern of the Arcade Building Type in the Long Bund

Before the Qing Dynasty, bamboo houses were the main form of architecture in

Guangzhou. These low-rise buildings had narrow frontages and deep interiors, constituting the basic spatial style of residences with various adaptations based on their functions. In commercial settings, the "front shop, rear house" layout was common, with street frontages typically only 3-4 meters wide, and the depth varying depending on the street and alley conditions, as well as the specific business requirements. The depth usually ranged from 8 to 12 times the width, approximately 30-40 meters. Two buildings were built facing away from each other and facing different street corners. Buildings primarily dedicated to shops had smaller depths, only a few meters, while integrated businesses could extend several tens of meters inward, forming the building type known as "front shop, rear house."

From historical photos, it can be observed that early commercial buildings along the Long Bund generally adhered to the prototype of bamboo houses, presenting a multi-story building with single-bay width. This building form typically had a bay width of around 4-5 meters and an extremely long depth. Due to the deep interior, the ground floor shop's display area and main entrance were often in the same space. At this time, the concept of arcade space had not yet evolved into specialized functions. Instead, it served as a shared space for urban transportation, commercial displays, and primary and secondary entrances to the building. All three functions influenced the design of arcade space. The urban transportation function required the arcade space to connect with other buildings along the street width, while the depth of the arcade space needed to accommodate pedestrian traffic. The need for a visible display space to attract customers also required the arcade space to have visual transparency along the street interface. The characteristics of the beam-column structure provided minimal visual obstruction, fulfilling the functional requirement of the arcade space along the street interface, while also allowing the arcade to remain relatively open for loading and unloading goods.

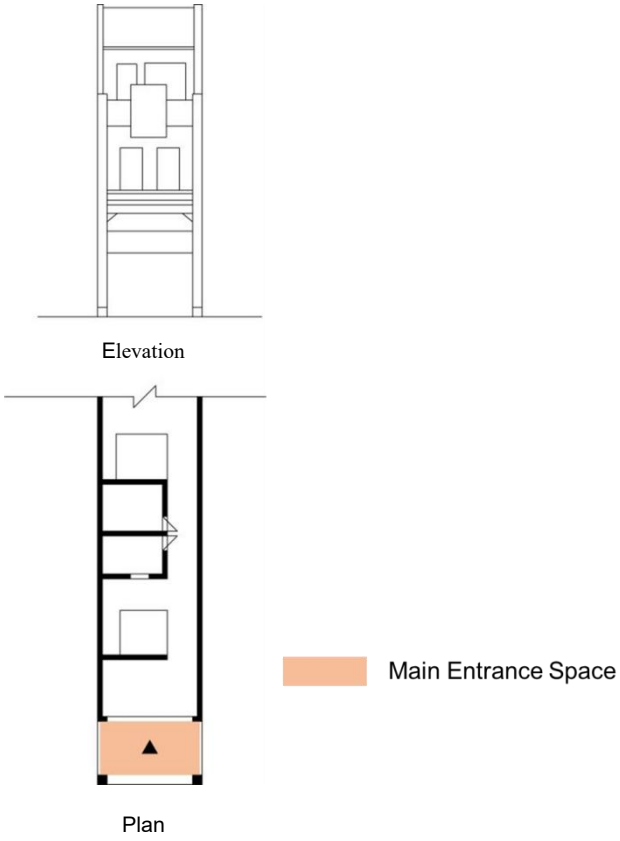


Figure 5-25 Early Arcade Building Morphology Analysis

（Source：Measured and illustrated by the author）

With the opening of the Long Bund in the 1910s and 1920s, the commercial value of the Long Bund significantly increased, leading to the development of taller and wider commercial buildings. For instance, the East Asia Hotel built by the Sincere Company resulted from the merging of several preexisting bamboo house plots. Analyzing the ground floor plan and elevation of the East Asia Hotel reveals the initial functional differentiation and inheritance of arcade spaces. Due to the restrictions of arcade regulations, the arcade space in the East Asia Hotel continued to serve as a transportation space for urban functions. Thus, it retained some characteristics of the previous period's transportation space. Meanwhile, the commercial function of arcade spaces began to differentiate. Within the central span of the ground floor arcade space of the East Asia Hotel, the area served as the main entrance space and unloading area, while the two lateral spans functioned as commercial display spaces. The treatment of the overall appearance of the arcade also indicates an enlargement in size for the central span, where the main entrance is located. At this time, the size of the arcade spaces was still subject to arcade regulations, resulting in a strong similarity in arcade spaces among different

buildings.

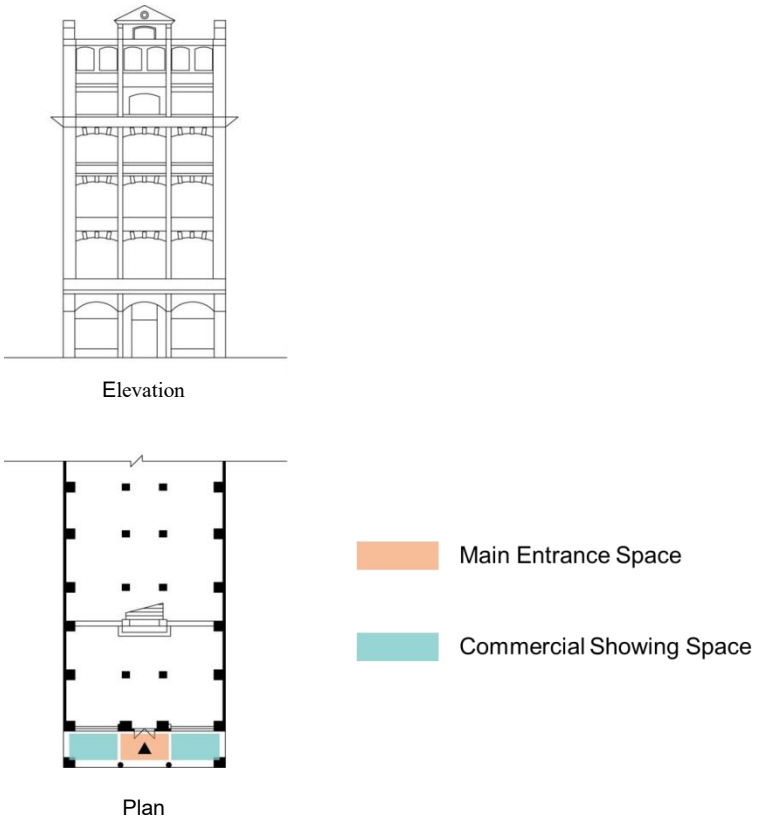


Figure 5-26 East Asia Hotel Morphology Analysis

（Source：Measured and illustrated by the author）

In the 1920s and 1930s, as the Long Bund underwent further renovation, some newly reclaimed land provided opportunities for new constructions. The City Outside New Company emerged as a new type of commercial department store building on this newly reclaimed land. During this phase, the building tissue continued to expand in the width direction, characterized by an enlarged arcade pattern. With the further enlargement of the building volume and the introduction of the new department store type of building, the functions of the arcade space became more diversified.

Through survey plans and historical records, it can be observed that the arcade space had already undergone further differentiation based on the foundation laid by the East Asia Hotel. On the floor plan, this differentiation manifested as the entrance porch corresponding to the main entrance, the entrance porch corresponding to the secondary entrance, and the space for displaying goods corresponding to the commercial display showcases. Additionally, the commercial unloading entrance was also arranged at one end of the arcade space.

From the elevation view, it can be seen that the porch space of the main entrance was emphasized, exceeding the arcade space clearance specified by the regulations of that time. The continuous arcade passage space was interrupted at the middle span of the building, and the building's individuality began to stand out. During this period, the urban space was characterized by expanded arcade spaces.

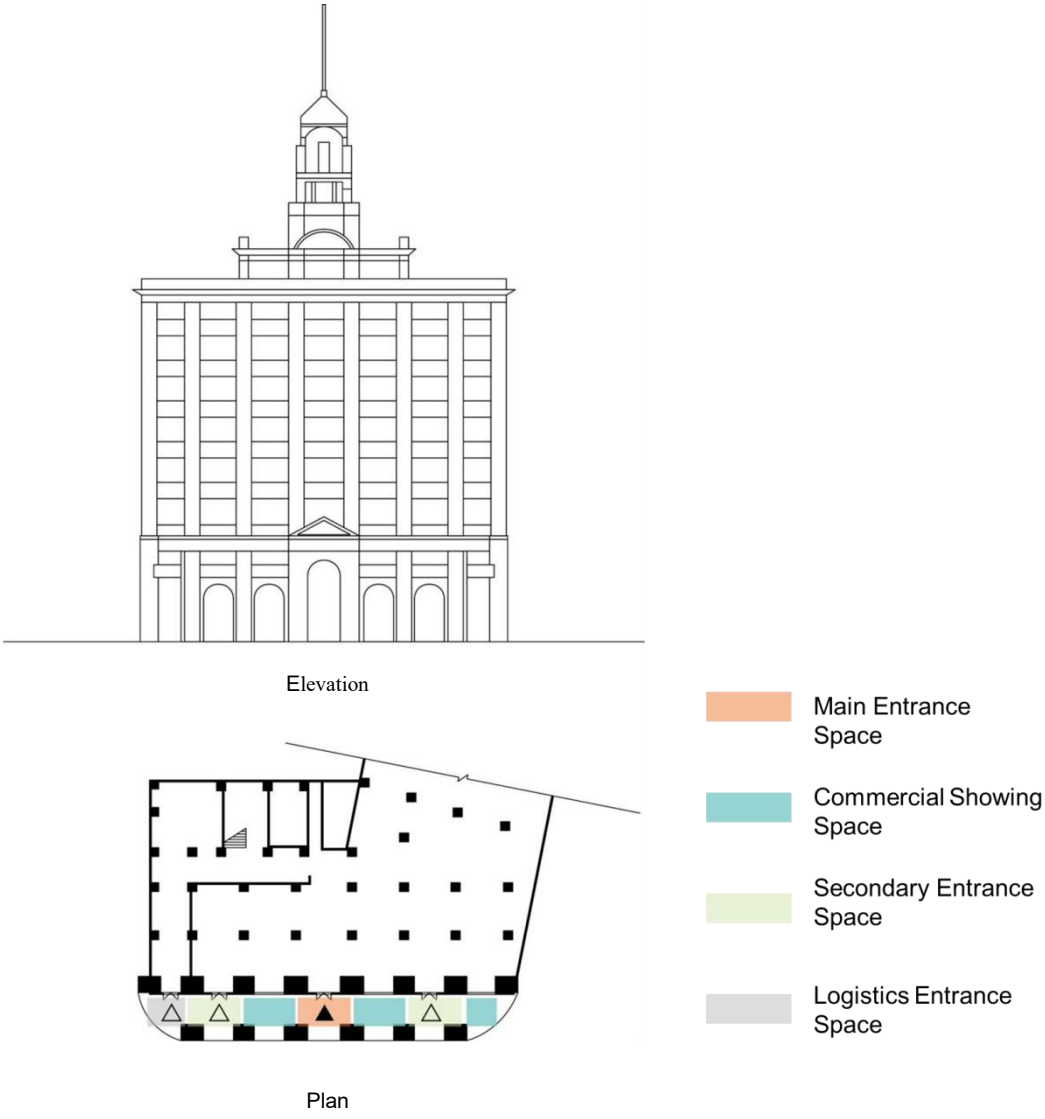


Figure 5-27 Chengwaidaxin Company Morphology Analysis

（Source：Measured and illustrated by the author）

In the 1930s and 1940s, the construction of the Aiqun Hotel ushered Guangzhou's commercial architecture into a new era. During this period, the tissue of the Aiqun Hotel was not only characterized by an enlarged plot, but also by a unique street corner position. Most

arcade buildings typically have one street-facing facade, but the Aiqun Hotel, occupying a street corner, gained two urban display faces. Furthermore, due to its further modernization and increasingly complex functions, the building's arcade space underwent further differentiation from the Southern Building (Nanfang Dasha) as its foundation.

Within the arcade space of the Aiqun Hotel, spaces corresponding to various functions began to emerge. These included commercial display spaces corresponding to restaurants, entrance porch spaces corresponding to the main entrance, logistical spaces corresponding to the rear entrance, and more enclosed arcade spaces corresponding to traffic spaces. Different treatments were applied to the interfaces of these various spaces along the street-facing facade. The main entrance space and the commercial space were emphasized and enlarged, while arcade spaces corresponding to secondary functions were partially obscured in terms of the interface treatment.

Regarding the external facade treatment, the arcade's columned corridor was reinforced, and unified considerations were given to the building's front section, strengthening the building's sense of independence and individuality.

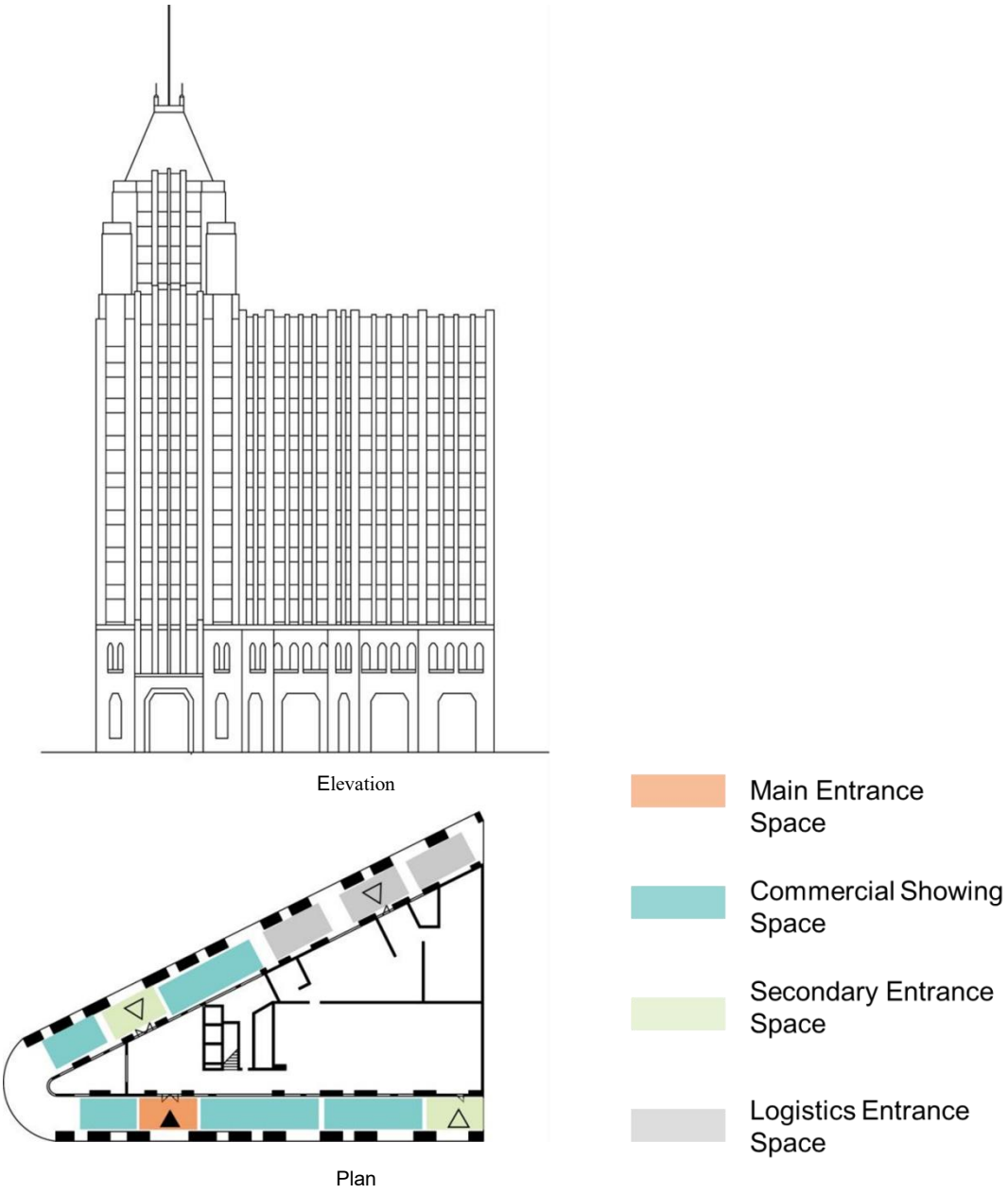


Figure 5-28 Aiqun Hotel Morphology Analysis

（Source：Measured and illustrated by the author）

The impact of this functional differentiation is that the urban space during this time did not manifest as recessed urban space but rather as a segmented urban space interrupted by arcade interfaces. This had an effect on people's perception of the urban landscape. Initially, people experienced the interior arcade spaces of commercial buildings, but it shifted towards perceiving the elements of arcade space, particularly the arcade's columned corridor.

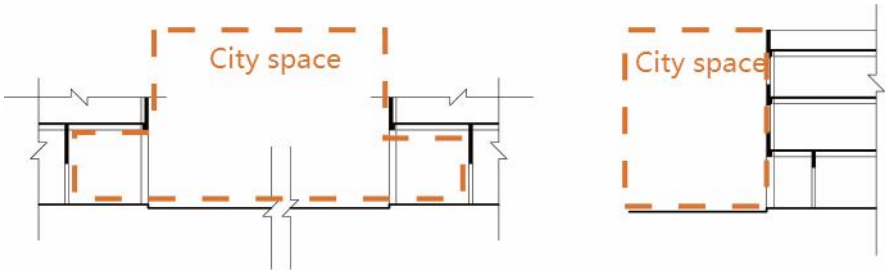


Figure 5-29 The two ypes of arcade formations have resulted in distinct urban spaces.

（Source：Illustrated by the author）

At this time, the ground floor spaces of buildings still served as transportation hubs within the city, allowing people to observe the relationship with adjacent buildings from the height of the space. The traffic function of arcade spaces was inherited both in terms of space and the dimensions of the outer facade.

This differentiation of arcade spaces was also continued in later buildings along the Long Bund in the 2020s, as seen in the renovated Industrial and Commercial Bank of China branch. Various spaces were differentiated, including the logistics and parking spaces corresponding to the densely-columned arcades, the enlarged arcade spaces for the main entrance, and the arcade spaces for secondary functions. The concept of "type process" proposed by Caniggia records the temporal changes of the basic types of houses and plot units as the minimum elements of the urban built environment, considering them as a tool for interpretation. The process of functional differentiation led to specialization, with each function requiring its own exclusive space, resulting in a specialized spatial pattern.

This differentiation of arcade spaces had a significant impact on the urban environment. Instead of presenting a concave-shaped urban space, the arcade interfaces resulted in a segmented urban space. People's perception of the urban landscape shifted from focusing on the ground floor spaces within the commercial arcades to the arcade's elements, specifically the colonnades.

During the 1930s to 1940s, the construction of Aiqun Hotel marked a new era for Guangzhou's commercial architecture. The building not only expanded the plot size but also occupied a street corner, providing two urban display facades. With further modernization, the building's functions became more complex, leading to the further differentiation of arcade spaces. Different spaces emerged, including those corresponding to restaurants for

commercial displays, those corresponding to the main entrance for porches, and those corresponding to logistics for the rear entrance. The arcade spaces along the street were adapted accordingly to suit these different functions, resulting in an enhanced colonnade structure along the facade, which reinforced the building's distinctiveness.

The differentiation of arcade spaces has resulted in varying urban spaces. We can classify the arcades into two types: the corridor-dominant arcades and the colonnade-dominant arcades. The corridor-dominant arcades are mainly characterized by their function as urban transportation spaces and form the basis of the arcade street scene, represented by most single or triple arcade building morphology. On the other hand, the colonnade arcades are characterized by increased building volume and functional differentiation, which has contributed to the individualization of the arcade street with continuous and unified arcade spaces that display variations in scale and form.

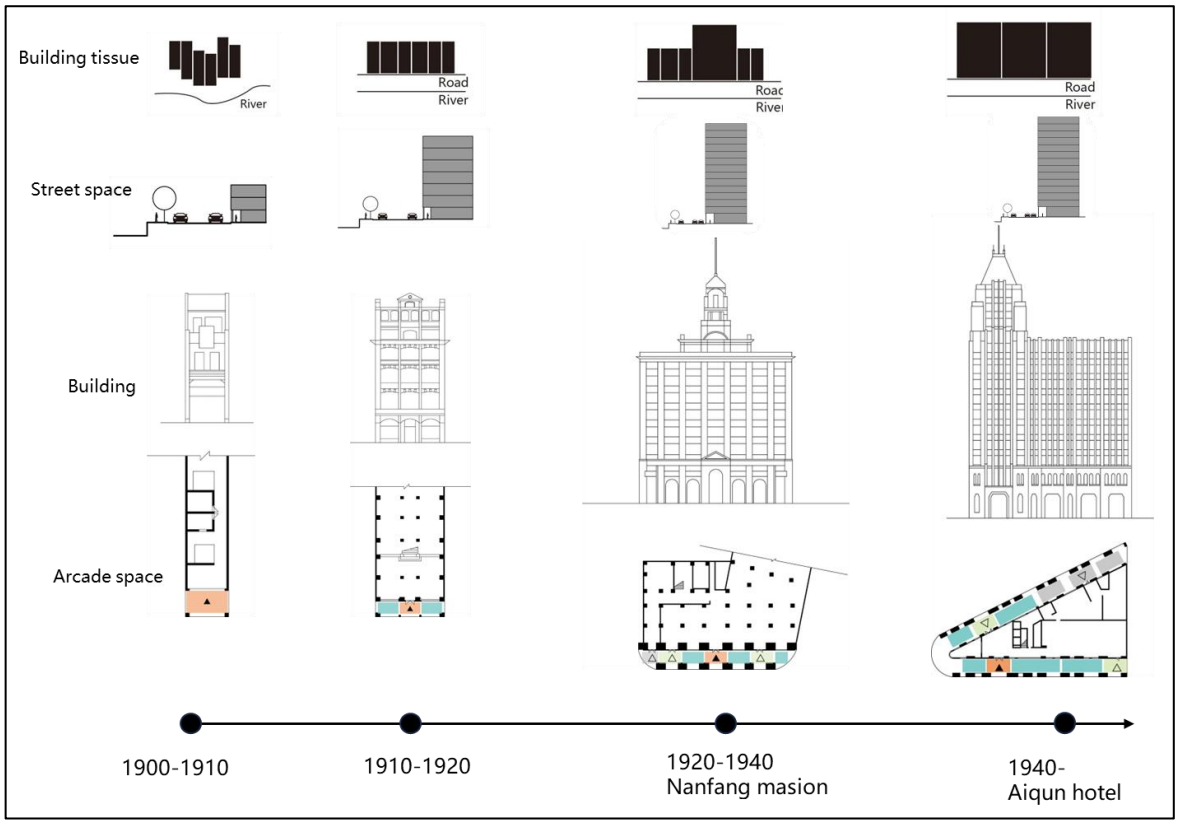


Figure 5-29 The Long Bund Arcade Type Development Timeline

（Source：Illustrated by the author）

After 1940, more modern canopy-free pedestrian paths were introduced, rapidly

replacing the traditional arcade streets and creating a modern street landscape. However, modern street spaces, with their separation of pedestrian functions from the interior spaces of buildings, lack the distinctive interface that traditional arcade streets offered.

In recent years, with the construction of new buildings along the Long Bund, architects have begun to recognize the contextual connection between new and existing buildings. The National Respiratory Center serves as an example of how building elements have been employed to repair arcade spaces. The use of colonnades and horizontal eaves in the building pays tribute to the existing arcade spaces, emphasizing the continuity of the arcade's public nature. Although the building may no longer be called an "arcade building" in terms of form, its spatial essence still reflects the spirit and essence of arcade spaces.

5.6.Summary of the Morphological Characteristics

5.6.1.Summary of Building Tissue Characteristics

The development of arcade building tissue is influenced both by the limitations of traditional bamboo house tissue and the constraints of arcade systems. As a result, individual arcade buildings have shown a tendency towards becoming independent structures, yet they are still unable to completely detach from the surrounding buildings. Due to the regulatory norms governing the ground floor spaces of arcades, the building ground floor exhibits a consistent spatial pattern, forming a continuous and connected space. Consequently, the essential characteristics of arcade street tissue lie in the continuity of tissue and the uniformity of interfaces, which are fundamental features of the arcade street tissue.

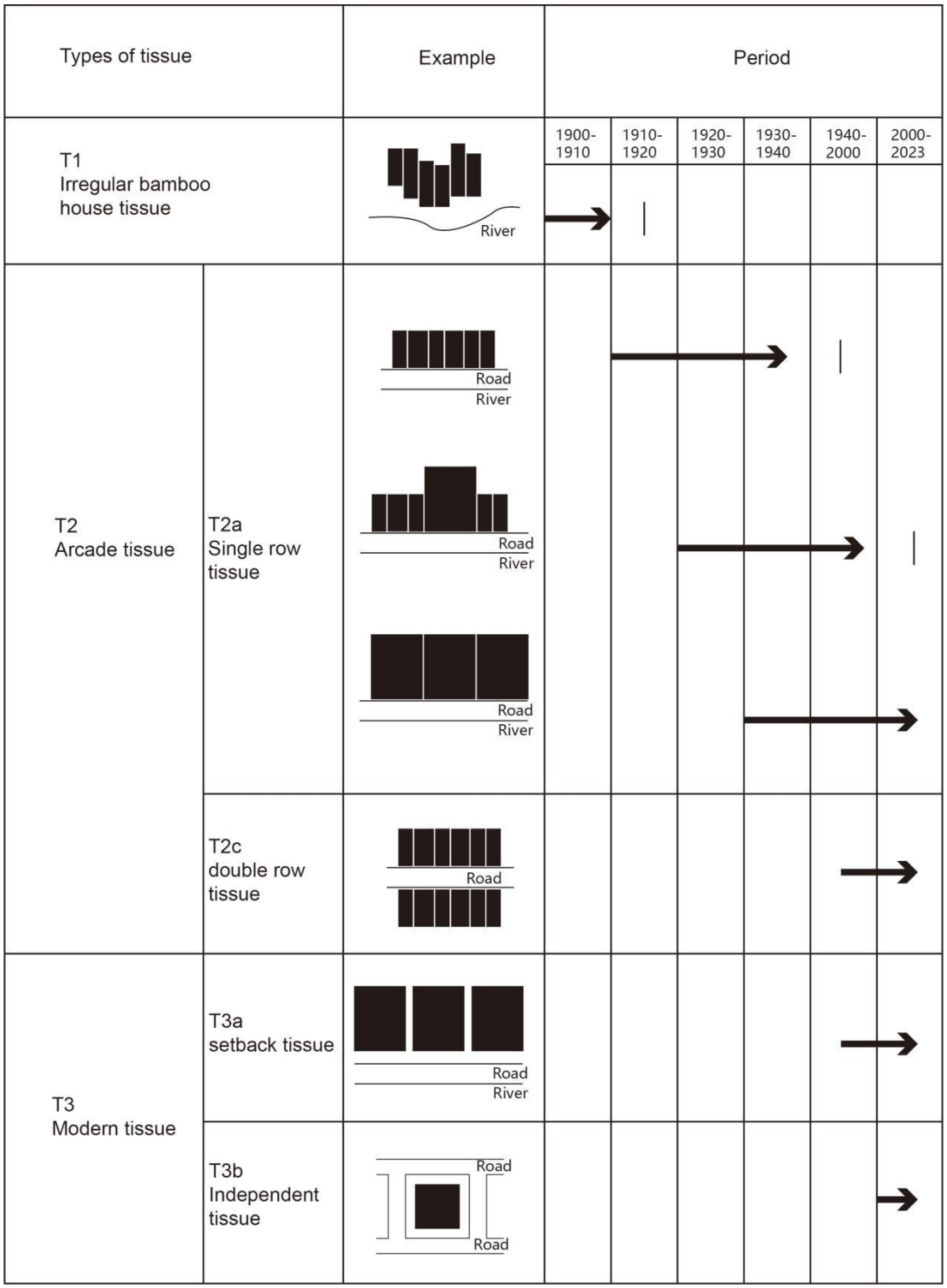


Figure 5-31 Analysis of Building Tissue Characteristics

（Source：Illustrated by the author）

5.6.2.Summary of Building Form Characteristics

The building form of arcade buildings gradually developed into two distinct types. The first type consists of ground-level arcade spaces primarily serving transportation and

showcasing internal commercial activities. Due to constraints in the width and functions, this type represents arcade spaces that were not fully differentiated at that time. The ground-level spaces maintain similar dimensions to the surrounding arcades and are not prominently emphasized. This form of arcade buildings, ranging from the earliest ones to later ones with modernist features, is commonly found in the urban landscape of arcade streets. This type of arcade architecture reflects the public nature of arcade spaces, aiming to be open towards the street, with the commercial interfaces inside the arcade becoming the focal points of the arcade street's display.

The second type of arcade space differentiation represents the transition from the large-scale arcades of companies like "Changwai Daxin" to high-rise and large-volume arcades like the "Aiqun Hotel". These types of arcades often have more complex functions compared to arcades with fewer spans. They also offer more varied arcade spaces, and their treatment of external interfaces is more enriched compared to the corridor-type arcades. This type of arcade often incorporates the columned spaces of the ground-level arcade as part of the overall composition of the building, attempting to include the external interfaces of the ground-level space within the scope of the entire building interface. This form of arcade architecture reflects the building attributes of the ground-level arcade space, emphasizing the overall image, with the external columned interfaces becoming the display focus of the arcade street.

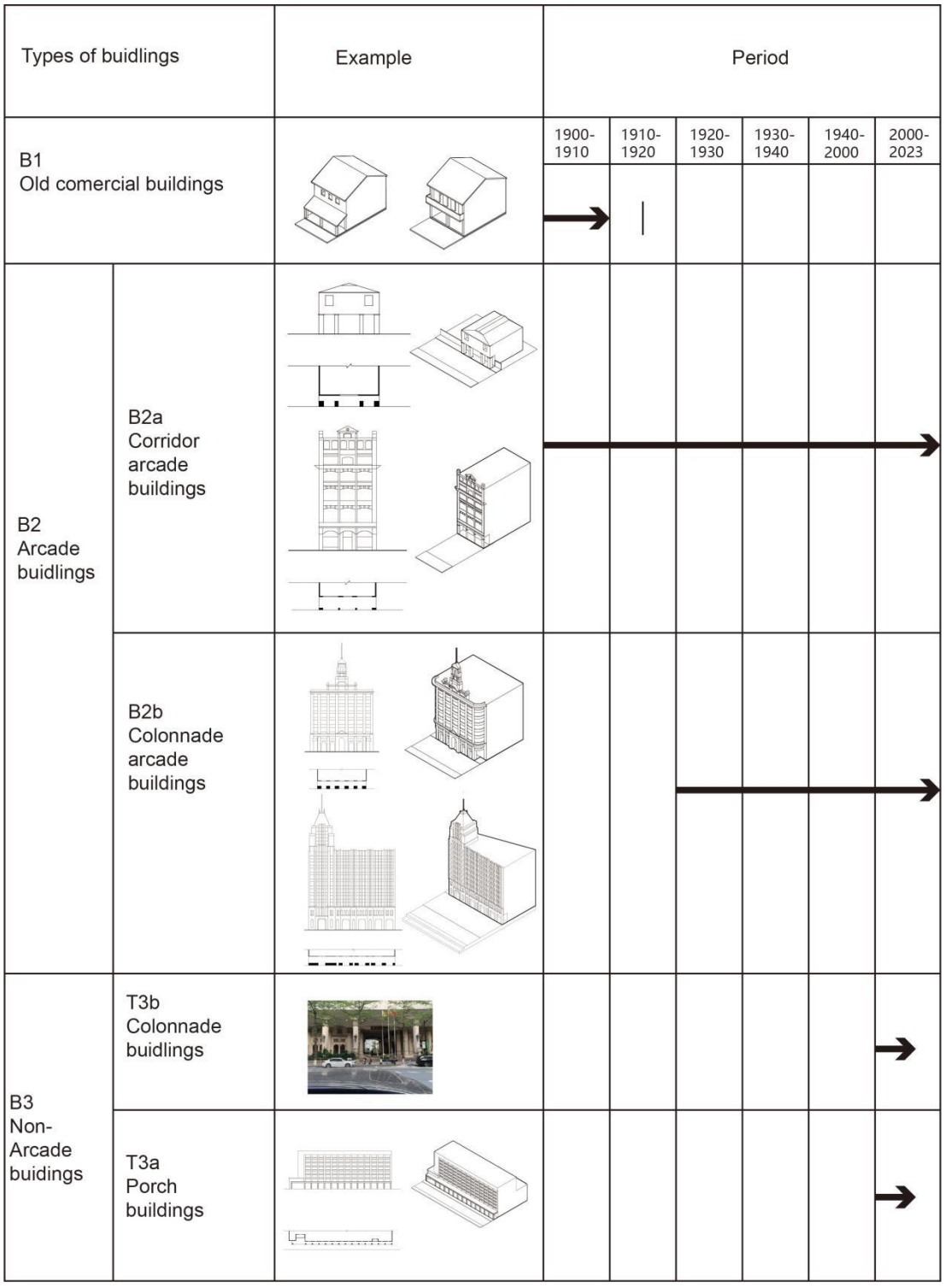


Figure 5-32 Analysis of Building Morphology Characteristics.

（Source：Illustrated by the author）

5.6.3.Summary of Street Space Form Characteristics

The streets of the Long Bund with arcade buildings can be categorized into two types: the streets facing the Pearl River, where the arcade buildings have undergone gradual height

increases and changes in arcade spaces over time. The other type consists of streets with arcade buildings on both sides. Due to restricted perspectives and limited street widths, the buildings on these streets maintain relatively consistent heights and volumes.

The riverside arcade streets benefit from their spacious geographical location, giving them a characteristic of being urban display surfaces. On the other hand, the arcade streets within the city exhibit a closely arranged tissue and suitable road widths, making them more conducive to commercial development.

In modern times, the streets are divided into two types: those with buildings recessed backward, with pedestrian sidewalks exposed; and those with buildings extending a portion of their public space as shared street spaces.

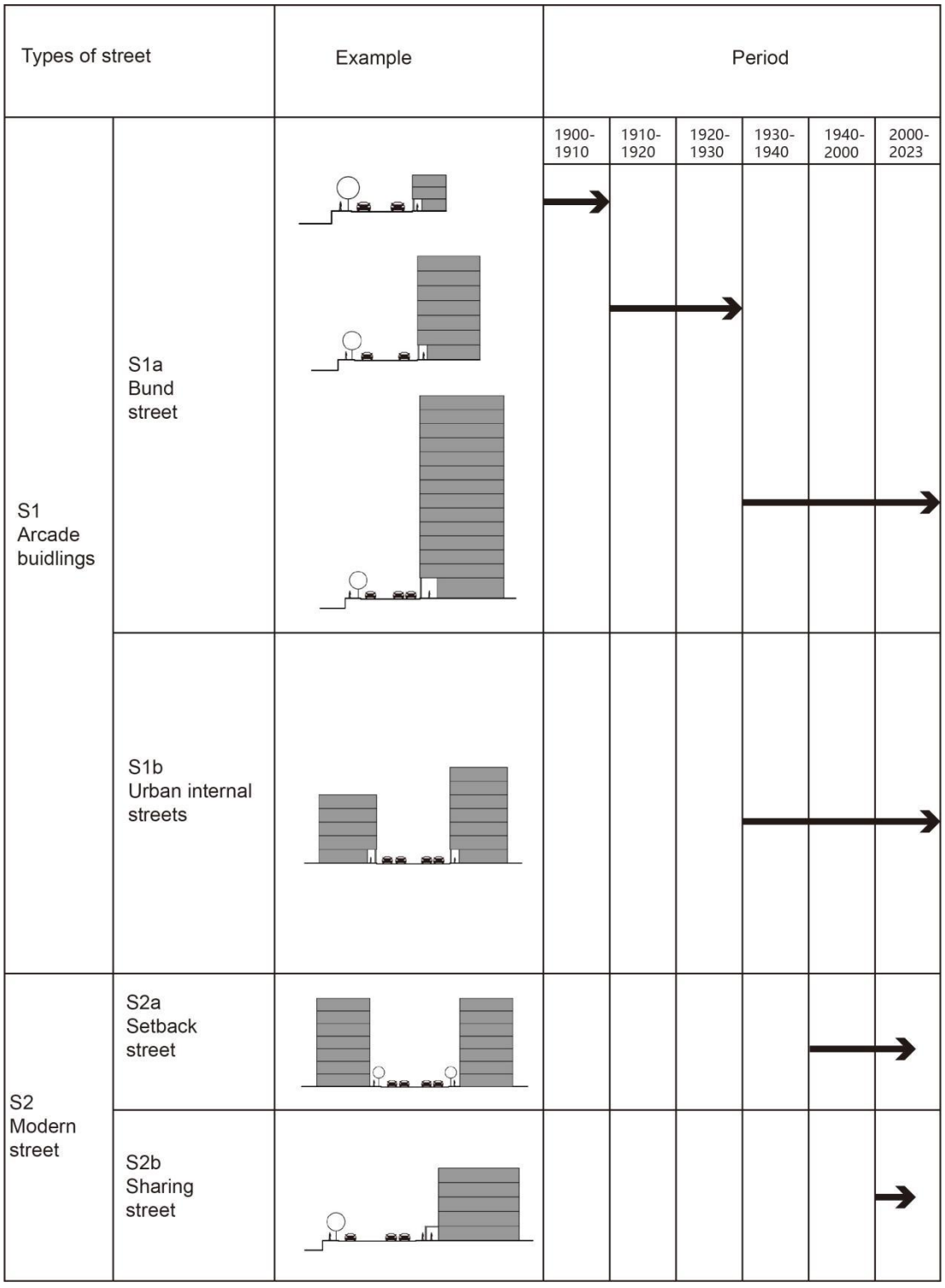


Figure 5-33 Analysis of Street Section Characteristics

（Source：Illustrated by the author）

5.7.Summary of This Chapter

This chapter mainly applies the localized morphological typology framework to the site. With respect to the research object, appropriate adjustments are made to the scope of the study.

Through a diachronic analysis of typological development, the evolution patterns of architectural forms are summarized.

With the increase in building volume and the complexity of building functions, the architectural forms of arcade buildings have gradually diversified. Early arcade buildings focused on spatial permeability at the ground level, while later columnar arcade buildings emphasized the symbolic nature of the ground floor space. The ground floor space of arcade buildings became more versatile. In this chapter, arcade buildings are divided into two types, and the characteristics of each type are summarized. This classification serves as the basis for the division of the morphological zoning map in the next stage.

Chapter 6 Detailed Design of Arcade Street Buildings

6.1.Morphological Design Guidelines Based on Building Tissue Zoning

According to Caniggia, among all the components that constitute the urban landscape, the larger the scale of a component, the more stable its typology becomes. As the development of the Long Bund has only taken a few decades and has not yet formed completely distinct tissues, its tissue still bears significant similarities. One type of building tissue may correspond to different types of buildings. Therefore, zoning based on building tissue for morphological design is relatively more stable and enduring. Through the previous section's typomorphological analysis of the Long Bund block, specific typological divisions can be derived, leading to the study of its characteristics and evolutionary processes.

Building upon this foundation and considering the characteristics of urban morphology, tissue zoning will be carried out based on the current site conditions. Specific morphological design criteria will be formulated for each tissue zone, which will control the morphology of the study area and propose corresponding measures for intervention. This will effectively guide the building form in the area. The specific morphological design criteria will address different building types within different tissue zones.

Figure 6-1 Typomorphology Zoning Map of the Site's Building Tissue.

（Source：Illustrated by the author）

6.1.1.Arcade Tissue Building Morphology Design Guidelines

Arcade building tissue, as mentioned earlier, is divided into two categories: double row tissue and Single row expansion tissue. These two types of tissue correspond to two different types of arcade buildings: the double row tissue corresponds to the corridor arcade building, and the single row expansion tissue corresponds to the colonnade arcade building. In the design control of these two types of arcade buildings, the following principles should be considered.

For the colonnade arcade building

its building tissue characteristics include being located on one side of the road, with a

multi-bay and medium to high-rise arcade building tissue that has a good urban display surface. Its building form characteristics are as follows:

（1）Emphasis on the aesthetic function of the arcade building's colonnade space,

（2）Emphasis on the visibility of the ground floor arcade space.

（3）Attention to the variation of the arcade space.

（4）Consideration of the arcade space as an integral part of the building.

（5）Paying attention to the overall proportion of the arcade building.

For the corridor arcade building

its building tissue characteristics preserve the small bay and low-rise form division of early bamboo houses, as well as a neat and continuous urban main facade. Its building form characteristics are as follows:

（1）The ground floor space serves as commercial display space with strong transparency,

（2）The ground floor arcade space exhibits visual continuity.

（3）Clear distinction between the appearance of the arcade building's ground and upper floors.

Based on these characteristics and principles, combined with the actual survey data of the site, more detailed morphological design guidelines can be further developed.

Figure 6-2 Typomorphology Zoning Map of the Site's Arcade Building Tissue.

（Source：Illustrated by the author）

T2c Tissue (Single row expansion tissue) Building Morphology Design Guidelines:

（1）Building Tissue Morphology Design Guidelines

The principles to be followed in building tissue morphology design are the continuity of the main facade and the continuity in building scale. The specific form requirements for these principles are as follows:

The building openings should face the street, and the facade along the street should be consistent with the road interface, ensuring that the facade along the street is designed as the main facade of the building.

For urban street tissue, arcade buildings are mostly single-bay or triple-bay structures. According to practical considerations, the width of the building along the street should be

within 5-15m (1-3 spans), and the height of the building should be within 10-21m (2-4 stories).

（2）Building Morphology Design Guidelines

The principles to be followed in morphology design intervention are the recognizability and spatial continuity of the arcade space as a part of the urban traffic function.

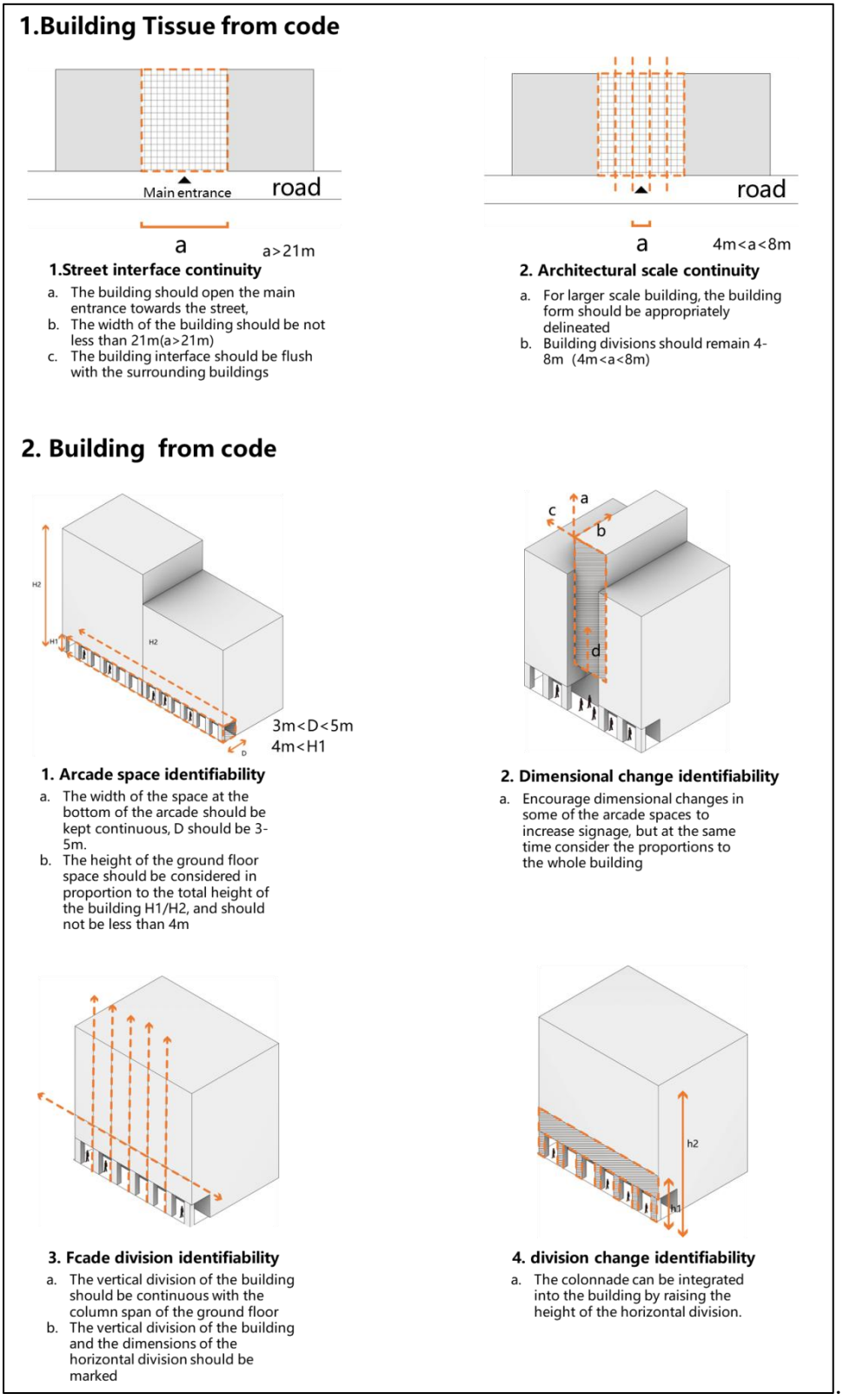
Continuity of Arcade Building's Bottom Space: The bottom space of arcade buildings must maintain continuity to create a good walking experience. The depth of the bottom space should be within 3-5m, and the exterior height of the arcade bottom space should maintain continuity, forming visual continuity of the arcade space with a height between 3.5-5m. The elevation of the arcade bottom space should remain consistent, and the ground floor elevation of the shops can be determined as needed.

Recognizability of the Arcade Facade: The division lines of the arcade's exterior facade should maintain a certain continuity. The horizontal division should be maintained within 4-5.5m to create a horizontal line in the urban image, implying the differentiation between public and private spaces.

（3）Arcade Space Morphology Design Guidelines

For corridor arcade buildings, further morphology design intervention guidelines can be applied. The street interface of the arcade building should ensure transparency in the building's depth direction, while the internal interface of the arcade space should establish certain boundaries to create a continuous and complete urban space. In the layout of the arcade, the internal openings should correspond to the arcade colonnade on the exterior.

For colonnade arcade buildings, further morphology design intervention guidelines can be applied. For colonnade arcade buildings with multiple spans, appropriate changes in opening width and height can be made at corresponding spans of the arcade bottom space, while maintaining the consistency of the exterior height of the arcade space.



1.Street interface continuity

a. The building should open the main entrance towards the street,
b. The width of the building should be not less than 21m(a>21m)
c. The building interface should be flush with the surrounding buildings

2. Architectural scale continuity

a. For larger scale building, the building form should be appropriately delineated
b. Building divisions should remain 4-8m (4m<a<8m)

1. Arcade space identifiability

a. The width of the space at the bottom of the arcade should be kept continuous, D should be 3-5m.
b. The height of the ground floor space should be considered in proportion to the total height of the building H1/H2, and should not be less than 4m

2. Dimensional change identifiability

a. Encourage dimensional changes in some of the arcade spaces to increase signage, but at the same time consider the proportions to the whole building

3. Fcade division identifiability

a. The vertical division of the building should be continuous with the column span of the ground floor
b. The vertical division of the building and the dimensions of the horizontal division should be marked

4. division change identifiability

a. The colonnade can be integrated into the building by raising the height of the horizontal division.

Figure 6-3 Morphology Design Guidelines for T2c Buildings Tissue.

（Source：Illustrated by the author）

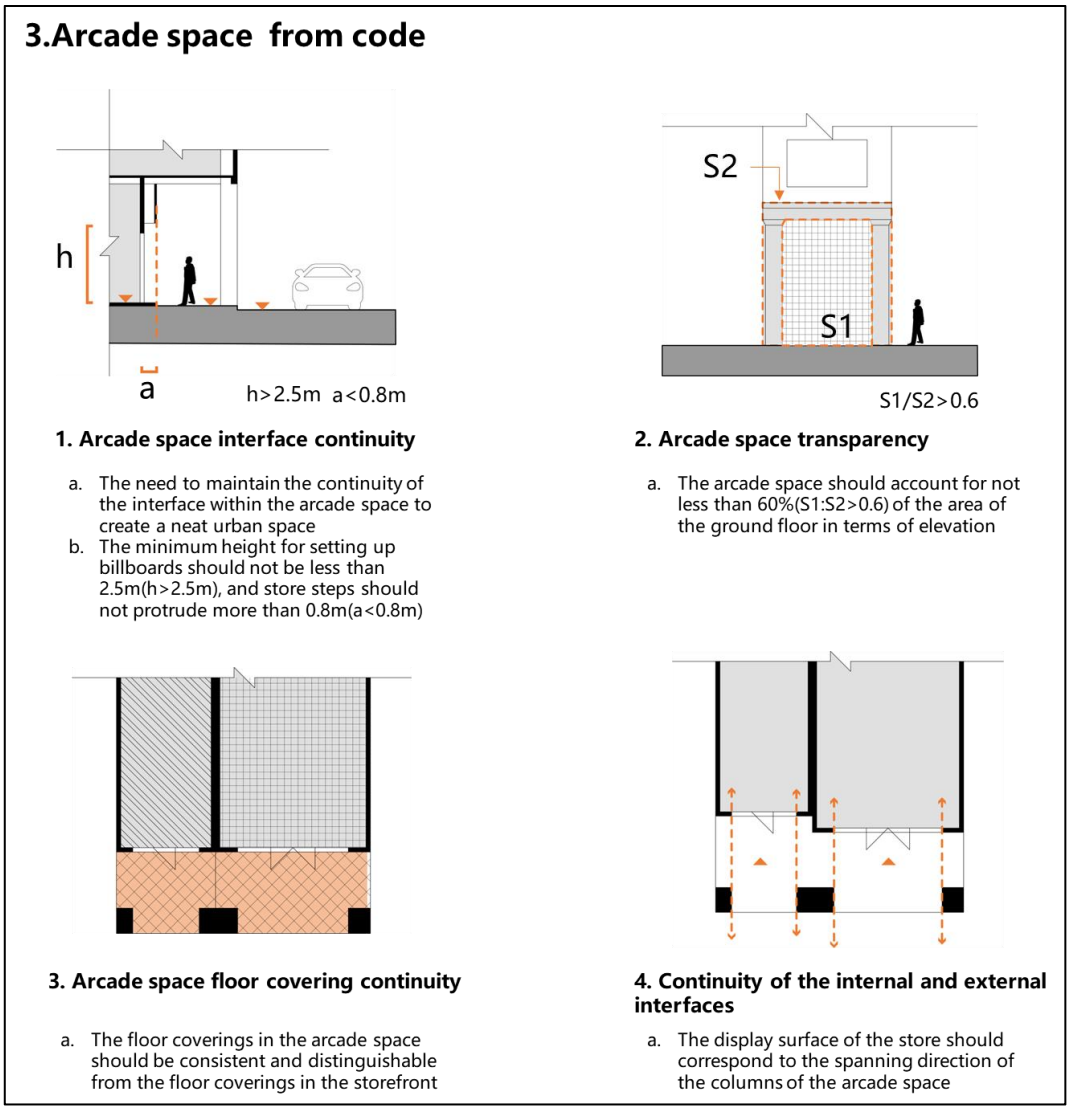


Figure 6-4 Morphology Design Guidelines for T2c buildings Tissue.

（Source：Illustrated by the author）

T2d Tissue (Double row tissue) Building Morphology Design Guidelines:

The scale of riverside arcade building plots is often larger compared to the arcade buildings in the inner city. These buildings have larger volumes, more complex functions, and are predominantly colonnade arcade buildings. In the design of form guidelines, emphasis should be placed on the visibility of the arcade space.

（1）Building Tissue Morphology Design Guidelines

As this type of tissue still retains the basic characteristics of arcade buildings, the tissue guidelines still emphasize the continuity of the tissue.

Continuity of Street Interface: Building openings should face the street, and the street interface should be consistent with the road interface, with the street interface serving as the

primary facade of the building.

Continuity of Building Scale: The scale of the building should be consistent with the surrounding arcade buildings. Considering that the building is located along the riverside, it needs to have a certain volumetric identity. The street width of the building should be at least 20m, and the height should be at least 21m.

（2）Building Morphology Design Guidelines

The building intervention guidelines primarily focus on enhancing the identity of colonnades in arcade buildings while ensuring the continuity of the arcade space.

Identity of Arcade Bottom Space: The bottom space of the arcade must maintain continuity to create a pleasant walking experience. The depth of the bottom space should be between 3-5m, and the external height of the arcade bottom space, considering the identity of the colonnades, should be at least 4m.

Identity of Local Volumetric Variation: Arcade buildings are encouraged to make formal changes in a local one or several spans while considering their impact on the overall building proportions.

Identity of Facade Division: Vertical divisions of the arcade facade should refer to the column spans of the ground floor, and the scale of the facade division lines should ensure their iconic appearance from afar.

Horizontal divisions of the facade can be appropriately elevated to unify the colonnade section with the upper floors, visually enhancing the proportion of the ground floor and reinforcing the identity of the colonnades.

Identity of Ground Floor Form: Arcade buildings often adopt different forms in the interface treatment of the ground floor, such as beam-pillar style, bracket-pillar style, continuous bracket style, Gothic style, etc. New arcade buildings can consider appropriate echoes with historical morphology while also responding to historical morphology in material and color.

Arcade buildings should also consider the impact of the roof on the skyline.

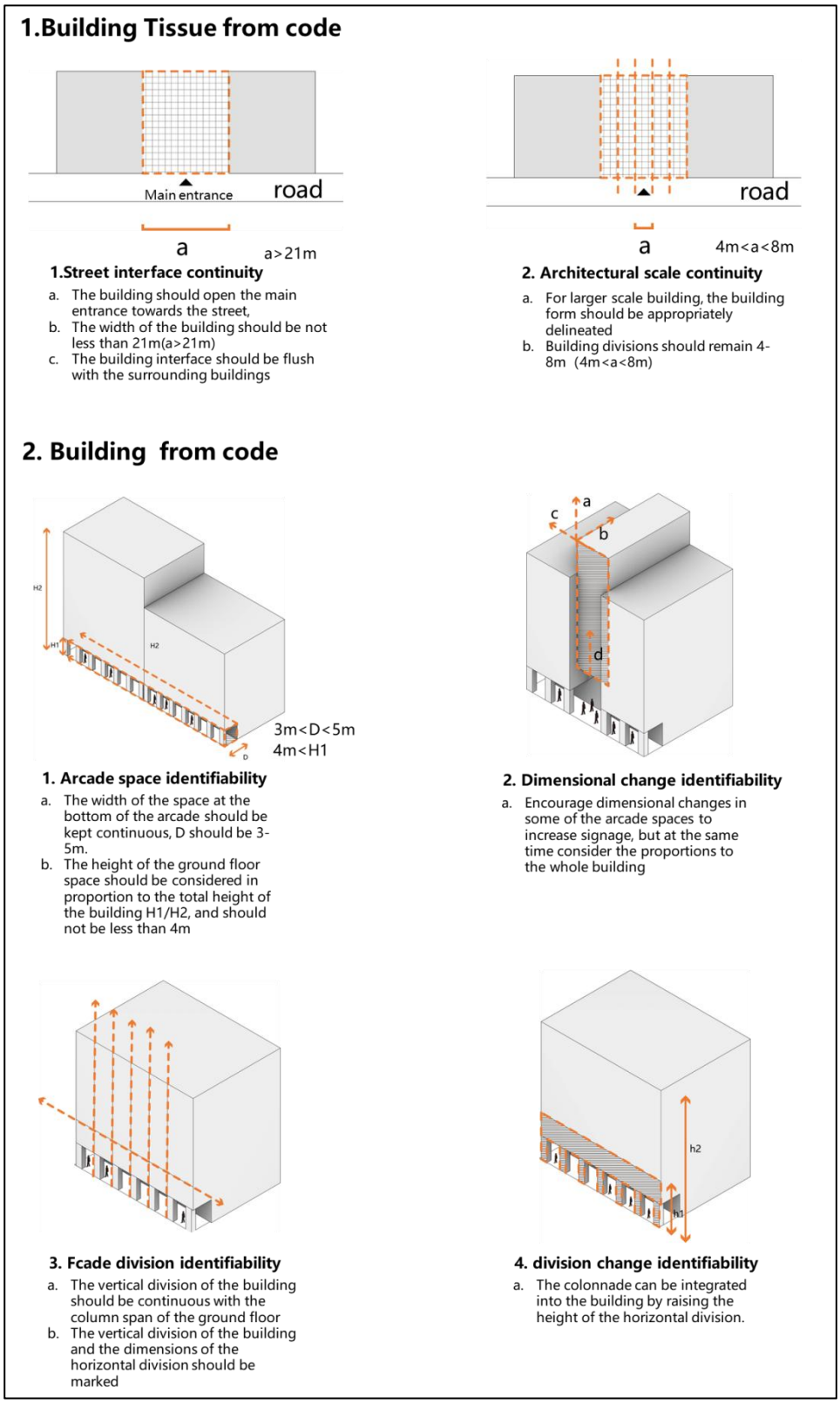
（3）Arcade Space Morphology Design Guidelines

Due to the generally higher height of the colonnaded arcade building spaces, to consider pedestrians' walking experience, the height-to-width ratio of their internal spaces should not

exceed 2:1.

Due to the differentiation of arcade building spaces, the ground floor space of the colonnaded arcade buildings does not require strong transparency. The proportion of colonnades to the overall space on the ground floor should be controlled to better showcase the arcade building colonnades.

Due to the functional differentiation of arcade building spaces, it is encouraged to design different arcade building spaces with varying degrees of shading to create variations in the facade form.



1.Street interface continuity

a. The building should open the main entrance towards the street,
b. The width of the building should be not less than 21m(a>21m)
c. The building interface should be flush with the surrounding buildings

2. Architectural scale continuity

a. For larger scale building, the building form should be appropriately delineated
b. Building divisions should remain 4-8m (4m<a<8m)

1. Arcade space identifiability

a. The width of the space at the bottom of the arcade should be kept continuous, D should be 3-5m.
b. The height of the ground floor space should be considered in proportion to the total height of the building H1/H2, and should not be less than 4m

2. Dimensional change identifiability

a. Encourage dimensional changes in some of the arcade spaces to increase signage, but at the same time consider the proportions to the whole building

3. Fcade division identifiability

a. The vertical division of the building should be continuous with the column span of the ground floor
b. The vertical division of the building and the dimensions of the horizontal division should be marked

4. division change identifiability

a. The colonnade can be integrated into the building by raising the height of the horizontal division.

Figure 6-5 Morphology design guidelines for T2d buildings tissue.

（Source：Illustrated by the author）

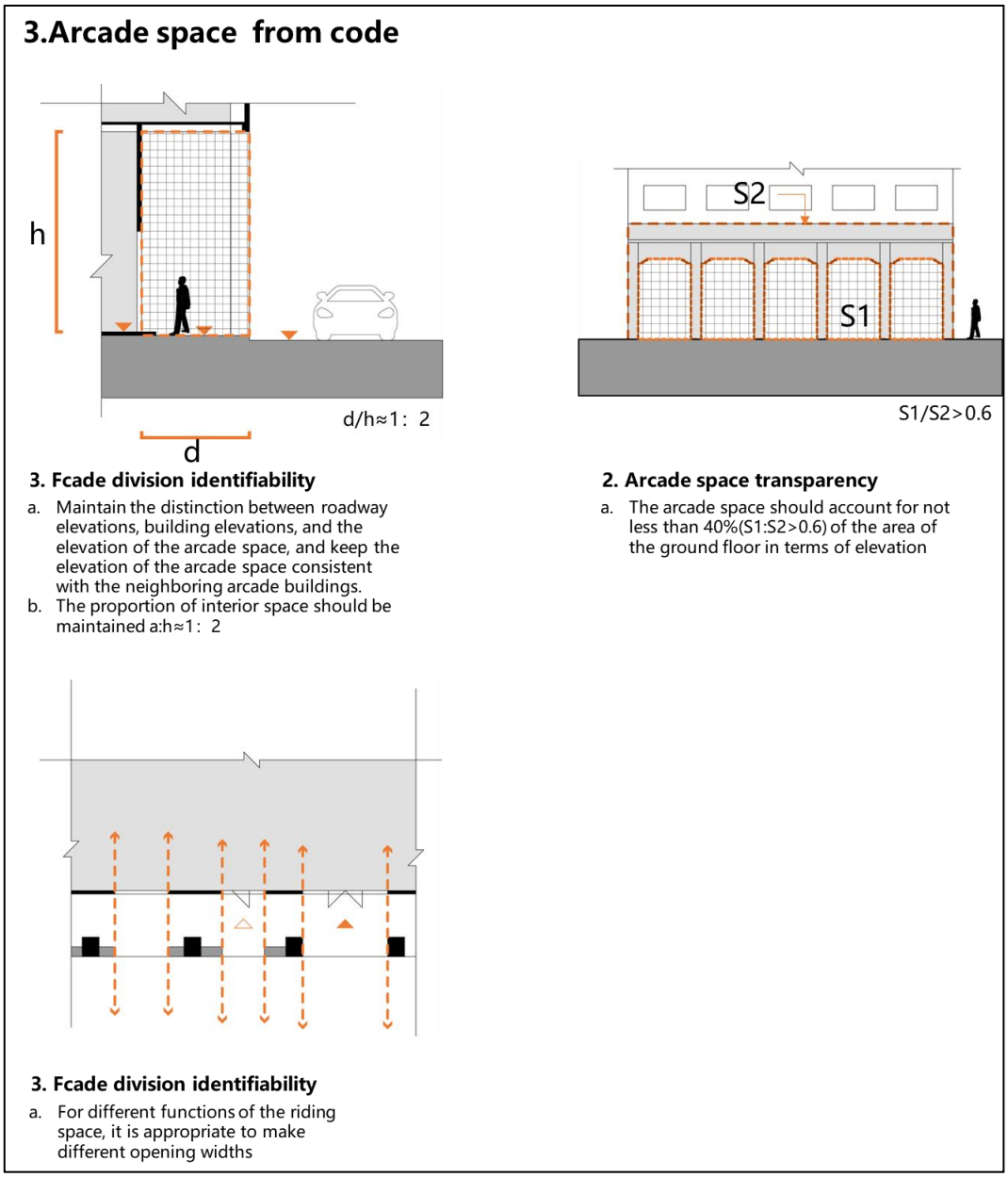


Figure 6-6 Morphology design guidelines for T2d buildings tissue.

（Source：Illustrated by the author）

6.1.2.Non-arcade Tissue Building Morphology Design Guidelines

Non-arcade building tissues can be mainly divided into two categories: one is the tissue with staggered setback, and the other is the completely independent tissue. Due to the differences in their characteristics from arcade building tissues, the continuity of interfaces and spatial continuity of arcade building tissues are not sustained. Therefore, the main design principles for these two types of tissues are to preserve the characteristics of arcade buildings in their morphology design as much as possible.

For the tissue with staggered setback.

Buildings still maintain relatively dense arrangement and continuous urban display interfaces. However, since the buildings are set back from the road to a certain distance, the continuity of arcade space cannot be maintained. The morphology design principles for this type of tissue should focus on preserving the original arcade building characteristics and establishing connections with arcade buildings in their morphology design.

（1）Buildings should strive to maintain visual continuity of arcade space.

（2）Buildings can consider adding shared public spaces to continue the cultural characteristics of arcade buildings.

For the completely independent tissue.

Its feature is that buildings are constructed on separate plots without a strong connection to surrounding buildings. Moreover, the buildings generally have larger volumes, leading to a further reduction in preserved arcade building characteristics. The morphology design principles for this type of tissue should aim to maintain coordination with surrounding buildings in their building form.

（1）Buildings should adopt treatment methods in building form consistent with the scale of surrounding arcade building tissues.

（2）Buildings can consider adding shared public spaces to continue the cultural characteristics of arcade buildings.

Figure 6-7 Typomorphology zoning map of the site's Modern building tissue.

（Source：Illustrated by the author）

T3a Tissue (Modern Setback Tissue) Building Morphology design Guidelines:

（1）Building Tissue Morphology Design Guidelines

For modern setback buildings, the morphology design guidelines for building tissues mainly focus on preserving their bamboo house characteristics, ensuring neatness along the street interface, and considering the building scale to be consistent with the surrounding arcade buildings.

（2）Building Morphology Design Guidelines

The guidelines for building morphology primarily consider adopting similar scales in the facade division as the surrounding arcade buildings. In the connection of arcade spaces, similar scale canopies are used, and different paving materials are employed to imply a

connection with the original arcade spaces.

（3）Building Morphology Design Guidelines

By setting up expanded porches, it is possible to respond to the existing arcade buildings in the vicinity. However, it is essential to control the scale of the porches, with a height-to-width ratio not exceeding 1.5:1.

Certainly, altering the paving material of the porches to match that of the arcade building spaces can create continuity in the pedestrian environment. This approach ensures a seamless walking experience and enhances the overall visual coherence of the street.

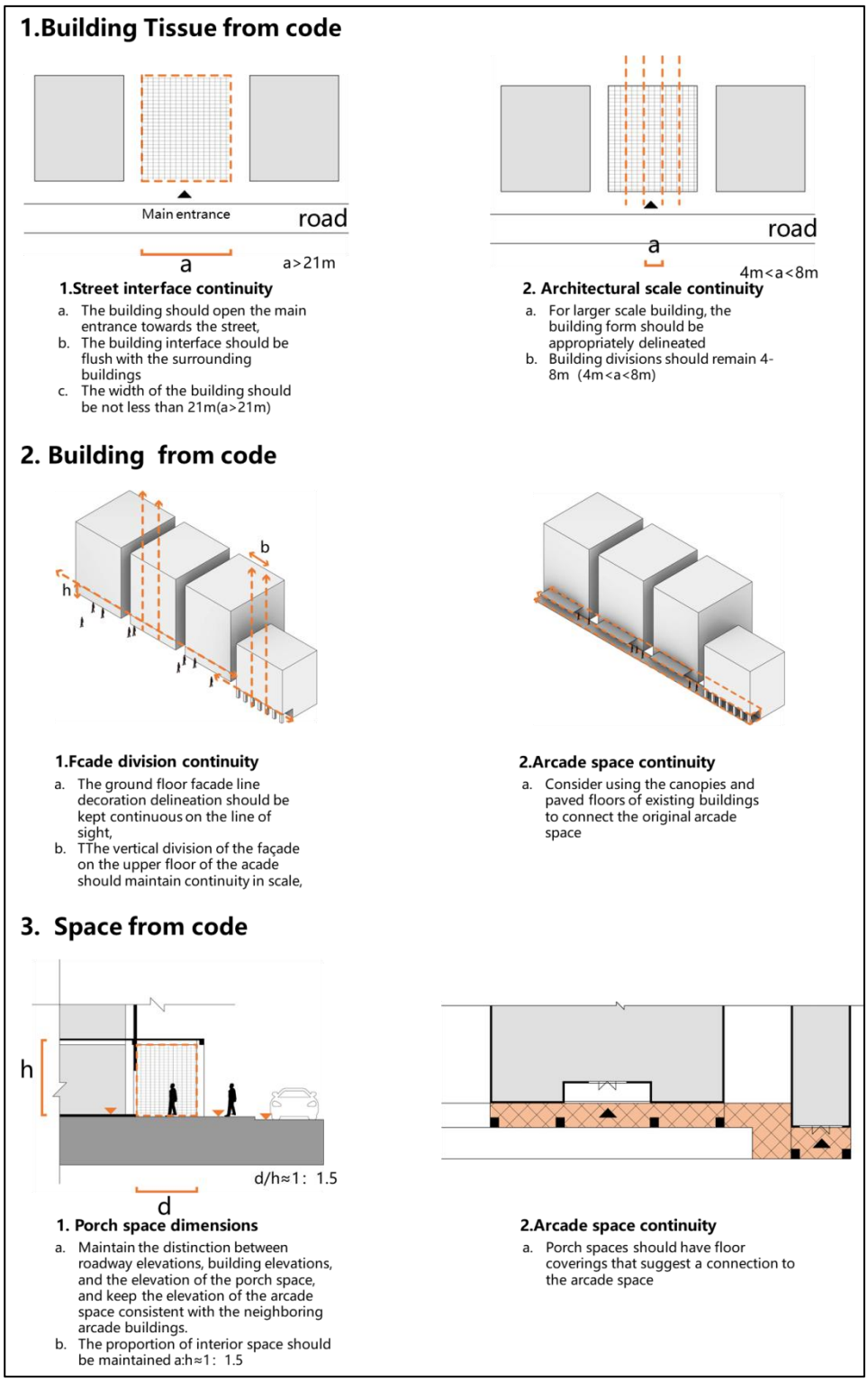


Figure 6-8 Morphology design guidelines for T3a buildings tissue.

（Source：Illustrated by the author）

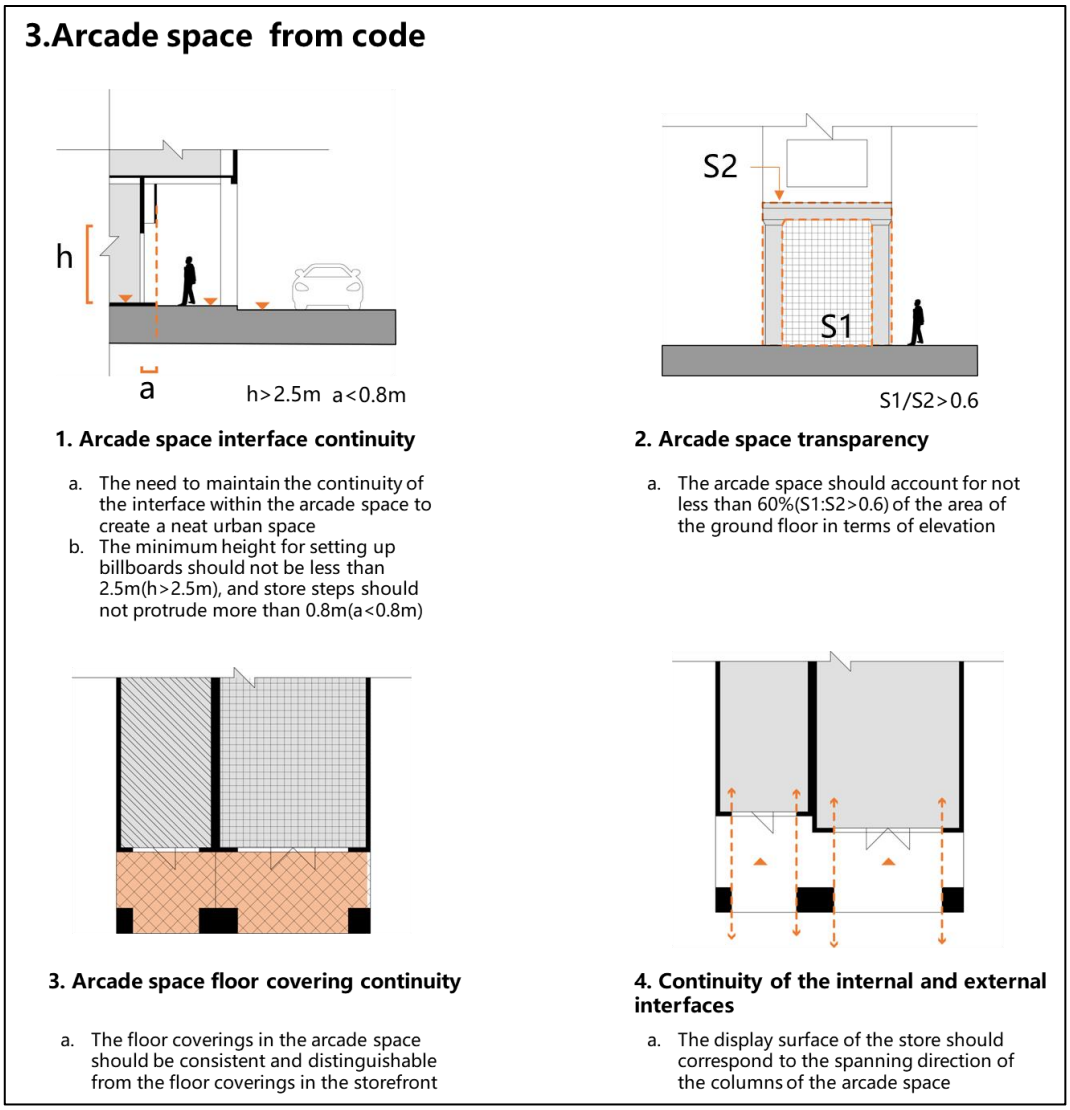


Figure 6-9 Morphology Design Guidelines for T3a Buildings Tissue.

（Source：Illustrated by the author）

T3b Tissue (Modern Independent tissue) Building Morphology Design Guidelines

（1）Building Tissue Morphology Design Guidelines

Building entrances and main facades should face the main roads, aligning with the surrounding buildings, and the building interfaces should strive to maintain a neat and continuous appearance.

（2）Building Morphology Design Guidelines

The ground floor of the building can adopt a colonnade form, maintaining a certain resemblance to the surrounding arcade buildings, while the division of the ground floor can be based on the surrounding arcade architecture.

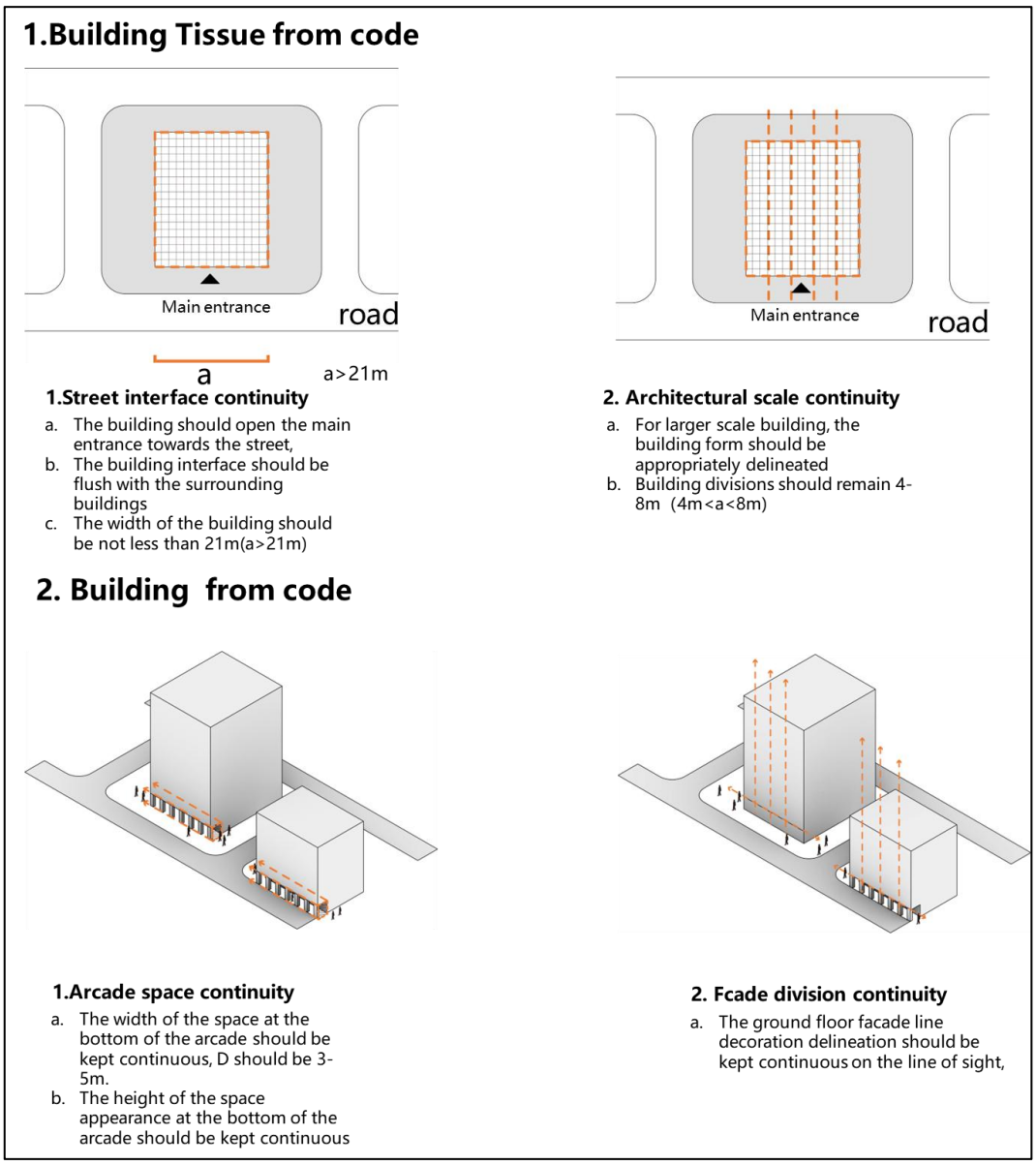


Figure 6-10 Morphology Design Guidelines for T3b Buildings Tissue.

（Source：Illustrated by the author）

6.2.Design Street Segment Selection Based on Building Tissue Characteristics

Based on the summarized characteristics of the arcade buildings, a morphological map of the Long Bund can be generated. From this map, typical sections of building tissues can be selected. Combining the morphology design principles and detailed morphology design guidelines from the previous section, the next phase of detailed urban morphology design can be conducted.

（1）**Street Segment 1** represents a typical single-row expanded arcade building tissue, mainly consisting of large-scale colonnade arcade buildings. The main street section type is along the river with urban display surfaces for the arcade street. The design objective is to transform the existing buildings in the section while preserving the characteristics of the colonnade arcade.

（2）**Street Segment 2** represents a typical double-row arcade building tissue, mainly comprising low-rise, small-scale corridor arcade buildings. The main street section type is an inner street with commercial functions for the arcade street. The design objective is to renovate the existing buildings in the section while preserving the characteristics of the corridor arcade.

（3）**Street Segment 3** is an area where modern and traditional building tissues intersect. The traditional bamboo house tissue of the arcade is interrupted by modern setback building tissues, resulting in non-uniform street sections. The design objective is to partially reconstruct the modern buildings in the section and repair the ruptured arcade spaces in terms of their morphology.

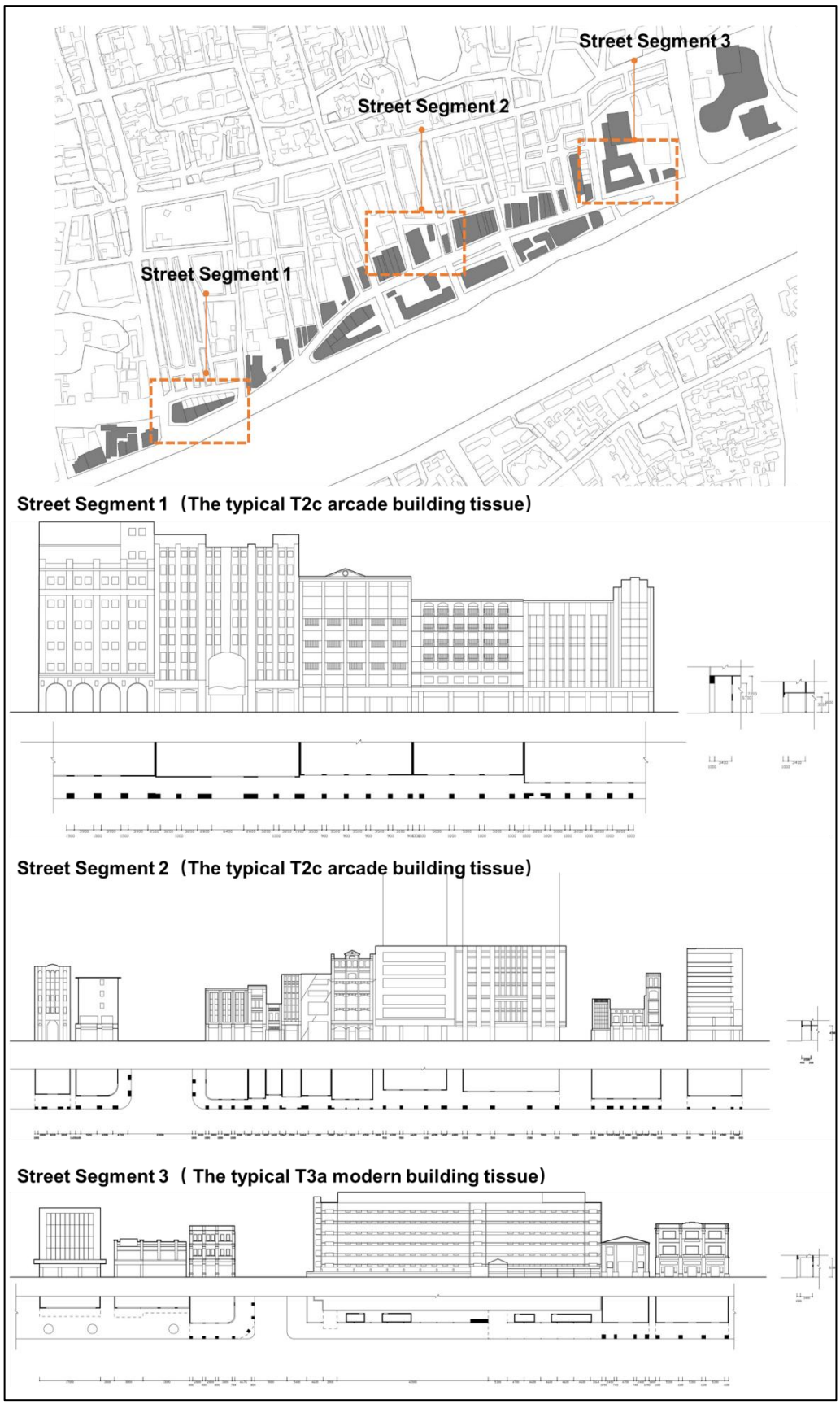


Figure 6-11 Maps of the Designed Street Segment' Locations.

（Source：Illustrated by the author）

6.3.Detailed Design of Street Segment 1

6.3.1.Overview of Street Segment 1

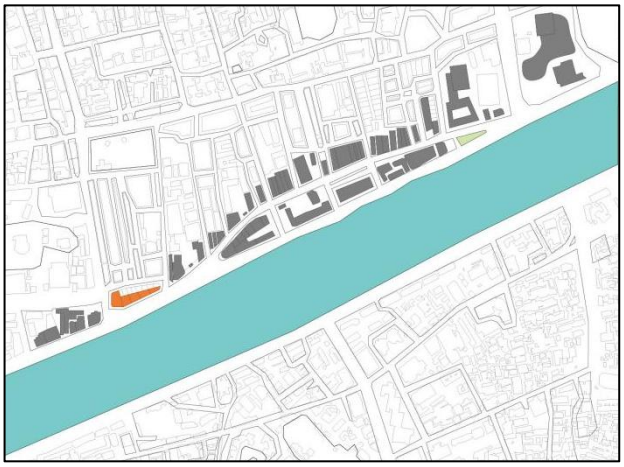


Figure 6-12 Street Segment 1 Location

（Source：Illustrated by the author）

This street segment faces the Pearl River to the south, offering excellent views, and is separated by a 20-meter wide urban arterial road. The segment features intact and continuous arcade spaces. On the western side of the street segment, there are historically significant buildings, such as the Jianan Hall East Wing, a key protected modern historical building designed by Yang Xizong, as well as the Datong Restaurant with building influences from the 1930s, inspired by the design of the Love Building. On the eastern side of the street segment, there are modern arcade buildings constructed with similar volumes and heights as the historical buildings, making it suitable as a demonstration street segment for interface renovation.

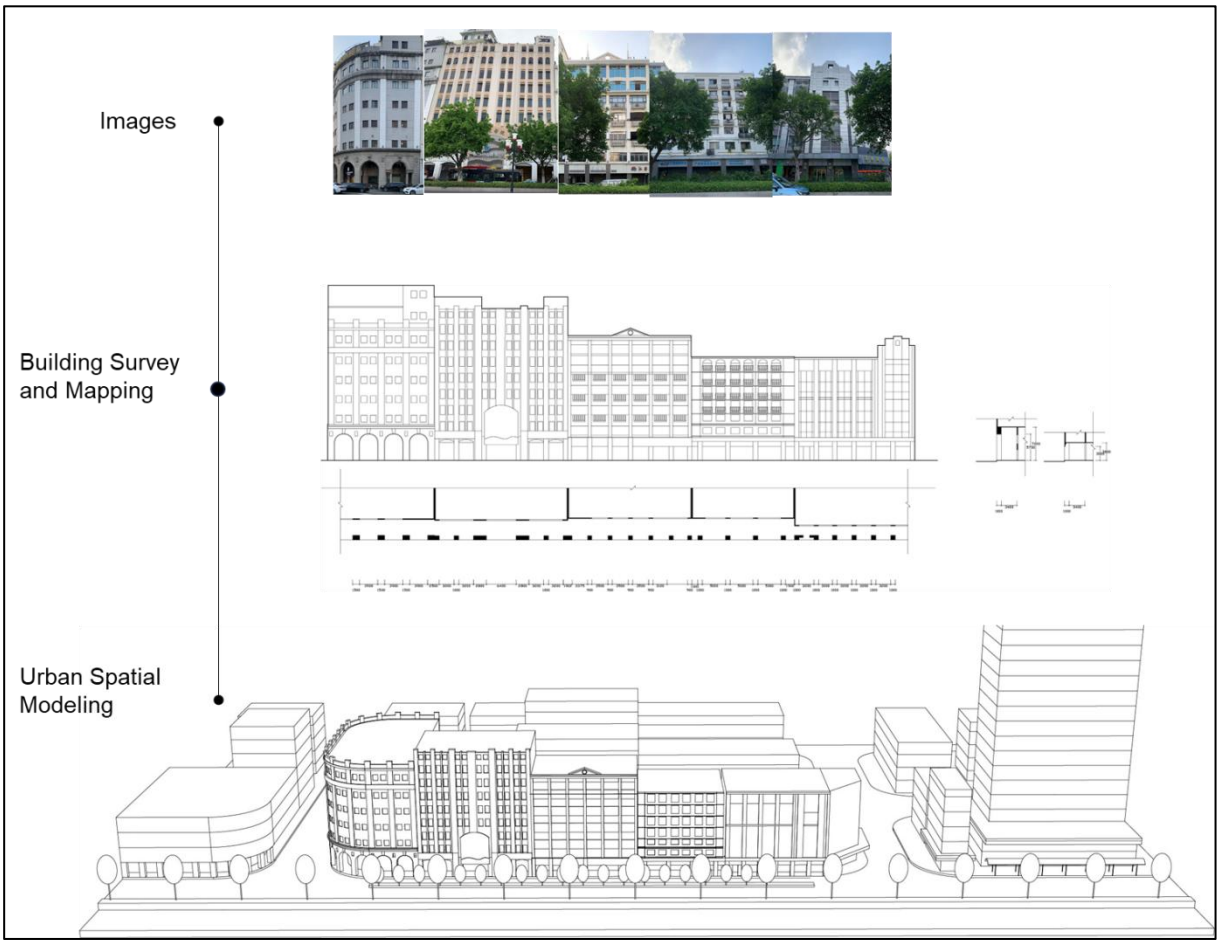


Figure 6-13 Street Segment 1 Site Information

（Source：Illustrated by the author）

6.3.2.Historic Arcade Buildings in Street Segment 1

Building morphology analysis of historical arcade buildings, namely the Southern Building of Jia Nan Tang and Datong Restaurant, located within this street segment, has been conducted.

Jia Nan Tang Southern Building:

Built in 1930, facing west with eight floors, this building features a reinforced concrete structure and its exterior walls are finished with water brush stone. The ground floor is designed as an arcade, composed of a series of Romanesque arches made of granite. Jia Nan Tang Southern Building stands as a representative example of the arcade-style buildings in modern Guangzhou.

From the analysis of its building form, we can draw the following conclusions:

(1) The Romanesque continuous arches on the ground floor can serve as a reference for preserving historical continuity.

(2) The elevation of the horizontal beltline to the second floor emphasizes the identity of the colonnade, which can be considered in the context of adjacent renovated arcade buildings.

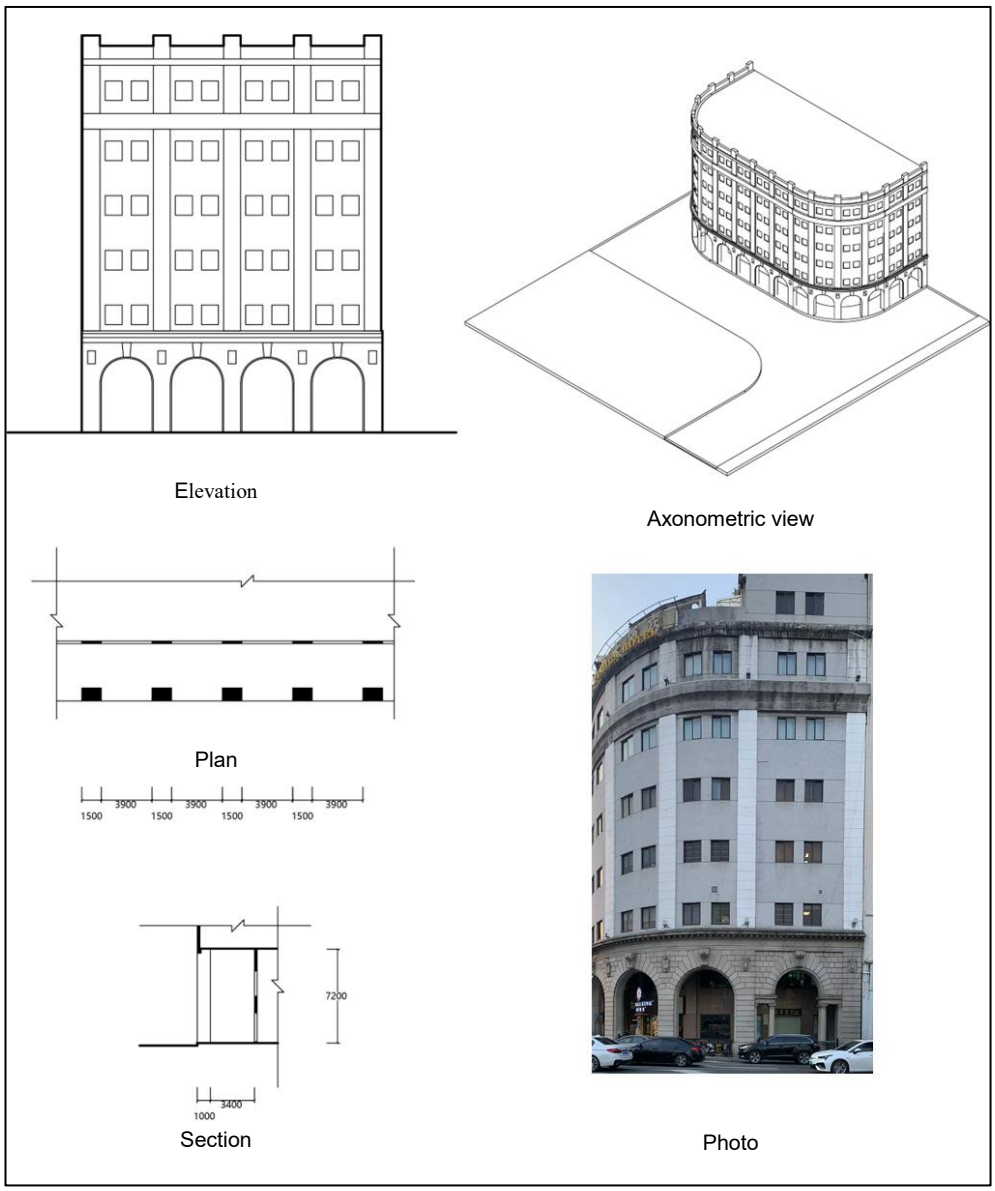


Figure 6-14 Jianan Hall Building Information

（Source：Illustrated by the author）

Datong Restaurant:

Located on Yanjiang West Road, Yuexiu District, Guangzhou, Guangdong Province, Datong Restaurant is one of the first batch of historical buildings in Guangzhou. Together with Datong Restaurant and Dasanyuan Restaurant, they are known as the "Three Greats."

Formerly known as Guangzhou Garden Restaurant.

From the analysis of its building form, we can draw the following conclusions:

(1) The height enlargement of its local entrance can serve as a reference for future renovation of building entrance height.

(2) The horizontal eaves and the height of the colonnade space can be used as a reference for adjacent arcade buildings.

(3) The building has prominent vertical divisions, and the width of its vertical facade divisions can be used as a reference for adjacent building's vertical division.

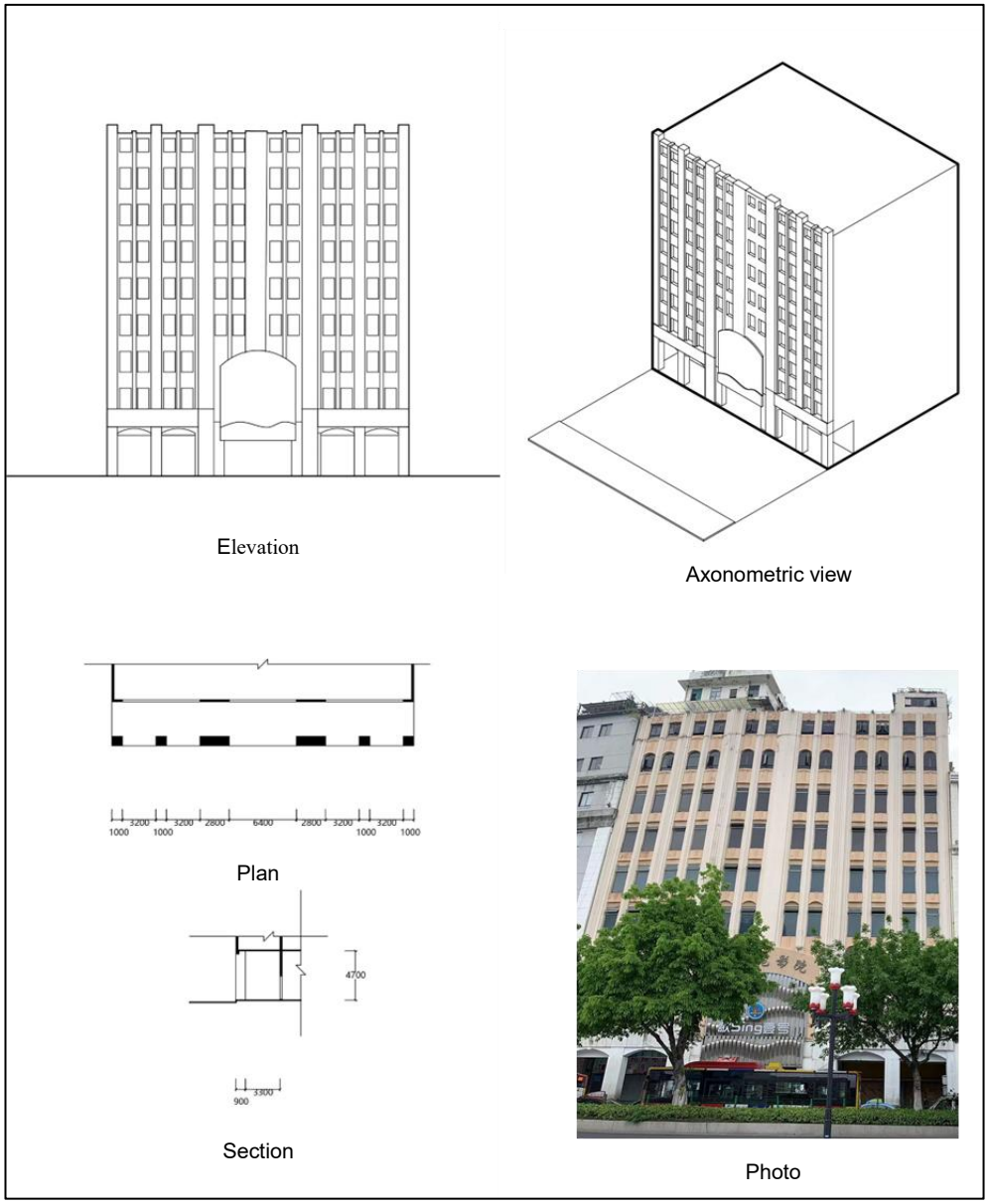


Figure 6-15 Datong Restaurant Building Information

（Source：Illustrated by the author）

6.3.3.Form Improvement Program for Arcade Street Segment 1

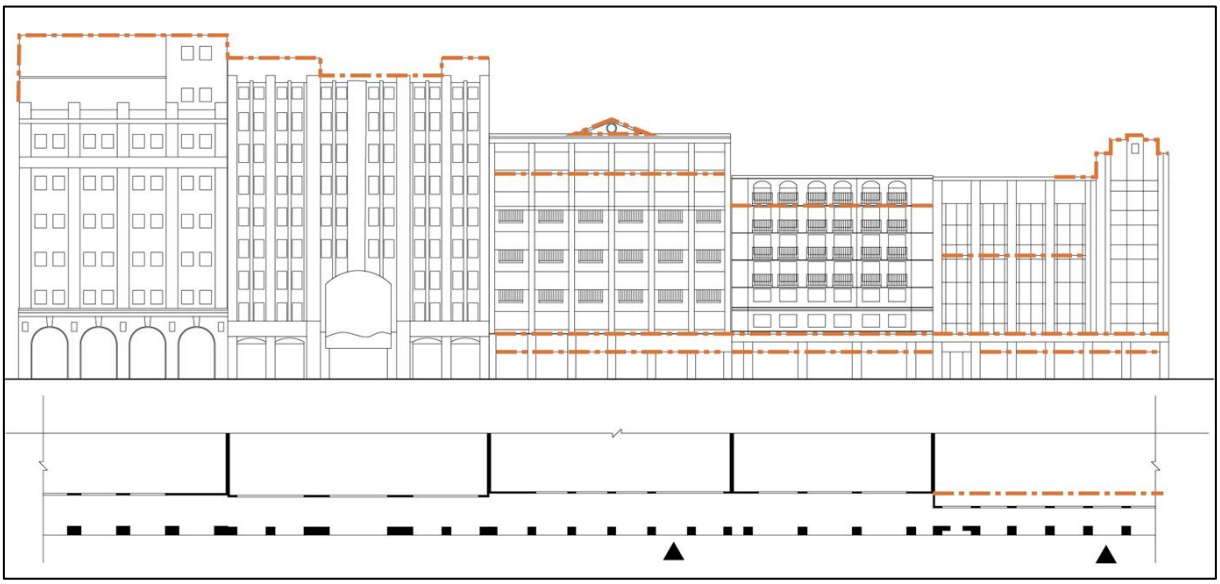


Figure 6-16 Morphological Analysis of the Street Segment 1

（Source：Illustrated by the author）

Street Segment 1 mainly consists of colonnade arcades, which differ from typical columnar arcades in certain identifying characteristics in terms of form. The factors contributing to this discrepancy are as follows:

(1) In terms of building form:

The addition of new structures has resulted in an inconsistent skyline for the entire arcade building, disrupting the overall division of the arcade's form. Moreover, the stylistic incongruity between the added portions and the original arcade architecture has affected the cohesive display of the building's overall form.

The overall architectural division lacks clarity and fails to consider the display characteristics of columnar arcades, overlooking the principles of aesthetic proportion in architectural division.

The overall architectural form lacks a holistic consideration of the ground-floor arcade space, neglecting to harmonize with different types of arcade spaces in architectural form.

(3) In terms of arcade space:

The signaling quality of the ground-floor arcade space is insufficient, evidenced by

inadequate height, and the lack of clear architectural division on the ground floor hinders the distinctiveness of the columnar arcade.

The ground-floor arcade space appears rigid and lacks variation, with minimal connection to historical arcade architecture forms. The uniform treatment of beam and column interfaces can be improved by introducing more variations.

The ground-floor arcade space lacks uniformity in the plan interface, affecting the fundamental accessibility of arcade space as a pedestrian thoroughfare.

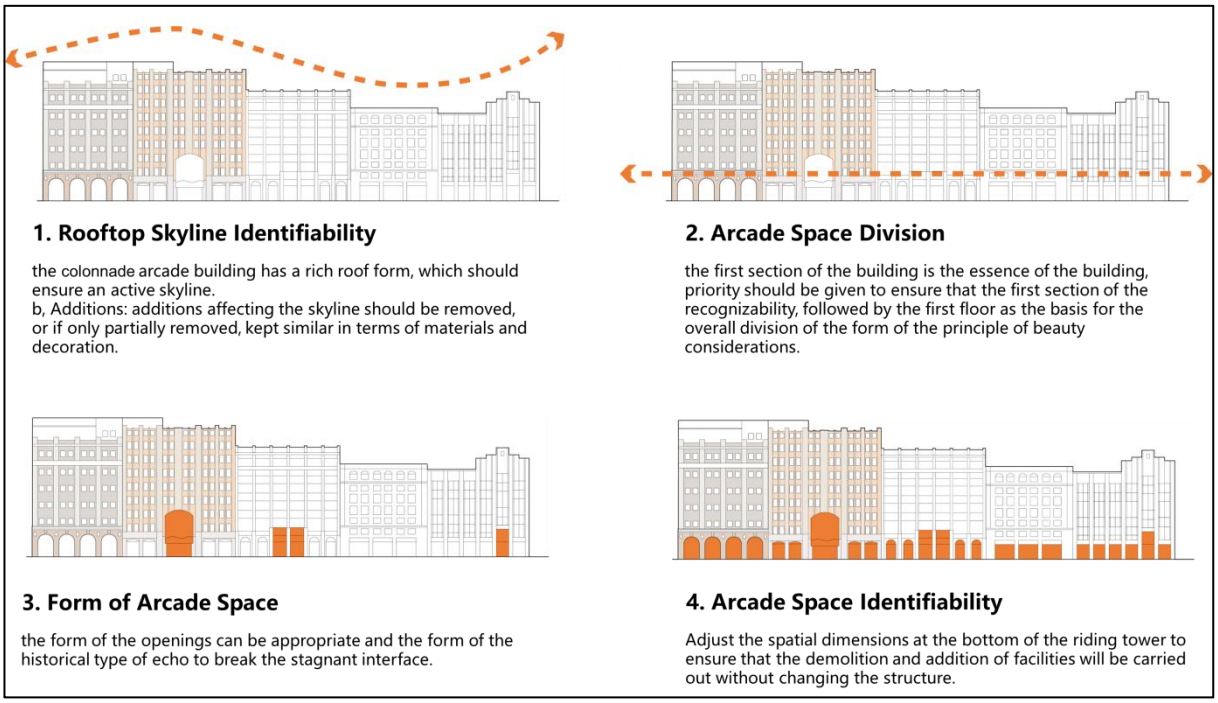


Figure 6-17 Form Design Strategies for Street Section 1

（Source：Illustrated by the author）

Corresponding to the design issues, the following morphological design strategies have been formulated:

（1） In terms of building form:

Emphasize the distinctive features of the building form in the skyline, showcasing its unique characteristics.

Pay attention to the division of the building form. By emphasizing the tripartite division of the building form, enhance the building's recognizability.

In the arcade space,

（2） In terms of arcade space:

Focus on the identity of the arcade space. Increase the external height of the ground floor space of the arcade and integrate the design of the second floor and ground floor spaces of the arcade to enhance the identity of the initial segment of the building.

Through the analysis of historical building forms, historical building morphological treatment techniques are applied to the morphological transformation of new buildings. This approach engages in a dialogue with historical forms and enhances the identity of the building's entrance space.

By magnifying specific sections of the arcade space, create a dynamic arcade space that reflects the functional diversity of columnar arcade spaces, showcasing the characteristics of the building type.

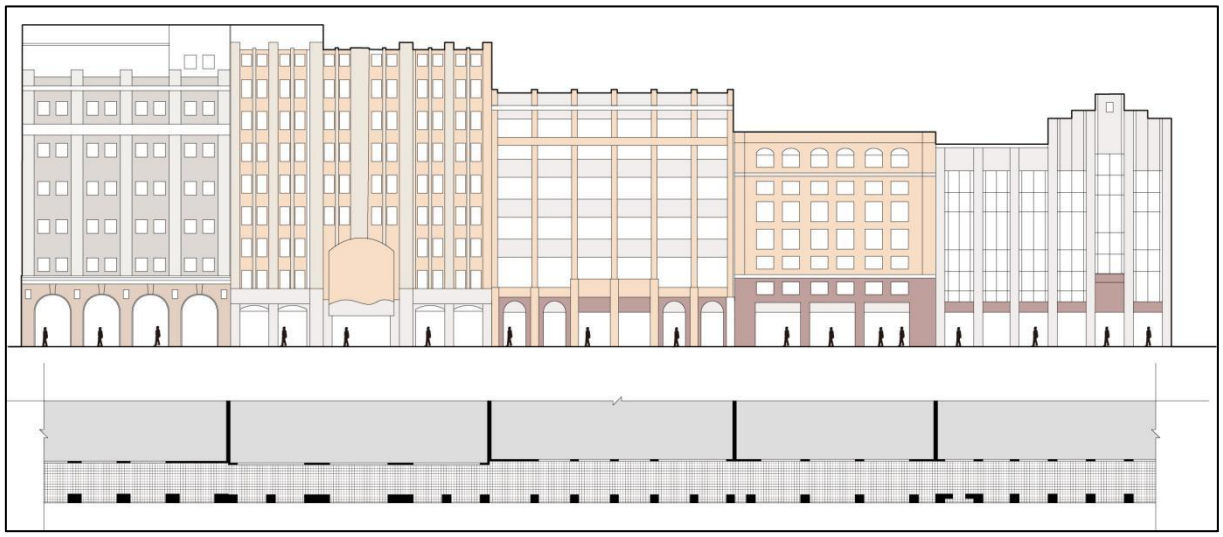


Figure 6-18 Morphological Design of the Street Segment 1

（Source：Illustrated by the author）

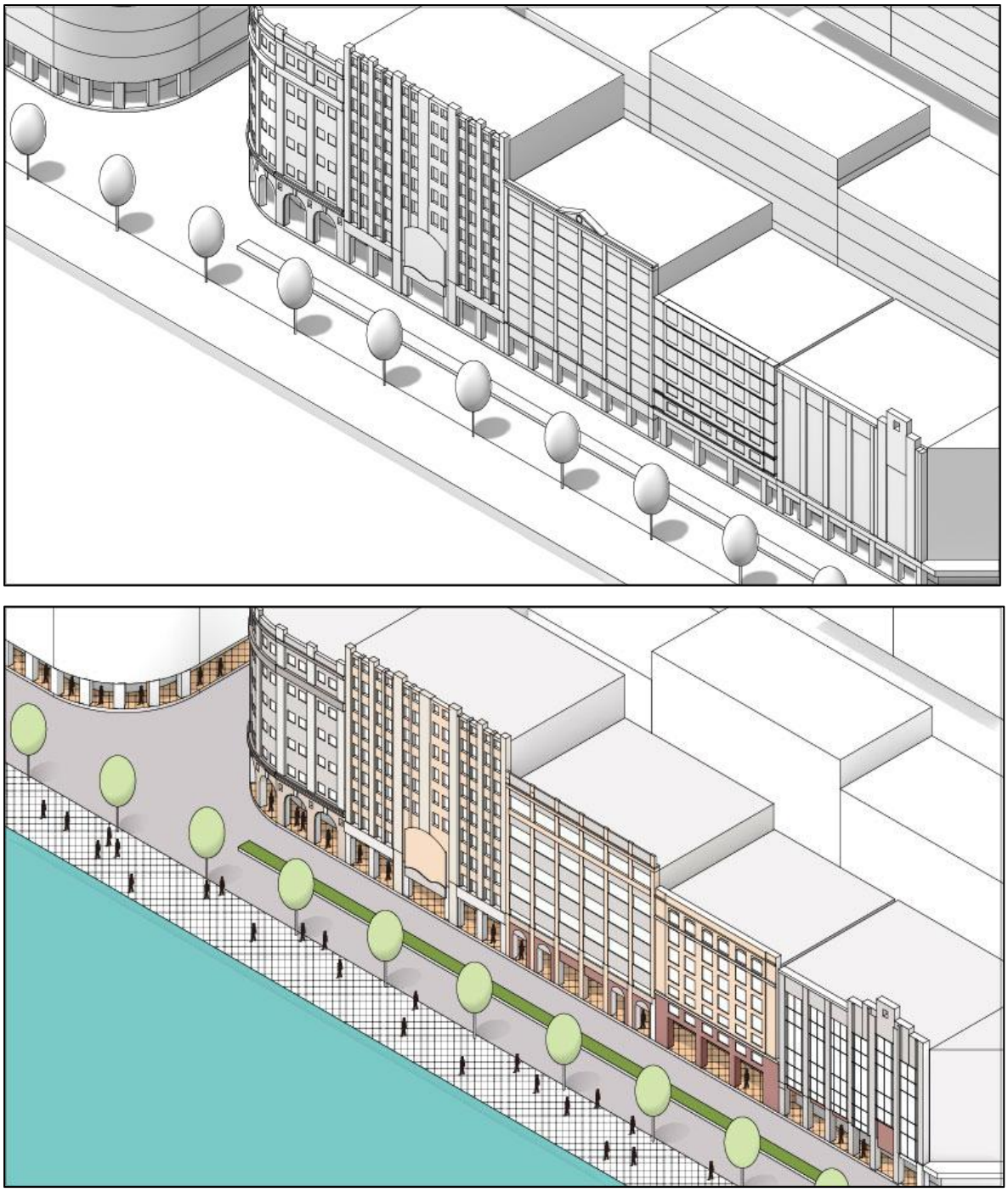


Figure 6-18 Comparison of Urban Morphology Design Before and after for Street Segment 1.

（Source：Illustrated by the author）

6.4.Detailed Design Street Segment 2

6.4.1.Overview of Street Segmen 2

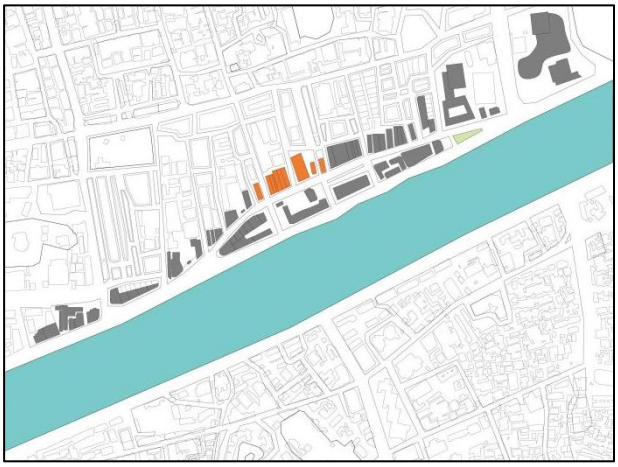


Figure 6-19 Street Segment 2 Location

（Source：Illustrated by the author）

This street segment is located within the Long Bund, with continuous arcade buildings on both sides. The road width is relatively narrow, and since the construction of the Haizhu New Embankment in 1930, it has become an internal road within the city.

The street segment currently contains several modern and republican-era arcade buildings, with ongoing updates to incorporate modern arcade architecture. As a result, the overall street appearance of the area presents a mix of various styles. Additionally, there are arcade buildings within the site that exhibit significant differences in scale compared to the surrounding architecture.

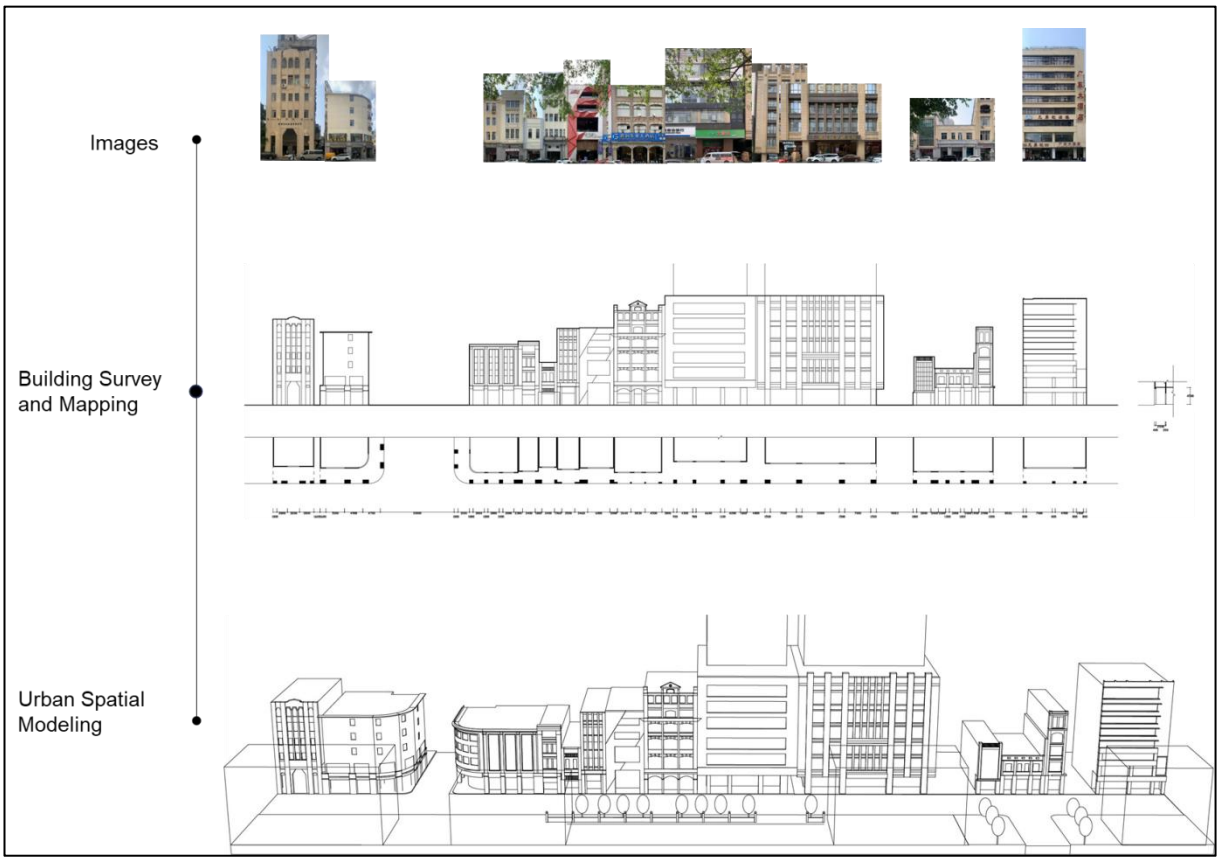


Figure 6-20 Street Segment 2 Site Information

（Source：Illustrated by the author）

6.4.2.Historic Arcade Buildings in Street Segment 2

The historical arcade building examples within this street segment are Tongfa Garment Factory, East Asia Hotel, and Washington Restaurant. Among them, the facade of the East Asia Hotel can provide reference for the vertical and horizontal division of interfaces, which is applicable to modern three-bay arcade buildings in the street segment. Washington Restaurant's distinctive treatment of its fourth floor can guide the handling of modern building floors within the street's sightlines. The approach used in Tongfa Garment Factory for handling independent volumes can serve as a reference for modern small-scale arcade buildings.

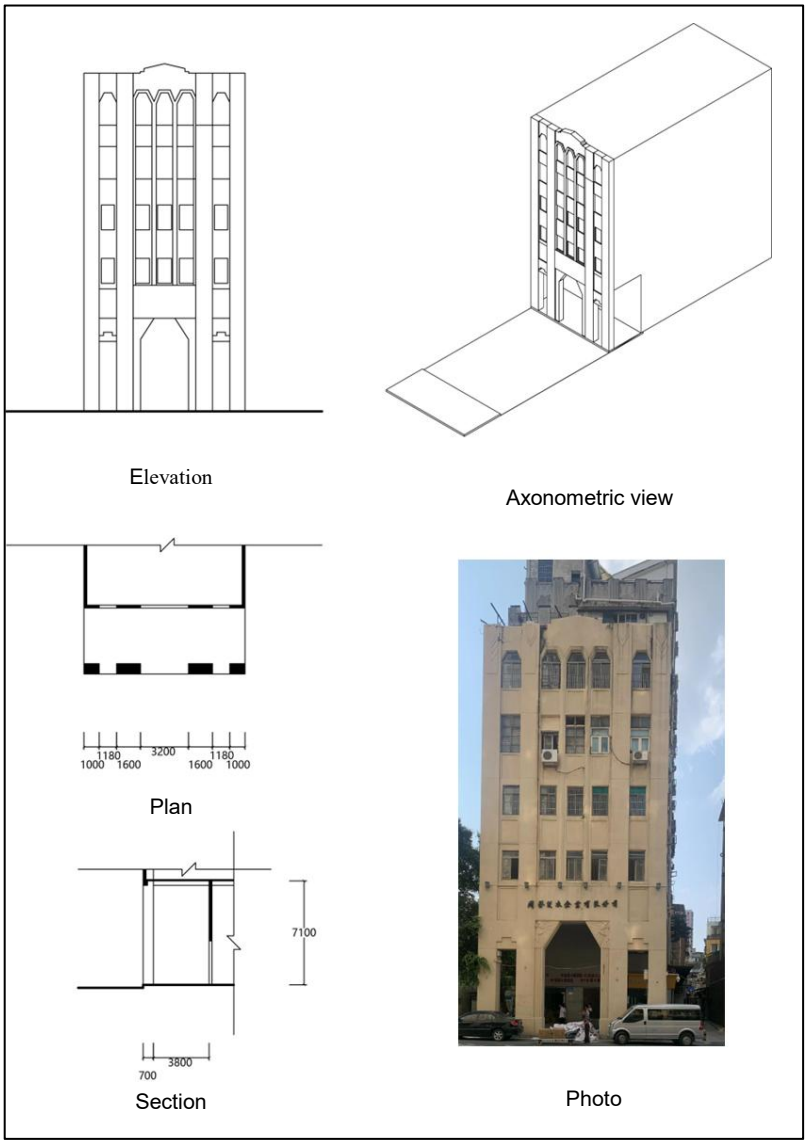


Figure 6-21 Tongfa Company Building Information

（Source：Illustrated by the author）

Tongfa Garment Company:

Tongfa Garment Company, located on the Long Bund in Guangzhou, is a well-known garment manufacturing factory and one of the historical relics in the area. Situated in Yuexiu District, Guangzhou, it used to be a significant representative of the textile industry in the city. The facade of the building is adorned with simple decorations.

From the morphological analysis, the locally enlarged height of its low-level space can serve as a reference for similar modifications in the form of arcade buildings.

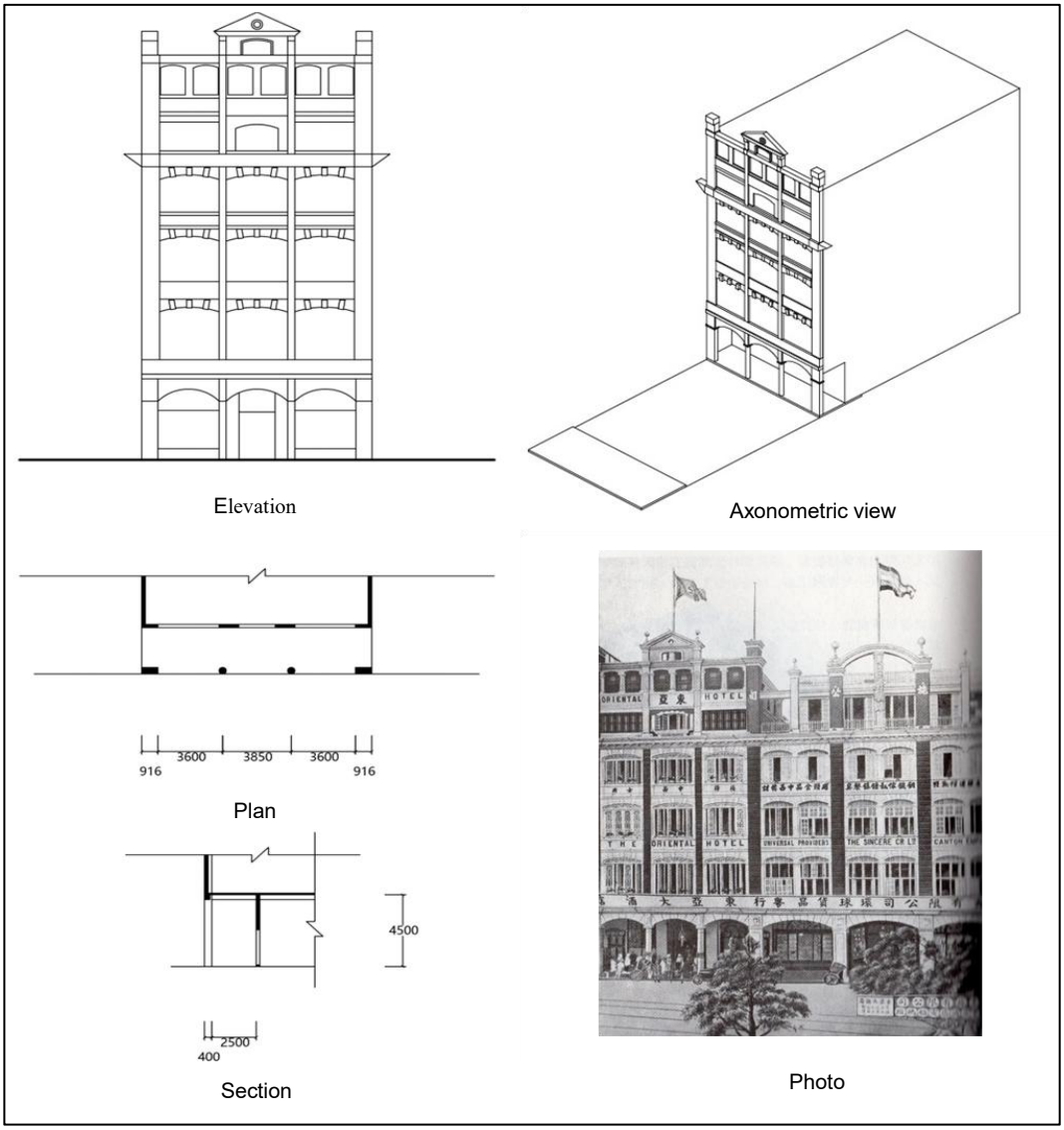


Figure 6-22 East Asia Hotel Building Information

（Source：Illustrated by the author）

Dongya Hotel:

Dongya Hotel is a historically significant hotel in Guangzhou, one of the well-established hotels in the city, and a cultural and historical heritage of Guangzhou. Established in 1923, Dongya Hotel is one of the earliest commercial hotels in modern Guangzhou history. From the morphological analysis.

（1）the horizontal eave and the height of the low-level space of the building can serve as a reference for the spatial continuity of the surrounding arcade buildings.

（2）The vertical division of the building can be used as a width reference for the future vertical division lines of the modified arcade buildings.

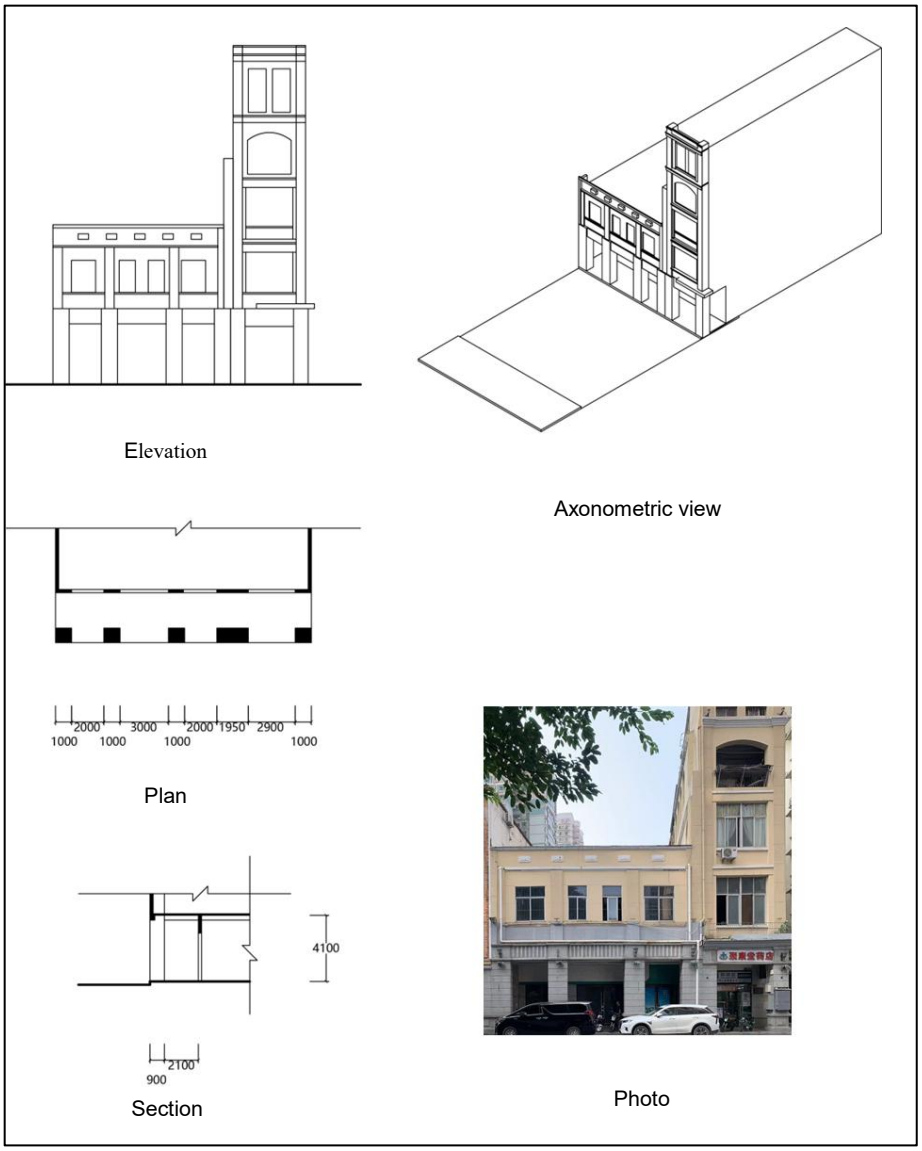


Figure 6-23 Washington Western Restaurant Building Information

（Source：Illustrated by the author）

Washington Western Restaurant:

The Washington Western Restaurant, located on Guangzhou's the Long Bund Main Road, is a well-known Western-style restaurant situated on a bustling street in Yuexiu District, Guangzhou.

In terms of morphology, it can serve as a reference for the surrounding buildings in the following aspects:

Its building height, based on actual research, has a favorable display aspect with its four-story height. This height can be used as a reference for controlling the height of new arcade buildings, as well as for height division considerations to enhance the continuity of the

arcade street architecture.

6.4.3.Form Improvement Program for Arcade Street Segment 2

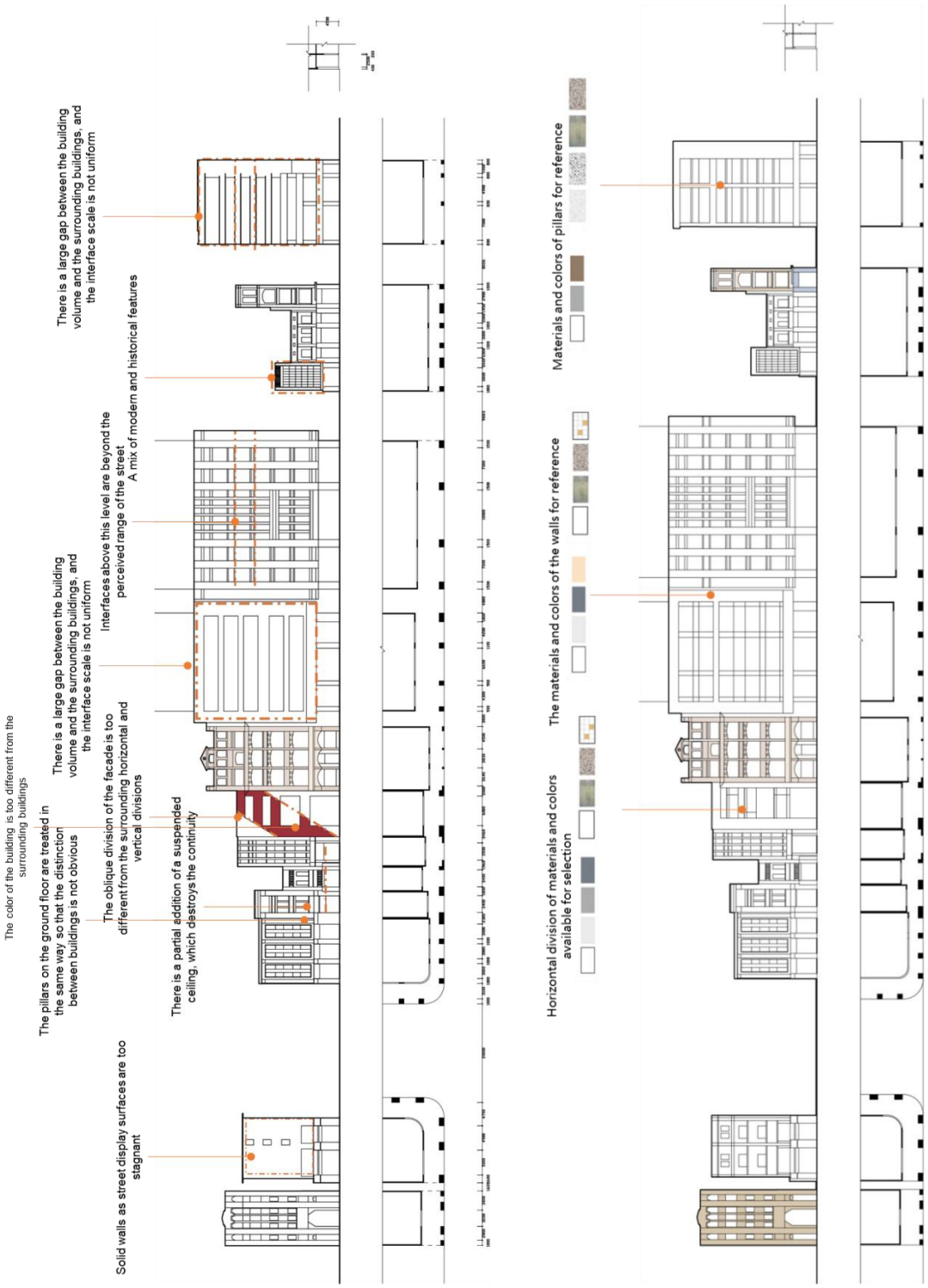


Figure 6-24 Morphological Design of the Street Segment 2

（Source：Illustrated by the author）

The building types in Street Segment 2 mainly consist of covered corridor-style arcade. Factors that deviate from the identifying characteristics of colonnade-style arcades in terms of form are as follows:

（1） In terms of building tissue morphology:

Due to the presence of large-scale buildings on the site, their tissue is not in harmony with the traditional historical arcade buildings on the site, disrupting the continuous characteristics of the arcade tissue.

The presence of buildings with heights significantly exceeding those of surrounding structures disrupts the vertical continuity of the street's building morphology.

（2） In terms of building morphology:

Limited building morphology design has been applied to the street-facing interfaces of the buildings on the site, resulting in a monotonous appearance, which undermines the continuous characteristics of the arcade's building interfaces.

The horizontal division of buildings on the site does not align with the typical characteristics of the ground floor arcade spaces, resulting in a lack of vertical continuity in the functional division of the arcade buildings.

Some buildings on the site adopt diagonal divisions, which do not align with the horizontal functional divisions and vertical pillar spans typical of traditional arcades, disrupting the continuity of the arcade's morphology division.

（3）In terms of arcade spaces:

There are inconsistencies in the height of the exterior interfaces of the ground floor arcade spaces on the site, disrupting the horizontal continuity of the arcade spaces.

Additionally, some arcade spaces on the site have excessively low exterior interface heights, reducing the transparency of the arcade spaces and deviating from the characteristics of covered corridor-style arcades.

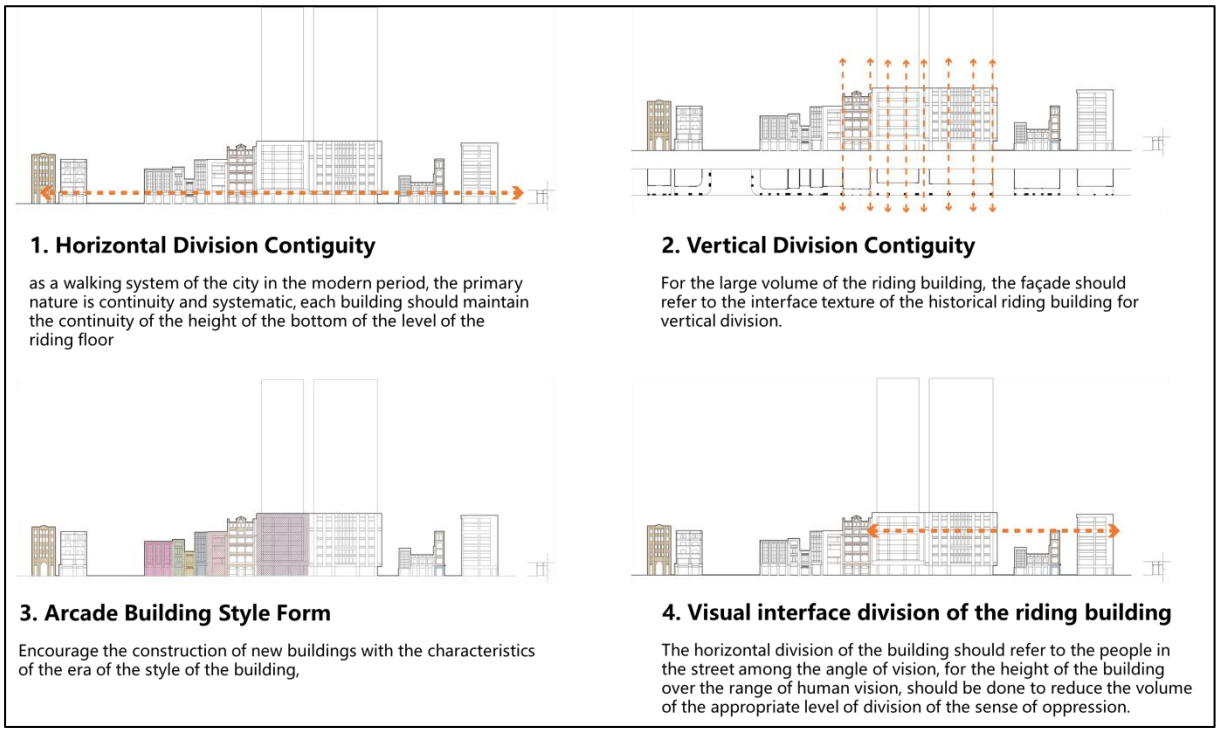


Figure 6-25 morphology Design Strategies for Street Segment 2

（Source：Illustrated by the author）

For Arcade Street Segment 2, the following morphological design strategies are proposed:

（1）In terms of building tissue morphology:

Add vertical divisions to the large-scale buildings to visually reduce their volume and harmonize them with the overall arcade division of the street.

For excessively tall buildings, introduce horizontal divisions at their fourth floors to reduce their impact on the overall building morphology of the arcade street. Enhance the vertical continuity of the arcade buildings by introducing horizontal divisions.

（2）In terms of building morphology:

Emphasize the stylistic diversity between different arcades, showcasing individuality while maintaining the overall continuity of the arcade street's architecture. Highlight the design of the arcade interfaces facing the street to ensure their continuous appearance.

（3）In terms of arcade spaces:

Emphasize the division of the ground floor interfaces of the arcades to enhance the continuity of functional divisions and reflect the continuous characteristics of the urban transportation system.

Enhance the transparency of the arcade spaces, emphasizing the display of commercial spaces within the arcade.

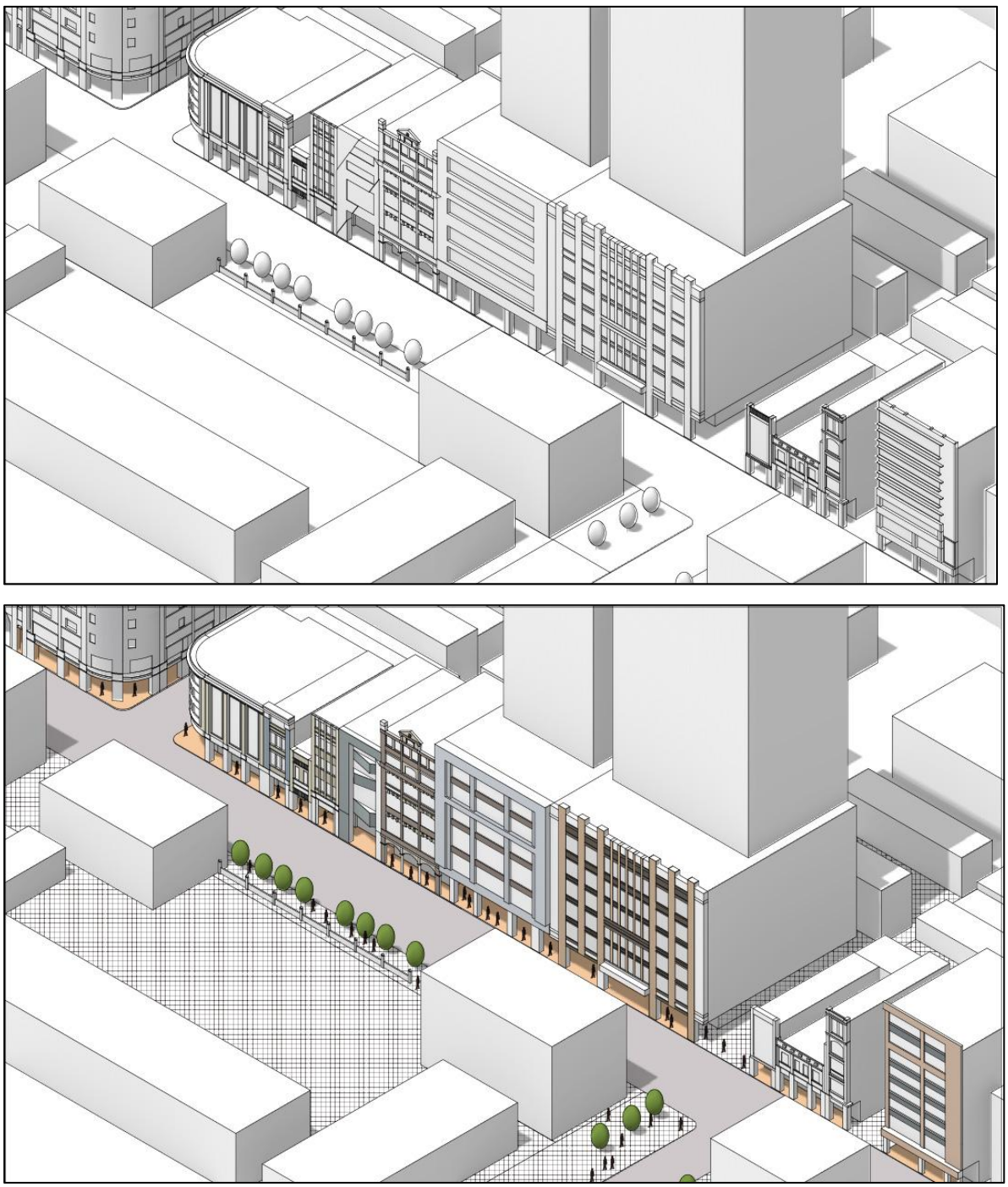


Figure 6-26 Comparison of urban morphology Design Before and after for Street Segment 2.

（Source：Illustrated by the author）

6.5.Detailed Design Street Section 3

6.5.1.Overview of Street Segment 3

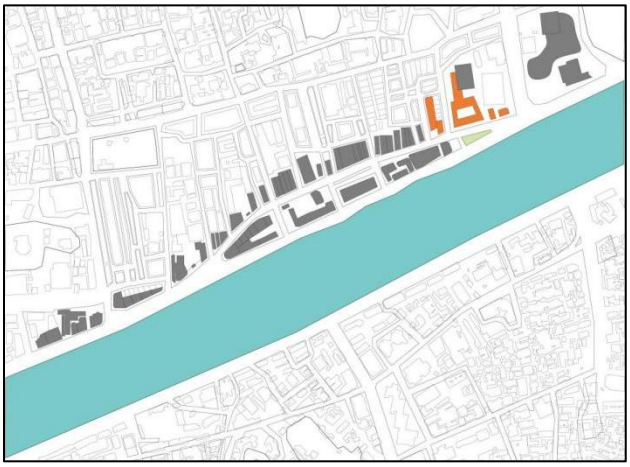


Figure 6-27 Street Segment 3 Location

（Source：Illustrated by the author）

This street segment is located on the east side of the Long Bund and serves as the entrance to the east-side arcade street of the Long Bund. There is a triangular square on the east side, which has a good effect in gathering people and showcasing buildings. The buildings on the far east are two historic arcade buildings, but their arcade interface tissue is interrupted by a large-scale Guangzhou Medical University Affiliated Hospital.

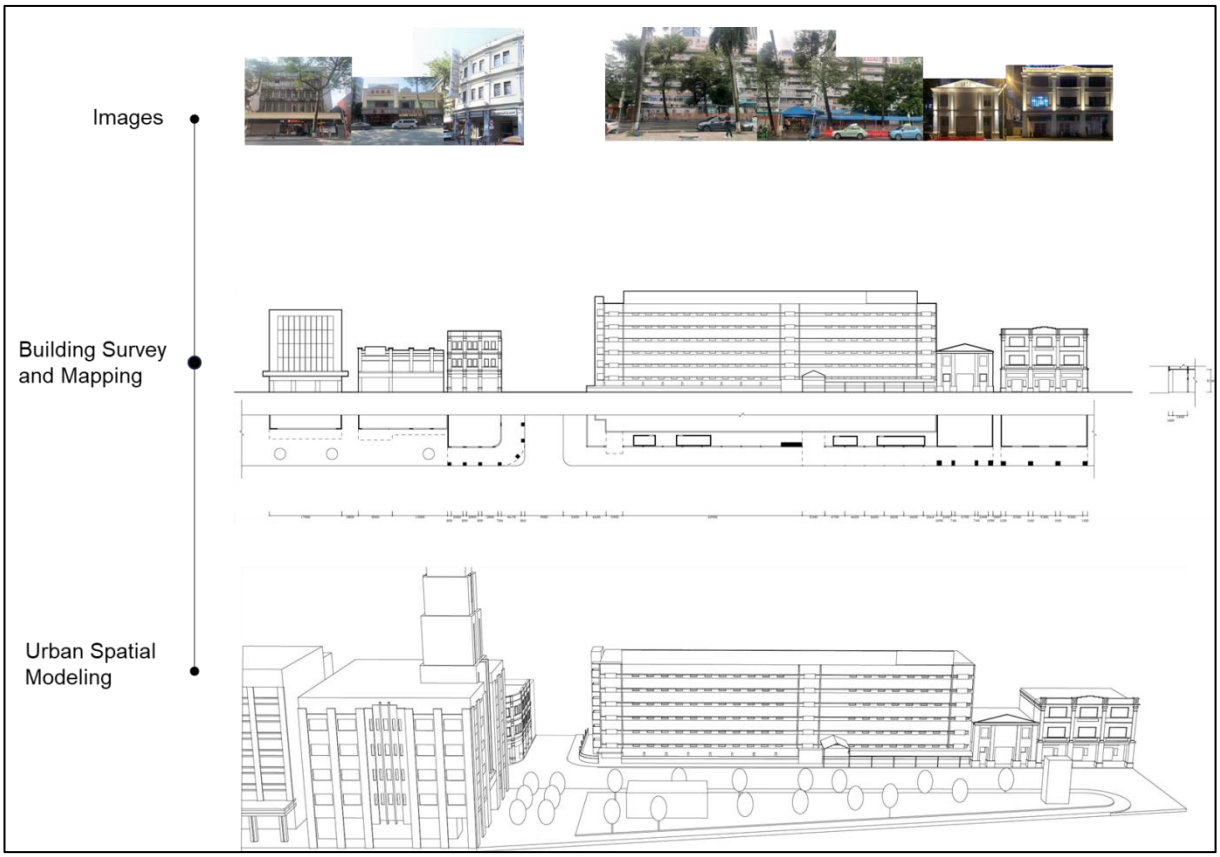


Figure 6-28 Street Segment 3 Site Inmorphologyation

（Source：Illustrated by the author）

6.5.2.Historic Arcade Buildings in Street Segment 3

The arcade buildings in the site's street segment mainly include Zhongfa Pharmacy and Zhongyuan Transport Company. As for modern buildings that can serve as references, there is the National Respiratory Center. Zhongfa Pharmacy and Zhongyuan Transport Company can provide references for the horizontal facade division height in the modern building's morphology transmorphologyation within the site. Their size can offer guidance for the vertical division of newly constructed buildings. The National Respiratory Center can provide insights into the spatial morphology for the renovation of existing buildings within the site. The handling of the ground-level space with porches and arcades as public areas can establish a connection with the existing arcade buildings in terms of spatial and facade division.

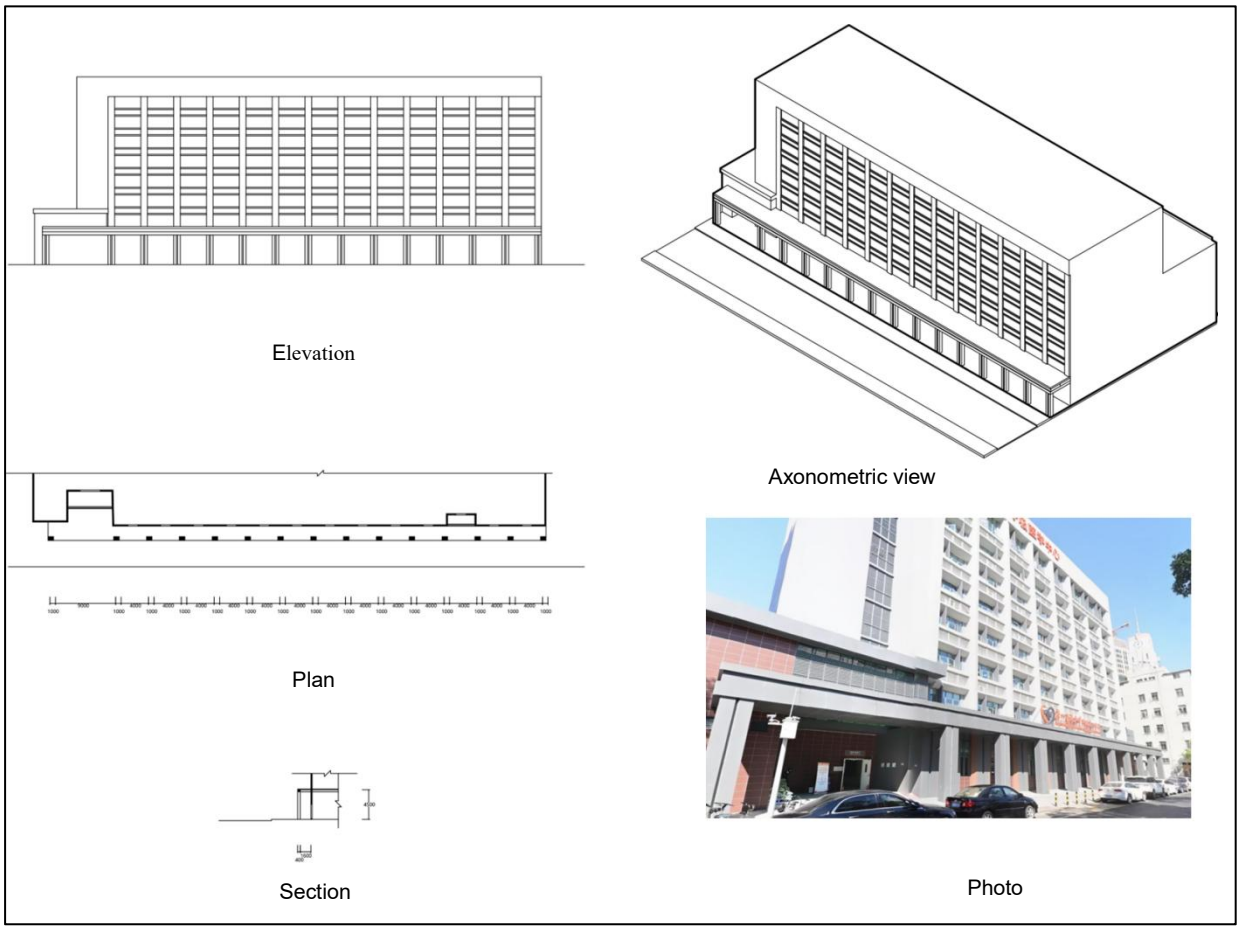


Figure 6-29 the National Respiratory Hospital Building Information

（Source：Illustrated by the author）

National Respiratory Hospital:

The National Respiratory Hospital is a medical building reconstructed in 2019 next to Yongan Hall on the Long Bund. It has two main characteristics in its morphology:

(1) The height of the ground-level arcade space remains consistent with the adjacent arcade buildings. Additionally, the building's added external corridors not only serve a decorative purpose but also ensure spatial continuity with the arcade spaces.

(2) Its vertical and horizontal facade divisions take reference from the scale of the surrounding arcade buildings, providing a certain continuity in the facade's morphology with the neighboring arcade structures.

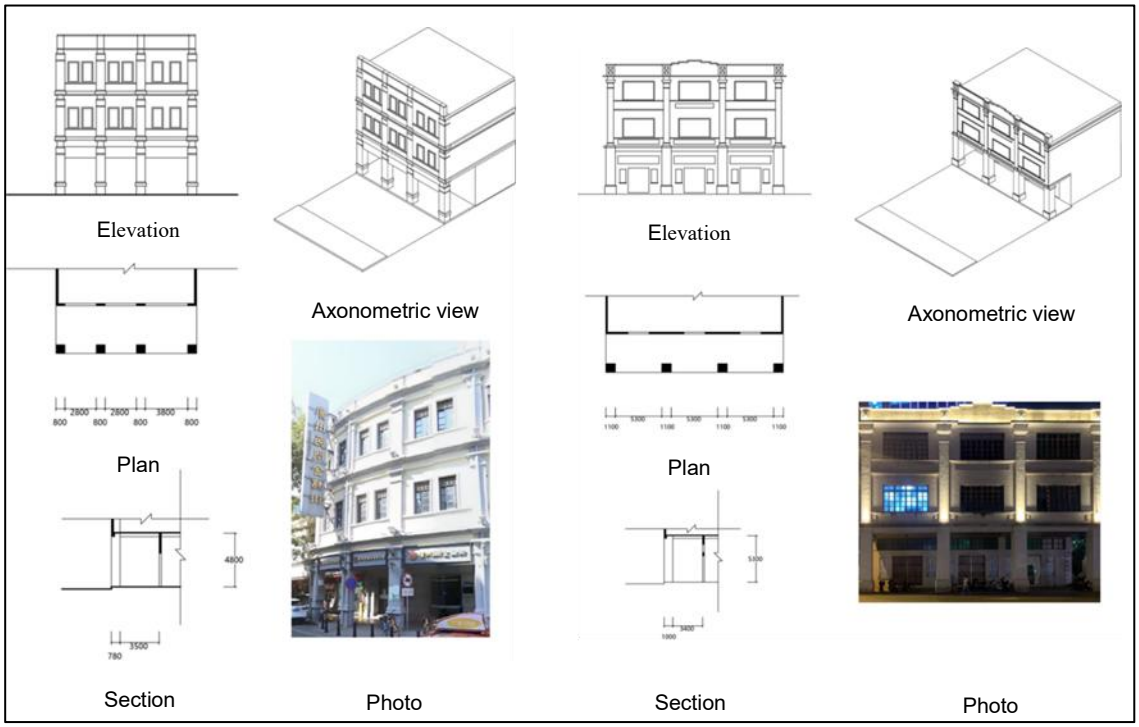


Figure 6-30 the Zhongfa Pharmacy and Zhongyuan Transport Company Buildings Information

（Source：Illustrated by the author）

Both of the above buildings are historical arcade structures, and they provide two points of morphology references for the modern building transformation:

(1) The height and division of the ground-level arcade can serve as a basis for the division of the ground-level arcade in the transformed buildings.

(2) The vertical facade divisions can be used as a reference for the vertical division of modern arcade buildings.

6.5.3.morphology Improvement Program for Arcade Street Segment 3

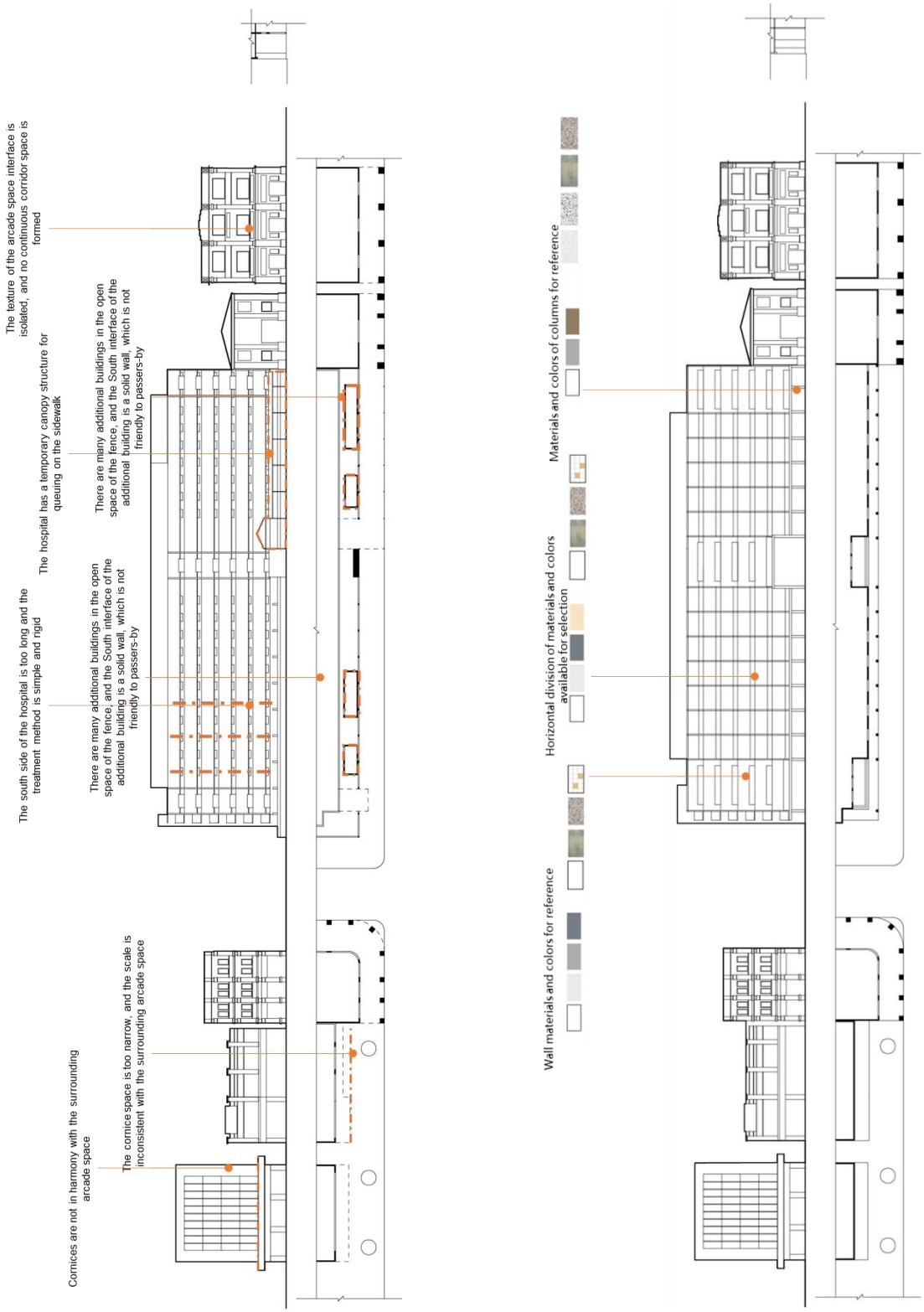


Figure 6-31 Morphological Design of the Street Segment 3

（Source：Illustrated by the author）

The main urban morphological issues in Street Section 3 are as follows:

（1）In terms of building tissue morphology:

The traditional arcade tissue within the site is interrupted by the modern large-scale setback tissue, and the continuous tissue characteristics of adjacent arcades are not preserved.

（2）In terms of building morphology:

Due to the absence of arcade-style colonnades in the modern buildings on the site, the continuity of the arcade's ground floor colonnade space is disrupted.

The modern buildings on the site have significant differences in vertical division compared to the surrounding arcade buildings, resulting in a lack of harmony in their volume relative to the surrounding arcade spaces.

（3）In terms of arcade spaces:

The presence of added canopy structures on the buildings connects them partially to the surrounding arcade buildings. However, due to significant visual disparities between the canopy structures and the surroundings, the connection is not visually harmonious.

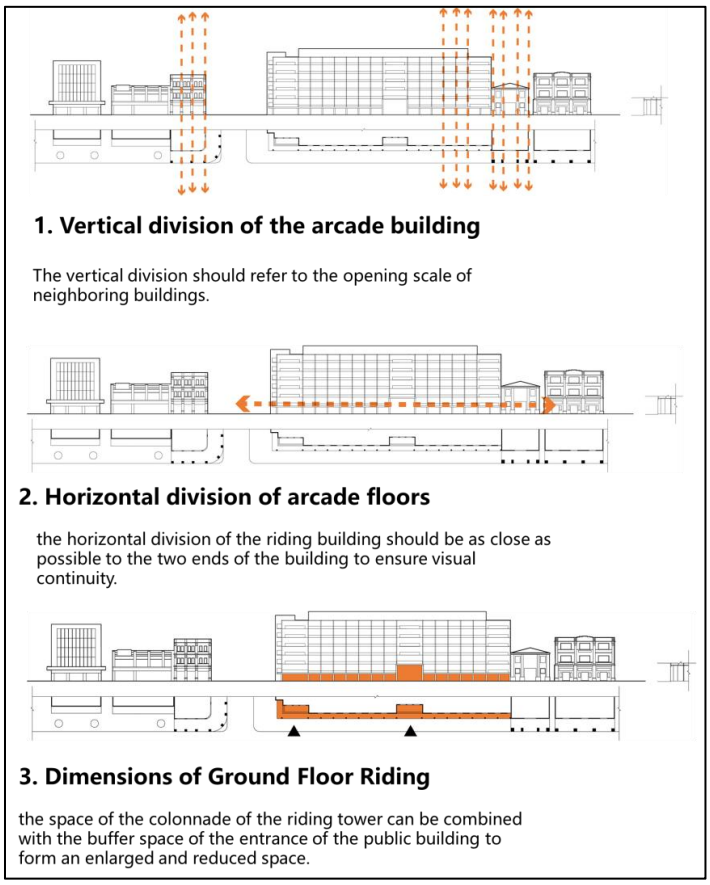


Figure 6-32 Form Design Strategies for Street Segment 3

（Source：Illustrated by the author）

The main building tissues in Street Section 3 consist of modern setback tissues and arcade tissues. In this section, the main feature is the interruption of arcade building tissue by modern elements. The morphological design strategies for Street Section 3 are as follows:

（1）In terms of building tissue morphology:

Divide the large-scale buildings to visually reduce their volume and maintain consistency in volume scale with the surrounding arcade buildings.

（2）In terms of building morphology:

Revise the colonnade spaces to establish continuity with the surrounding arcades, creating a continuous public space.

Adjust the height of the colonnade spaces to match the ground floor height of the surrounding arcade buildings, ensuring visual continuity in arcade morphology.

（3）In terms of arcade spaces:

Design flooring similar to the surrounding arcades to imply continuity in arcade spaces and create a continuous arcade environment.

Control the column spans of the colonnades to match those of the surrounding arcades, forming a continuous arcade colonnade interface.

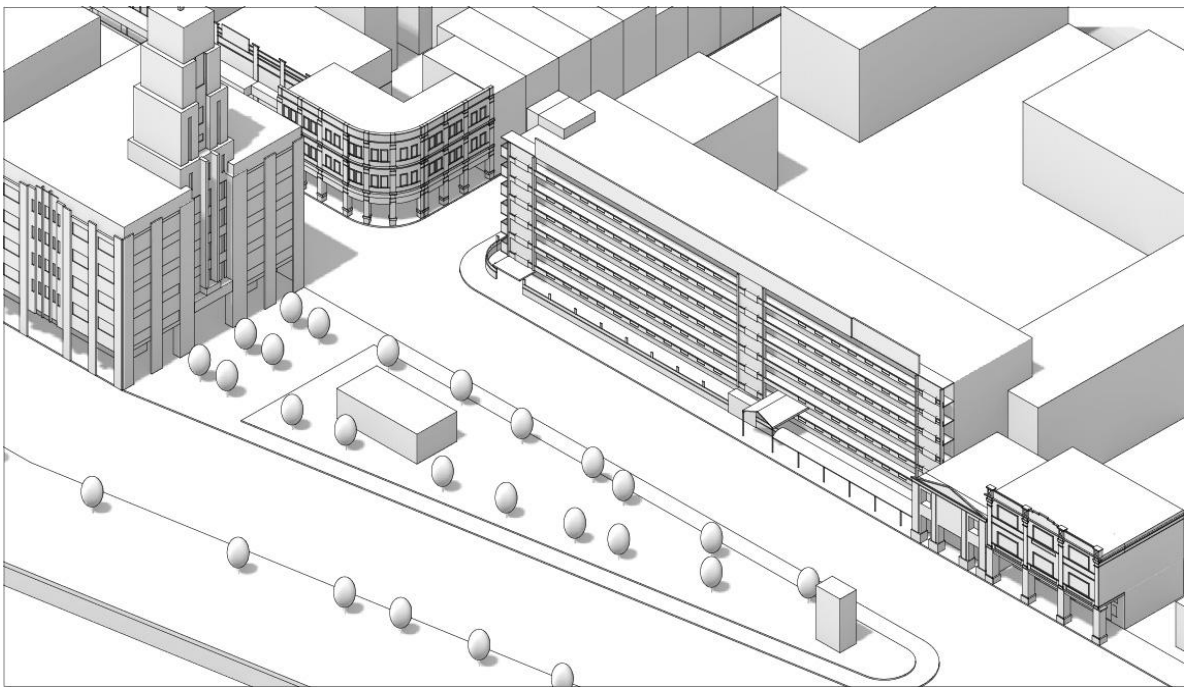


Figure 6-33 Comparison of Urban Morphology Design before and after for Street Segment 3.

（Source：Illustrated by the author）

6.6.Summary of This Chapter

In this chapter, based on the characteristics summarized in the previous chapter, the buildings within the site have been divided into morphological regions, and specific morphological control guidelines have been developed for each region, considering the identified arcade building features.

The guidelines are divided into two parts. The first part outlines the fundamental principles that buildings should possess, while the second part provides detailed morphological control guidelines. These guidelines are established from three different scales to engage in a dialogue with traditional morphological elements.

The latter part of this chapter focuses on design practice. Using the morphological region map, representative segments with distinct tissues are selected. With reference to the morphological control guidelines, architectural form designs are created for these three segments, aiming to retain the original morphological characteristics of each street segment.

At the end of this chapter, we can get the result of the final urban form design by comparing the effect diagrams, and the urban form design through the typomorphology has

been harmonized and echoed with the historical buildings better.

Conclusions

Research Summary

Through theoretical research on typomorphology analysis and case studies, this thesis combines the application background of the theory and the constraints of the actual site to summarize a set of working frameworks for typomorphology analysis and application suitable for studying the site. It analyzes and summarizes the existing arcade buildings within the site and forms morphological control guidelines specifically for the arcade buildings along the Long Bund.The conclusions are as follows:

（1）The potential of typomorphology method application

typomorphology, rooted in the Western social and historical context, deeply studies urban history through city maps, understands the evolution of urban elements over time, and provides advice and references in an operational manner for new urban constructions and urban historical preservation. The use of precise urban plans and urban morphological maps in typomorphology analysis provides a guarantee for its application. Based on the analysis of time and the summary of features, it offers a reference basis for the application of typomorphology. typomorphology is a rational method for analyzing urban morphology, and its operational analysis and research process can be a reference for the protection of many historical cities in China.

（2）The theoretical significance of arcade buildings

There have been many domestic analyses and research on arcade buildings, which have deeply analyzed arcade buildings from the perspective of urban systems and building styles. typomorphology, based on the perspective of urban form, further explores the urban characteristics of arcade buildings, deepening the understanding of arcade buildings.

In the application of morphological typology to the analysis of the riding building should pay attention to the analysis of the factors behind the changes in the spatial form of the riding building, the commercial factors analyzed in the text is only one aspect, through the discovery of the factors behind, just as Caniggia's summary of the privatization tendency behind the Roman residential buildings, so that we can make adaptive modifications and designs to the

further revitalization of the riding building by linking to the present-day context.

（3）The practical significance of typomorphology in the protection of arcade buildings along the Long Bund

Through the application of typomorphology, a set of morphological preservation guidelines can be provided for the protection of arcade buildings along the Long Bund. It can also provide a morphological design guideline for future building updates on the Long Bund. By analyzing the typomorphology and summarizing the morphological characteristics of arcade buildings, it can further enhance the connection between new buildings and traditional buildings, maintain the historical features of arcade buildings along the Long Bund, and contribute to the protection of historical buildings with urban characteristics.

In the practical application of urban design guidelines, attention should be paid to maintain a certain degree of flexibility, because the morphological typology analysis of the law is only the characteristics of the morphology, rather than the summary of the architectural style, so a blind imitation of antiquity, imitation of the façade style of the building of the Riding House is not in line with the development of the architectural type advocated by the morphological typology. At the same time for a region's morphological characteristics of the comb also need to consider the scope of its application, according to the morphological typology of the case study, often a region has its own unique morphological characteristics, and this morphological characteristics to another region is unreasonable and incompatible. In the case of the Riding House Street or other historic districts, the morphological typology should be re-analyzed to refine the architectural characteristics of the site.

Shortcomings and Prospects in the Research

The shortcomings of this study mainly fall into two aspects: first, deficiencies in the analytical methods, and second, limitations in the final application results.

(1) Due to the recent emergence of the Italian typomorphology school in domestic research, some classic works in typomorphology have not yet been translated and widely disseminated. This has made it challenging to integrate the analytical methods of various scholars and further clarify the details of the working methods. In the practical implementation, the lack of precise urban historical maps in China compared to Europe makes

it difficult to gain in-depth understanding of past urban historical morphology.

(2) The final results were hindered by the difficulty in conducting in-depth historical analysis during the early stages, which made it challenging to detail and summarize the historical features adequately. Consequently, there is room for further refinement in the urban morphological design guidelines.

In conclusion, the purpose of this study is to apply Western typomorphology methods to practical research on Chinese arcade buildings, expanding the application of typomorphology in different cultural contexts. During the process of theoretical learning and application, the author also understands that the city is an ever-changing process. In the context of historical urban preservation in modern China, it is essential to preserve not only the building styles and forms of historical neighborhoods but also to grasp the morphological characteristics of historical buildings. This will facilitate further protection and promotion of these features, providing more possibilities for dialogue between new and historical buildings

Reference

[1]Kristjánsdóttir S. Roots of urban morphology[J]. ICONARP International Journal of Architecture and Planning, 2019, 7: 15-36.

[2]Moudon, Anne Vernez.“Getting to Know the Built Landscape: Typomorphology”. The Urban DesigrReader,(1994) p: 256-281

[3]彭长歆,杨晓川.骑楼制度与城市骑楼建筑[J].华南理工大学学报(社会科学版),2004(04):29-33.DOI:10.19366/j.cnki.1009-055x.2004.04.007.

[4]陈飞,谷凯.西方建筑类型学和城市形态学:整合与应用[J].建筑师,2009(02):53-58.

[5]Whitehand J W R, Gu K. Extending the compass of plan analysis: a Chinese exploration[J]. Urban Morphology, 2007, 11(2): 91-109.

[6]姚圣,陈锦棠,田银生.康泽恩城市形态区域化理论在中国应用的困境及破解[J].城市发展研究,2013,20(03):1-4.

[7]朱知麟,田银生.量化分析方法在康泽恩城市形态学中的运用探索——以广州传统街区为例[J].南方建筑,2022(09):8-18.

[8]蒋正良.意大利学派城市形态学的先驱穆拉托里[J].国际城市规划,2015,30(04):72-78.

[9]邓浩,朱佩怡,韩冬青.可操作的城市历史——阅读意大利建筑师萨维利奥·穆拉托里的形态类型学思想及其设计实践[J].建筑师,2016(01):52-61.

[10]陈飞.一个新的研究框架:城市形态类型学在中国的应用[J].建筑学报,2010(04):85-90.

[11]齐文举. 从房屋类型到城市形态—阅读吉安弗里科·卡尼吉亚的形态类型学思想[D].东南大学,2017.

[12]Kropf K S. An alternative approach to zoning in France: typology, historical character and development control[J]. European planning studies, 1996, 4(6): 717-737.

[13]董亦楠. 南京小西湖历史地段保护与再生中的形态类型学方法[D].东南大学,2019.DOI:10.27014/d.cnki.gdnau.2019.004581.

[14]马可·德诺西欧,玛蒂娜·克拉波利基奥,肖潇.巴勒莫的形态和皮埃尔·路易吉·切维拉蒂的地图[J].建筑师,2023(01):6-12.

[15]Marzot N. The study of urban form in Italy[J]. Urban Morphology, 2002, 6(2): 59-73.

[16]Cataldi G. From Muratori to Caniggia: the origins and development of the Italian school of design typology[J]. Urban morphology, 2003, 7(1): 19-34.

［17］Gianfranco C, Luigi M G. Interpreting basic buildings[M]. Altralinea Edizioni, 2017.

［18］Gianfranco Canigeia, Gian Luigi Maffei, Composizione architettonica e tipologia edilizia. l. l progetto nel'edilizia di base

Marsilio,Venezia,1984

［19］Romano M. La città come opera d'arte[M]. Torino: Einaudi, 2008.

［20］Whitehand J W R. The structure of urban landscapes: strengthening research and practice[J]. Urban morphology, 2009, 13(1): 5-27.

［21］Conzen M R G. Alnwick, Northumberland: a study in town-plan analysis[J]. Transactions and thesiss (Institute of British Geographers), 1960 (27): iii-122.

［22］Whitehand J. Urban morphology and historic urban landscapes[J]. World Heritage Papers, 2010, 27: 35-44.

［23］Moudon A V. The research component of typomorphological studies[C]//Paper for AIA/ACSA Research Conference, Boston, USA. 1987.

［24］Kristjánsdóttir S. Roots of urban morphology[J]. ICONARP International Journal of Architecture and Planning, 2019, 7: 15-36.

［25］Kropf K S. An alternative approach to zoning in France: typology, historical character and development control[J]. European planning studies, 1996, 4(6): 717-737.

［26］Kropf K. Ambiguity in the definition of built form[J]. Urban morphology, 2014, 18(1): 41-57.

［27］Kropf K. The handbook of urban morphology[M]. John Wiley & Sons, 2018.

［28］Corsini M G. Residential building types in Italy before 1930: the significance of local typological processes[J]. Urban morphology, 1997, 1(1): 34-48.

［29］Regional architecture in the Mediterranean area[M]. Alinea Editrice, 2010.

［30］齐文举. 从房屋类型到城市形态—阅读吉安弗里科·卡尼吉亚的形态类型学思想[D]. 东南大学,2017.

［31］Samuels I, Pattacini L. From description to prescription: reflections on the use of a morphological approach in design guidance[J]. Urban Design International, 1997, 2(2): 81-91.

［32］Parolek D G, Parolek K, Crawford P C. Form based codes: a guide for planners, urban designers, municipalities, and developers[M]. John Wiley & Sons, 2008.

［33］陈锦棠,姚圣,田银生.形态类型学理论以及本土化的探明[J].国际城市规

划,2017,32(02):57-64.

[34]甘萌雨,保继刚.旧城中心区城市衰落研究——以广州沿江西区域为例[J].人文地理,2007(04):55-58.

[35]李小静,潘安.广州骑楼文化与城市交通[J].南方建筑,1996(02):11-13.

[36]杨颖宇.近代广州长堤的兴筑与广州城市发展的关系[J].广东史志,2002(04):12-17.

[37]林冲. 骑楼型街屋的发展与形态的研究[D]. 广州：华南理工大学建筑学院 2000.）

[38]吴简池. 广州长堤空间史研究（1888-1938）[D].华南理工大学,2018.

[39]李俊. 广州近代城市中轴线空间史研究[D].华南理工大学,2019.DOI:10.27151/d.cnki.ghnlu.2019.003792.

[40]黄慧明. 1949 年以来广州旧城的形态演变特征与机制研究[D].华南理工大学,2013.

[41]彭长歆.“铺廊”与骑楼:从张之洞广州长堤计划看岭南骑楼的官方原型[J].华南理工大学学报(社会科学版),2006(06):66-69.DOI:10.19366/j.cnki.1009-055x.2006.06.013.

[42]刘琼琳. 广州近代商贸建筑研究[D].华南理工大学,2015.

[43]石安海.岭南近现代优秀建筑.1949～1990 卷[M].中国建筑工业出版社,2010.

[44]刘楠. 近代广州骑楼装饰的文化地域性格研究[D].华南理工大学,2011.

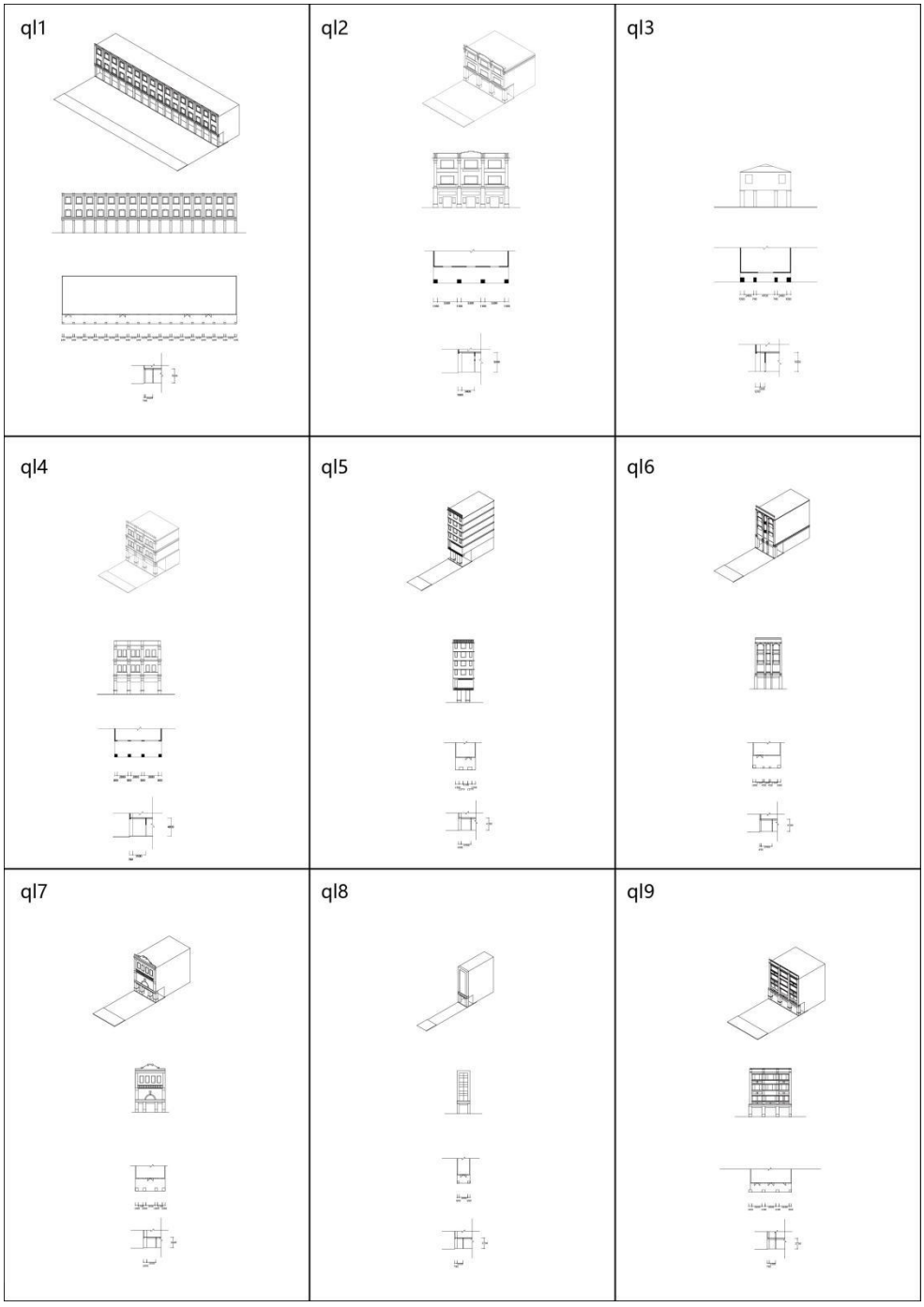
[45]石安海.岭南近现代优秀建筑.1911～1949 卷[M].中国建筑工业出版社,2010.

[46]刘心宇,姜省.市政法规影响下的民国广州沿江商业空间特征——以长堤周边路段骑楼底空间为例[J].南方建筑,2020(06):76-83.

[47]刘心宇. 民国广州市政法规影响下的商业骑楼街道空间研究[D].广州大学,2020.DOI:10.27040/d.cnki.ggzdu.2020.000937.

Appendix

During the writing of this thesis, the author conducted surveys of the ground-floor spaces and facade dimensions of 57 buildings along the Long Bund. The measured data was organized into tables to assist in formulating architectural morphology design guidelines.



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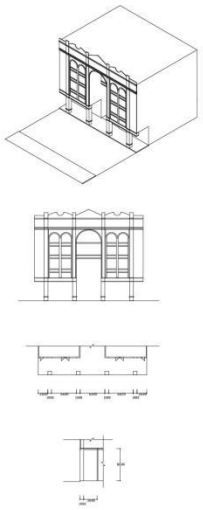

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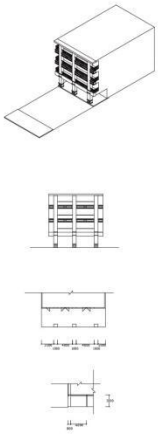

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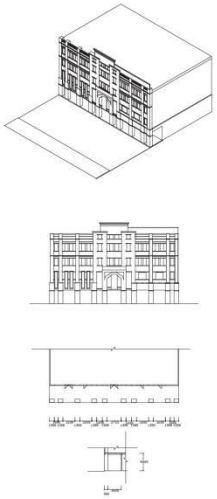

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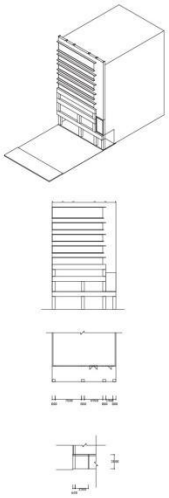

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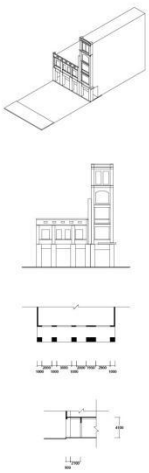

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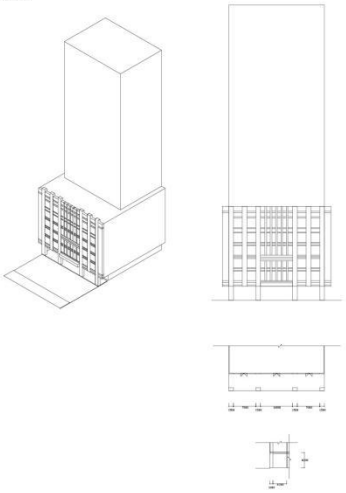

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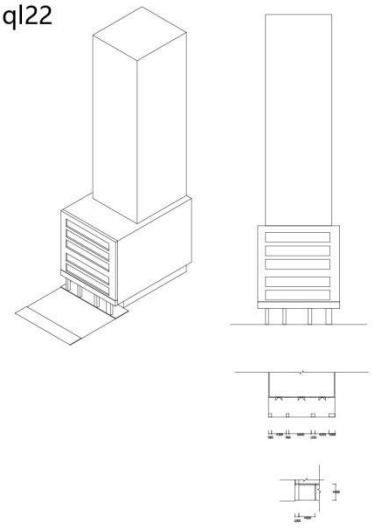

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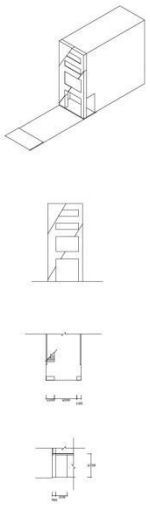

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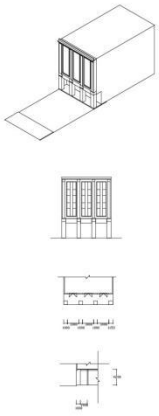
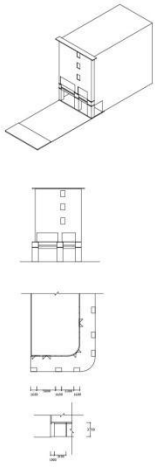
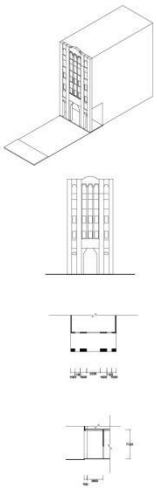
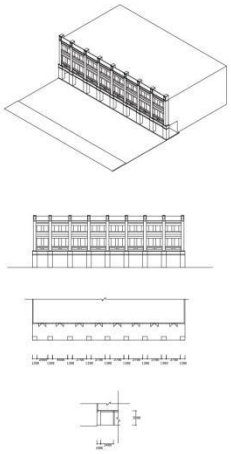
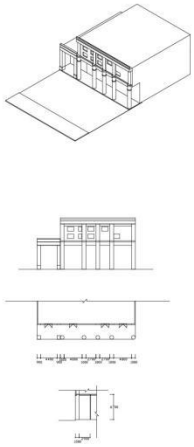
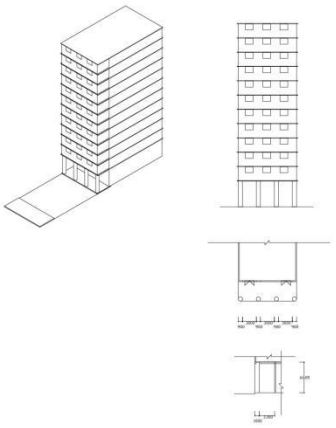
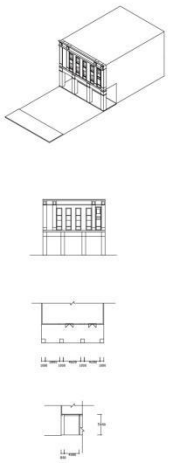
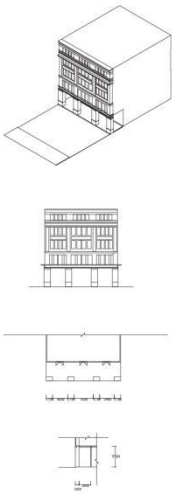
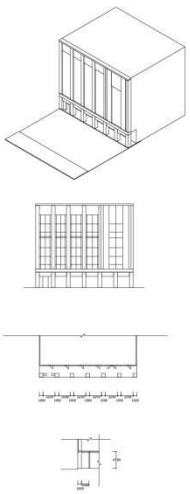
ql28 	ql29 	ql30 
ql31 	ql32 	ql33 
ql34 	ql35 	ql36 

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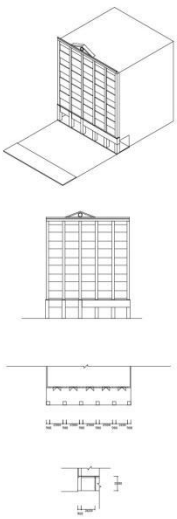

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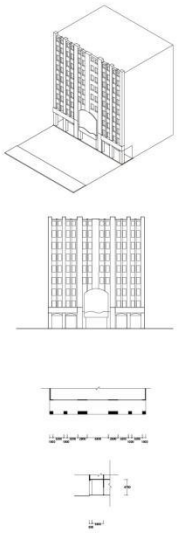

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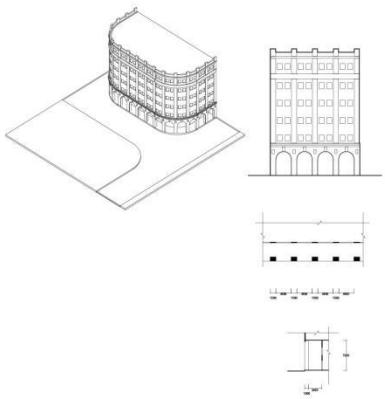

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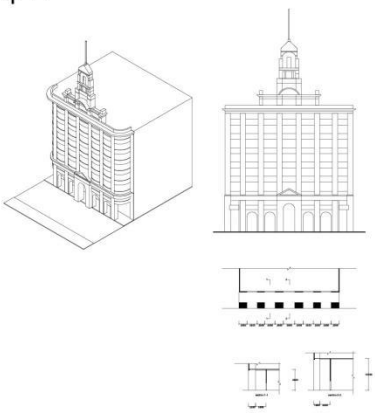

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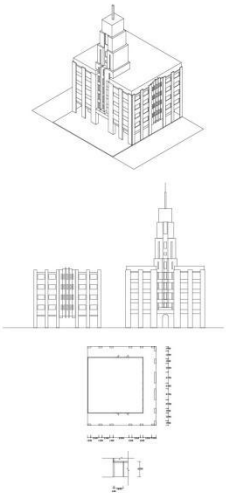

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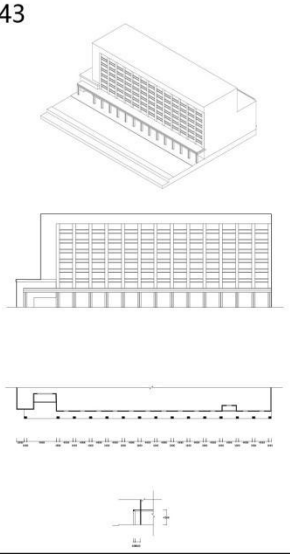

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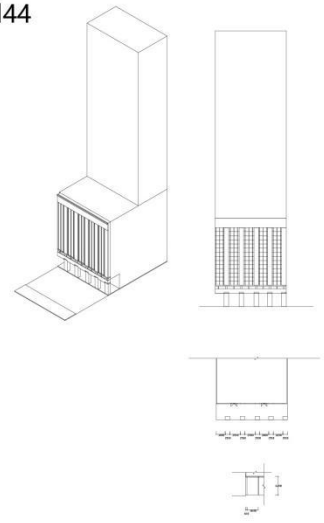

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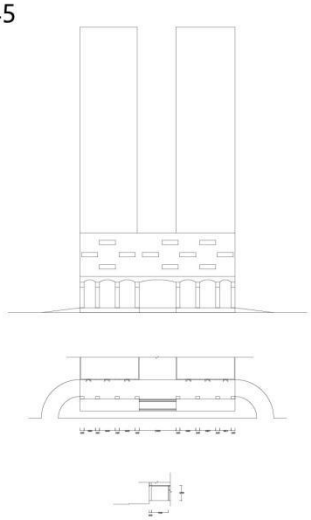

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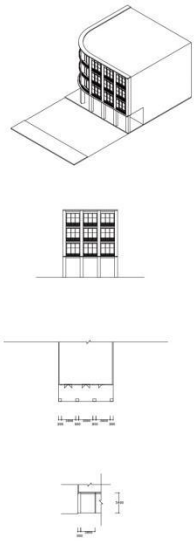

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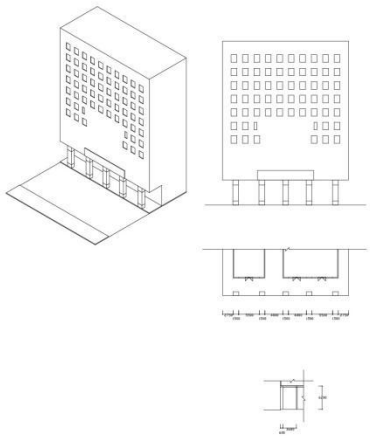

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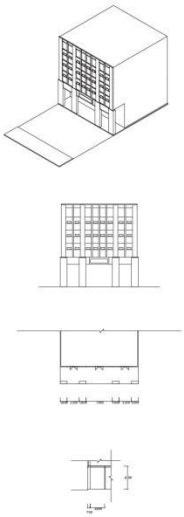

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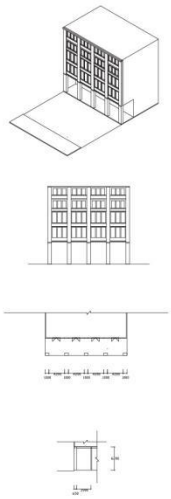

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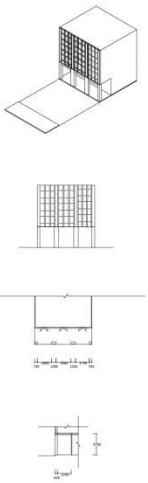

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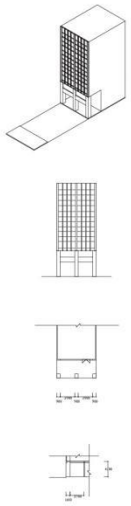

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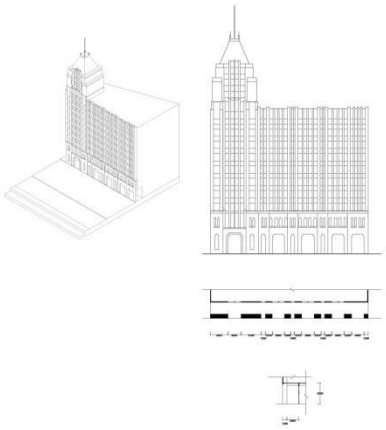

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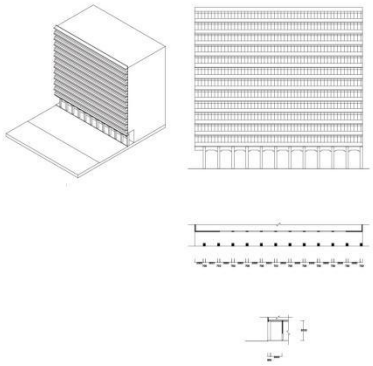

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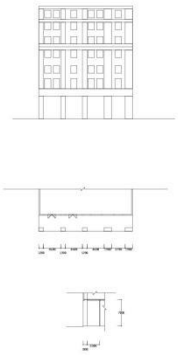

攻读硕士学位期间取得的研究成果

一、已发表（包括已接受待发表）的论文，以及已投稿、或已成文打算投稿、或拟成文投稿的论文情况**（只填写与学位论文内容相关的部分）：**

序号	作者（全体作者，按顺序排列）	题　　目	发表或投稿刊物名称、级别	发表的卷期、年月、页码	与学位论文哪一部分（章、节）相关	被索引收录情况

注：在“发表的卷期、年月、页码”栏：
1 如果论文已发表，请填写发表的卷期、年月、页码；
2 如果论文已被接受，填写将要发表的卷期、年月；
3 以上都不是，请据实填写“已投稿”，“拟投稿”。
不够请另加页。

二、与学位内容相关的其它成果（包括专利、著作、获奖项目）

Acknowledgements

Once upon a time, I have been writing in front of my desk until the moon sets and the stars fall. During the examination period, I have received help from many people, thanks to the company of my parents, the encouragement of my study friends, and the serious and careful teaching of my undergraduate teachers.

I have dreamed of crossing thousands of mountains, and I have traveled across the sea and the sky to study in a foreign country. When I was studying abroad, I benefited a lot from the knowledge taught by the teachers of Politecnico di Torino. Emiliano Matta brought me into the amazing world of bridge mechanics, and he once attended a class for twelve hours in a row just to answer the questions of every student's homework, while Francesca Governa corrected my attitude towards academics with her rigorous and pragmatic spirit of scholarship. Marco Trisciuoglio's lectures on Morphological Typology were very insightful, and his lectures made the originally difficult theories easy to understand, and many of the theories and applications in my dissertation came from his reflections on the relevant contents of the course.

This ten thousand word graduate thesis for me is no less than a grand masterpiece, the text into not only my own wisdom, it is the thesis writing Zhou Jianyun teacher on my thesis topic selection of the views and comments, so that I can be in the correct direction of the thesis on the way forward, it is the Mo Zhejuan teacher and Ms. Qi Dongjin with their wealth of knowledge, for my long-drained thinking to add more bricks and mortar, but also each and every one. It is also my girlfriend's care and companionship in every difficult day. I am grateful to you, hidden in my words, and touched in my heart.

At this point, on behalf of the graduate school career has come to an end, once again thanked the people who have helped me during graduate school, I wish myself and all the students graduated at the same time, although the road ahead is long, but still should not lose the courage to move forward, "no worries about the road ahead without a friend, the world who does not know you."

3.答辩委员会对论文的评语

（主要内容包括：1.对论文的综合评价；2.对论文主要工作和创造性成果的简要介绍；3.对作者掌握基础理论、专业知识程度、独立从事科研工作能力以及在答辩中表现的评价；4.存在的不足之处和建议；5.答辩委员会结论意见等）

硕士研究生沈南君完成的题为《广州长堤大马路骑楼建筑形态特征及其形态管控研究》的学位论文，对广州长堤大马路上的骑楼建筑展开研究，具有一定价值，选题具有较好的理论意义和适用价值。

作者详细地归纳和评述了一定量的相关文献，较好地掌握了该领域国内外的研究现状和发展方向。论文研究内容完整，研究方法较正确。该论文关注长堤大马路上的骑楼建筑所面临的骑楼文化缺失的问题，通过案例研究以及理论研究形成城市设计的形态设计准则，并进一步对场地内的建筑进行了详细的城市形态设计，对场地建筑的现状，进行了较为详细的建筑测绘调研，达到较好的深度要求。论文概念清晰，结构完整，叙述恰当，分析充分，所完成的设计方案体现一定设计思考与创新应用能力。

答辩中沈南君较好地回答了提出的问题，答辩委员会同意通过硕士学位论文答辩，同意毕业，并建议授予硕士学位。

论文答辩日期：2023 年 9 月 4 日　　答辩委员会委员 5 人

表决票数：同意毕业及授予学位（5）票

同意毕业，但不同意授予学位（ ）票

不同意毕业（ ）票

表决结果（打"√"）：同意毕业及授予学位（√）

同意毕业，但不同意授予学位（ ）

不同意毕业（ ）

答辩成员签名	（主席）		Mauro Berta（线上参会，秘书代签）
答辩秘书签名			