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Towards the Methodology for the Reuse of Industrial Heritage in China

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Introduction

In China, industrial heritage has recently emerged as a new subject into public's view.

During the process of speedy urbanization and the deindustrialization that has interested the country in the past two decades, the term "industrial heritage" has become more and more quoted in media and public discourse, although this concept itself is still ambiguous. The abandoned industrial relics are often regarded as a sign of recession, so they become objects that are firstly considered to be eliminated in urban renewal and reconstruction. Otherwise, facing the growing demand of (not high cost) urban space, the idle industrial building and sites located in inner city are seen as resources able to be reused. As a consequence, the protection of industrial heritage is in discussion.

In China, the regulations for the industrial heritage is still at the beginning. More specifically, it is ruled under the cultural heritage protection system, with regard to the classification, the protection principles and the legal obligation. However, it is not surprising that such a system cannot be fully applied to the industrial heritage. Once industrial urban areas and buildings are identified as protected cultural relics, according to the law, the ownership interest (use, management and profit) should be in charge of administrative departments of cultural heritage. Thus, in many cases, the regulation related to the heritage system becomes a significant burden for the urban development.

Encouraged by the government, many cities are exploring their ways to deal with the industrial building and sites. Among them, Shanghai and Beijing are in the leading position. Their reuse solutions have become a paragon that the other Chinese cities want to follow and imitate. However, the unbridled methods adopted raise not small dilemmas. According to some critics - for instance - a selective history (reflecting the urban nostalgia of the past rather than the authentic history) is represented and promoted when these industrial buildings are renovated into new art studios, offices or cultural uses.

One of the striking outcomes of a protection system should be to find the right balance between preservation and change. This is true for the industrial heritage too, which needs its own laws and regulations. Moreover, besides the industrial heritage with high heritage values, there are also other industrial heritage that cannot be listed in the protection system, but they need to be managed. In this sense, the industrial heritage itself needs to be divided into different categories in the aim of using differentiated methodologies for the protection and reuse. In particular in China, due to the large quantity of "ordinary" industrial buildings and sites in the inner city, which become obstacles for the rapid urban development, a reuse methodology with various approaches deserves a deeper study.

But though China is the main area of interest of this study, a closer examination of the European literature can help us draw contrast and parallel on the topic "industrial heritage". By reading of industrial heritage's conceptual and methodology dimensions in the European context, it can be seen that there is an evolutional process from the industrial archaeology to the industrial heritage and now to the industrial landscape. Generally speaking, the industrial heritage has gone from a specific interest in the monument (the individual building or a single machine) to the industrial sites (including the machines, buildings and its infrastructure), then to the whole industrial

area and industrial landscape. By contrast, in China, the emerging reuse of industrial building and sites, strictly related to the goals of economic development in urban regeneration, became suddenly an opportunity for the conservation and a pressure for the development of industrial archaeology/heritage. But there is a divorce between the flourishing reuse practices and the immature management system.

The theme of this dissertation is to reflect on the reuse methodology for the industrial heritage, through the analysis of different reuse ways used in the Chinese cities. A comparative perspective with typical methodologies and strategies used in Europe is barely sketched in order to illuminate the specificities of the Chinese situation. The discussion on the industrial heritage mainly focuses on the immovable tangible industrial heritage in modern and contemporary time (after 1860), including the industrial buildings and industrial sites. They are called *Industrial Architecture Heritage*, according to definition provided by the Architectural Society of China established in the Industrial Architecture Heritage Academic Committee (IAHAC), which is the first academic organization for industrial heritage preservation in China. The other types of industrial heritage, such as the industrial equipment, production technology and enterprise culture, are also significant and should not be ignored in the reuse.

Based on the main question--what is the methodology for the reuse of industrial heritage in China--there are some sub-questions: What are the main characteristics of the industrial heritage in China? How can the industrial heritage be recognized and protected in China? What is the regulation for the industrial heritage in China? What are the operation mechanisms of current reuse approaches for the industrial heritage in China? What are the problems of the conventional reuse methodology in China? What can we learn from the management and reuse methodology in Europe? Where is the balance between preservation and transformation of industrial heritage in China? How is it possible to deal with the conflict between economic goals and the value enhancement of industrial heritage?

The whole dissertation is divided into six chapters: (1) Identifying the Industrial Heritage in China: Dilemma and Opportunities; (2) Exploring the Reuse Ways of Industrial Heritage in China; (3) Industrial Heritage in the Context of Europe: Conceptual and Methodological Issues; (4) Methodology for the Reuse of Industrial Building --Case Study: 1933 Old Millfun, Shanghai; (5) Methodology for the Regeneration of Historic Area with Industrial Heritage--Case study: Tianzifang , Shanghai; (6) Distinguishing the Methodology for the Reuse of Industrial Heritage in China.

Their first part has a brief review of the question of industrial heritage between demolition, protection and reuse under the background of distinctive situation in China. The Chinese definition of industrial heritage is discussed with the industrialization process and its particularity different from the western counterpart. Since the management and regulations of industrial heritage are under the cultural heritage protection system, therefore, it is inevitable to have a discuss on the cultural heritage in terms of conceptual dimension and the legal management system in order to explain the difficulty in the protection of industrial heritage.

The second chapter focuses on the different reuse ways of industrial heritage in several Chinese cities. The main reason for such a regional perspective is that the practice of

industrial heritage reuse has been largely a result of their unique industry development history accompanied by the uneven policies in protection and reuse. As a result, a total of five cities are selected in this part: two municipalities directly under the Central Government—Beijing and Shanghai, which are the biggest metropolis in China; another two cities in the eastern coastal region—Tianjin and Nanjing; and one city in the north-east region—Harbin, a typical city in China's traditional industrial base. They all industrial cities and facing the problem of abandoned industrial buildings and facilities after the de-industrialization. By reading the different reuse ways and protection policies and implementation in these cities located in different regions, the big picture of industrial heritage reuse in China would be showed together.

The main aim of the third chapter is to read the evolution of industrial heritage's conceptual and methodology dimensions in the Europe context. The concepts of "industrial archeology", "industrial heritage" and "industrial landscape" are discussed respectively. It could say that industrial heritage always plays a central role when the European countries are dealing with these industrial remains throughout the social and economic programs. Therefore, the innovation of methodologies and the diversification of strategies, including the "patrimonialization", industrial heritage tourism, Ecomuseum and trans-border collaboration, are studied in order to give some useful experience for the conservation and reuse of industrial heritage in China

In the fourth and fifth chapters, with the two case studies of 1933 old Millfun and Tianzifang area, the specific reuse methodology of industrial heritage is present in both architecture and urban level.

In the first case, through the restoration and renovation from 2006 to 2008, the original abattoir is reused as spaces for creative industry, such as conference, exhibition, banquet and office. This study, including the historical research on the realization of architecture and the reuse methodology research, shows how the protected industrial heritage can be rehabilitated with the new uses. The aim of historical research is to reveal the original designs and construction process of architecture, such as the original function, original architectural space, original material and original technology, basing on architectural archives from Shanghai Municipal Archives. Meanwhile, through reading the drawings, interviewing the architects who design it and site investigation, the strategy and methodology used for 1933 old millfun are studied in details.

In the second case of Tianzifang, the mixed industrial and residential area was transformed into art community and commercial space. The aim of this research is to explore that how did a decline historical block mingled with industrial and residential functions gradually become such a popular and vibrant place with community-initiated rehabilitation in the context of huge transform over the past twenty years. Through the literature review and fieldwork, the historical geography of this area and the transformation of this area are revealed. Then the particularities of Tianzifang's dramatic regeneration process are identified in the aim of contributing industrial heritage in the rehabilitation of historic districts.

The sixth chapter is trying to summarize the characters of the typical reuse modes, such as government-leading reuse, enterprise-leading, developer-leading and government-assisting reuse, "bottom-up" reuse, pointing out their operation mechanism and the existing problems. Finally, this study suggest the methodology for

the reuse of industrial heritage by offering the protocols in investigation, assessment, feasibility study and design principles for reuse.

One of the major challenges I faced in writing such a research work is that the methodologies and strategies for the reuse of industrial heritage in Europe are difficulty to outline because of its complexity. There are difference between in the various European countries in term of policies and response manners. Moreover, due to the different contexts, especially the different institutional system, land use system and the varying degrees of urbanization, the experience from Europe is impossible to be applied in China directly. Another challenge is that building a holistic methodological system for the reuse not only needs analysis on the operation mechanism and design strategies, but also needs studies on the policies and the organization system and even the economic system.

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Chapter 1 Identifying the Industrial Heritage in China: Dilemma and Opportunities

This part has a brief review of the questions of industrial heritage between demolition, protection and reuse in China. Based on the international experiences, Chinese scholars have started to study the industrial heritage in the context of China, taking its own industrial development history as a reference. Meanwhile, since the management and regulations of industrial heritage are within the cultural heritage protection system, therefore, it is inevitable to discuss the cultural heritage in terms of conceptual dimension and the legal management system in order to explain the difficulty in the protection of industrial heritage.

1.1 The Discussion of Industrial Heritage between Demolition, Protection and Reuse

In the international framework, since the 1960s, the European and American developed countries walked from the industrial age to post-industrial age. Many cities suffered this "de-industrialization" heavily, which had a catastrophic effect to make the unemployment rose and other social problems.[1] With the change of urban function and the adjustment of industrial structure, tertiary industry developed gradually and occupied the dominant position instead of secondary industry, which caused the traditional industry gradually decline, industrial building such as the original factories, warehouses, docks, etc. lose their original functions and a large number of facilities be left unused. This phenomenon can also help to understand and explain what happened and what is happening in the Chinese cities.

Before the Reform and Opening-up [2], the main mission of China's urban construction was to build new buildings. For the economic development level was not so high and speed was slow, the development of the city was progressive and the change of urban landscape was also continuous. Since 1980s, the economic development speed grew rapidly. The combined roles of urbanization and deindustrialization brought out great changes. On one hand, there was a rapid urbanization which resulted in large quantities of rural immigrants moved to cities. From just 18% in 1978, China's urbanization rate had increased at 0.9% on average each year. At the end of 2011, China had 680 million urban residents - 51.27 per cent of China's entire population of nearly 1.35 billion[3]. This urbanization made the cities facing the high pressure in terms of population capacity, employment opportunity and shortage of space resources. The whole society held the strong will to change standing low quality of living conditions and city environment.

On the other hand, following the economic integration process and the adjustment of industrial structure, the proportion of traditional manufacturing industry in urban areas

[1] Micheal Stratton, *Industrial Buildings: Conservation and Regeneration*, *Tourism* (London;New York: Taylor & Francis, 2000), p. 232.
[2] Since 1979, China has pursued a policy of reform and opening to the outside world. Major efforts have been made to readjust the economic structure, and reform the economic and political systems. See more in http://www.chinadaily.com.cn/china/cpc2011/2011-05/10/content_12480513.htm.
[3] The current plans is to achieve a 67% rate by 2030, shifting 280 million people to cities within two decades According to China's National Bureau of Statistics. See more in Chinese Academy of Social Sciences, Blue Book on Micro Economy, April, 2012.

had been declining, while the functions in finance, trade, technology, information, and culture, etc. had increasingly become the main functions of cities. [4] The main reasons for this transformation are the establishment of conversion strategy for the traditional industry zones and the implementation of the strategy of "withdrawing the second industry entering the tertiary industry"[5]. As a result, the main modern industry cities like Shanghai, Beijing, Tianjin, Shenyang, Wuhan and Xi'an, had a profound effect by this shifting from the traditional industries to new industries. Meanwhile, the industrial buildings and facilities in certain areas were relatively obsolete and outdated in function in this transformation of manufacturing technology and mode of transportation.

Accomplished by a series of social and economic problems resulted by the deindustrialization and rapid urbanization, some cities in China had stepped into a new phase focusing on urban renovation and redevelopment since 1990s. In the beginning, when the city space faced the pressure of growing demand, one main solution was the large-scale clearance of obsolete buildings. These abandoned industrial buildings and sites have often been seen as obstacles. Due to the unawareness of the value of these disappearing "live industrial history" and their potential reuse values, it took a long time for the acceptance of these industrial *heritage*. At that time, with more communication that was frequent between China and Western countries, especially some efforts by the "returned architects" who finished the overseas study, numerous of successful urban-renewal cases and reuse cases of industrial heritage were introduced into China. These gave the Chinese architects the strong impression that the abandoned industrial building – normally considered to be demolished for new development – had great importance and value.

In Europe and USA, with the increasingly scarce resources and the rise of the environmental movement, valuing resources and sustainable development strategy gradually became the public's mutual concept. When the urban development needs more space, they no longer took horizontal extension but to fully tap the potential of the original city space. Therefore, the abandoned industrial buildings and locations became hot spots of redevelopment and revival. Meanwhile, previous slum reconstruction[6] and the renewal of inner city let all walks of life know the historical value and cultural value of the old buildings and realize continuous damage to urban development caused by large demolition. It also ensured that the renovation and utilization of industrial building would be easier to be adopted.

By contrast, China has its own distinctive scenario in terms of the juxtaposition of industrialization and deindustrialization. The well-developed urban areas were affected by the deindustrialization much, while many small cities and countryside area are still developing the industrialization. The discussion of industrial heritage was firstly

[4] See more in Wang Jianguo, Lu Zhipeng. Historical process and experiences of development and construction of world urban waterfronts. Urban Planning Review, 2001, (7):pp.41−46 (in Chinese)

[5] This policy aims to optimize urban land use through intensified utilization of construction land for higher production, in particular the shift of land use pattern from manufacturing to tertiary industries, as well as the concentration of manufacturing industries in certain locations outside the inner city.

[6] Some countries, such as Britain and USA, took measures to address the public health hazards posed by slum dwellings. The policy for slum reconstruction was accepted in the 1920s and 1930s, in the aim of removing slums and put new low-cost housing in their place.see more in http://ww2.unhabitat.org/mdg/documents/hic/Vol7_No3_the_evolution_of_slum_clearance_policies_in_london_and_paris.doc

emerged in the developed cities such as shanghai and Beijing. The experience in Europe and USA widened the thoughts and inspired the reuse and renewal of abandoned industrial buildings. However, it was not the architects to make the idle industrial relics get attention as renewable space resources. The more extensive discussion of industrial heritage started with some spontaneous reuse of the empty warehouses and factories by artists in 1990s[7]. Some individual artists and small or medium sized enterprises moved into these abandoned industrial buildings at affordable rents. Obviously, the characters of these industrial buildings, such like vast inner space, high ceiling and abundant daylight, meet the artists' need. Encouraged by their success, there were more cases emerged by renovating abandoned industrial building with new functions. Subsequently, with the encouragement of local governments, the reuse of industrial buildings had been flourishing under the goals of economic development and urban regeneration in many cities. During this dramatic process, the term "industrial heritage" was more quoted in media and public discourse, although this "alienation" concept itself was still ambiguous in the communication process. Therefore, the definition of "industrial heritage" need to be further discussed in the context of China

1.2 Defining the Industrial Heritage in the Context of China

Regarding the definition of industrial heritage, it varies depending on the different societies in the international community. The widely accepted definition was provided by *The Nimny Tagil Charter*[8].

"Industrial heritage consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education. ...The historical period of principal interest extends forward from the beginning of the Industrial Revolution in the second half of the eighteenth century up to and including the present day, while also examining its earlier pre-industrial and proto-industrial roots. In addition it draws on the study of work and working techniques encompassed by the history of technology." [9]

According to this definition, the term *Industrial Heritage* mainly refers to the remains of industrial culture from the beginning of the Industrial Revolution up to and including the present day, while also examining its earlier pre-industrial and proto-industrial roots.

[7] Taiwanese artist Teng Kun-Yen is the first one discovered old warehouse on the south bank of Suzhou Creek in Shanghai and converted it to his studio in 1998.
[8] The Nizhny Tagil Charter was adopted by TICCIH at its XII Congress in Russia in 2003, and is the international standard for the study, documentation, conservation and interpretation of the industrial heritage. http://www.ticcih.org/
[9] See more in The Nizhny Tagil Charter. http://www.ticcih.org/

When defining the industrial heritage in China, the fact we cannot ignore is that the industrial heritage of western countries, which recorded the source and achievements of its industrial revolution, is the mainstream industrial heritage of the research on this topic. In the procession of assessing the value of industrial heritage, we are usually accustomed to taking the western industrial revolution as the core values. [10] However, the progression of the industrial revolution is a variety of different countries, resulting the different characteristics of industrial heritage. As the *Taipei Declaration*[11] for Asian Heritage recognizes, there are particular nature of the historic remains of industry in Asia, their distinct character compared with other regions, the particular threats they face and the need for a concerted response to ensure their conservation.[12] In this sense, the industrial heritage in China should be distinguished from its counterparts in the West.

By comparison, the basic definition of industrial heritage in China is the same as the definition of industrial heritage in *The Nimny Tagil Charter*, but excepting " ..... also examining its earlier pre-industrial and proton-industrial roots" and "it draws on the study of work and working techniques encompassed by the history of technology"[13]. According to Que Weimin[14], the division of historical periods in the definition of Chinese industrial heritage is partly deferent with the "historical period' in the Nimny Tagil Charter.

The definition of Chinese industrial heritage, which mainly depends on the own industrialization process, is a result of some specialties in the industrial development. The different periods of industrialization process have shaped their own characters and made their significant contribution to Chinese industrial heritage. With the discussion about the particularity of these different periods, we can identify the industrial heritage in a more specific way, although there are still different arguments on it by different Chinese experts in the field of industrial heritage, Que Weimin claims that the beginning of Industrial Revolution, which appeared "in the second half of the eighteenth century" in the West, is not clear for the history of China. Therefore, he divides the historical periods into three times according to the development of economics and politics, including classic time before 1860, modern time during 1860 -1949, and present time (contemporary time) after 1949.[15] Regarding the classic times before 1860, he refers to the pre-industrial period, "within over 4thousand years of Chinese agricultural civilization, there are plenty of ancient technique monuments and sites of traditional handicraft industry (such as metallurgy, salt making, ceramics, silk fabrics, paper, tea, print, foodstuff, construct, hydraulic power using, traffic,

[10] Liu Bo Ying, "Modern Industrial Construction and Industrial Heritage in Mainland China : A View from the Concepts of ' Colonial ' and ' Post-Colonial ,'" in *The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress*, 2012, pp. 1–17.

[11] The XVth International TICCIH Congress 2012(Taipei, Taiwan) is the first full TICCIH Congress held in Asia. The congress announced a Taipei Declaration for Asian Industrial Heritage in order to emphasize the urgent situation of the rapidly disappearing industrial heritage due to the drastic urban development and global economy in Asia.

[12] Iain Stuart and others, *TICCIH National Reports 2012* (Chung Yuan Christian University， Taiwan, 2012), p. 190.p.190.

[13] QUE Weimin, "The Protection of Industrial Heritage in China," *BULLETIN OF TICCIH*, 32 (2006), pp.1–2.

[14] Que Weimin ,professor in College of Urban and Environment Sciences, Peking University; member of The World Heritage Research Center, P. R. China. In 2006, he had a report on the protection of industrial heritage in China to TICCIH in Italy.

[15] The years of 1860 and 1949 are two important historical turning point in China. The traditional China became a semi-colonial and semi-feudal country after 1860, while The People's Republic of China was founded in 1949.

weapons, etc.)" [16]. There are large quantities of industrial relics left until nowadays, one typical case is the Dujiangyan Irrigation System[17].

For the modern time during 1860-1949, Que Weimin argues "the industrial development in that period was influenced by the nature of semi-feudal and semi-colony，…… and the national industry heritage is the essence of modern industry heritage in China"[18]. According to Shan Jixiang[19], this period is very significant to the emergence of the modern Chinese city, which left numbers of industrial heritage today. He summarizes that the development of industry in this period helps the urban transformation of these cities in different levels: Firstly, some former ports, such as Shanghai, Tianjin, Wuhan, Qingdao and Guangzhou, were converted from commercial cities to commercial and industrial cities. More than 70% of employees in China assembled in these five cities. With more industry entry these cities, they gradually became the most important industrial bases. Secondly, with the birth of the industrial district, some provincial capital cities, such as Nanjing, Jinian, Shenyang, Fuzhou, Changsha, Hangzhou, Kunming, Chengdu, Xi'an and Taiyuan, experienced the transformation from feudalistic agricultural civilization to modern industrial civilization. Thirdly, some new cities emerged with national bourgeoisie capital, while the others, such as Wushun, Tangshan, Jiaozuo, Daye city, emerged with the rising of mining industry.[20]

The present times[21]is a significant period for the industrial development, leaving many modern industrial construction and facilities. Liu Boying[22], who also call this period as "modern industrial construction time", points out that the industrial construction in China obtained assistance from the former Soviet Union and the other countries of the socialist camp after 1949. The development of heavy industries was determined as priority. …Since 1978, China started the opening up and reform and it gradually transformed from planned economy into market economy. Then the foreign-invested enterprises re-emerged both in large number and great scale; and new type state-owned enterprises and private enterprises developed very fast. Chinese industrial development came into an all-around development period, and it gradually integrated into the global development.[23]

It is still necessary to mention that, besides industrialization process, the characters of Chinese industrial heritage is also influenced by the specialties in the geographical distribution of industry. Because of its vast territory, the different regions in China were

[16] Weimin, Que, "Industrial Heritage in China -It's Past, Present and the Future," in The TICCIH Seminar on Training and Education within the Field of Industrial Heritage, 2008, pp. 1–9

[17] Construction of the Dujiangyan irrigation system began in the 3rd century B.C. This system still controls the waters of the Minjiang River and distributes it to the fertile farmland of the Chengdu plains in China. http://whc.unesco.org/en/list/1001

[18] Weimin, Que, "Industrial Heritage in China -It's Past, Present and the Future," in The TICCIH Seminar on Training and Education within the Field of Industrial Heritage, 2008, pp. 1–9

[19] Shan Jixiang, the Director-General of State Administration of Cultural Heritage in China（2002-2012）

[20] Shan Jixiang, "Focus on a New Cultural Heritage-Protection of Industrial Heritage," *URBAN GEOLOGY*, 2009, 4–12 <doi:10.3969/j.issn.1674-4144.2009.05.001>.

[21] This period is also divided into several sub-periods as "Recovered Period"(1949-1956), "Great Leap Period"(1957-1960), "Adjusting Period"(1961-1965), "Cultural Revolution Period" (1966-1976), "Post Cultural Revolution Period"(1976-1983) and "Reforming & Opening Period" (1984-1990's) by Que Weimin. See more in QUE Weimin, "The Protection of Industrial Heritage in China," BULLETIN OF TICCIH, 32 (2006), pp.1–2.

[22] Bo-Ying Liu, a professor in Tsinghua University,China, is an expert in the study of industrial hard

[23] Bo Ying, Liu, "Modern Industrial Construction and Industrial Heritage in Mainland China : A View from the Concepts of ' Colonial ' and ' Post-Colonial ,'" in The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress, 2012, pp. 1–17.

unevenly developed with their own distinctions in term of the natural environment, social surroundings and history. The industrial development, the type of industrial heritage and the attribute of the value of industrial heritage are various in difficult regions and cities. Generally, "On the latitude and longitude arrange, industry develops in the coastal area faster than that in the inner land; on the topographical arrange, industry development level in the plain and basin is higher than that in the mountain and plateau; And on the clustery arrange, industry clustery in the different areas are similar……especially along Changjiang (Yangtze) River and around the seaboard cities" [24]. Base on this, the regional disparities are important factors in the defining of industrial heritage. The study of industrial heritage should be under a geographical perspective but not treated in the same general value determination and criterion.

The official definition of industrial heritage In China was for the first time given by the government in document *'Wuxi Proposal'*[25]:" the industrial cultural heritages is tangible and intangible industrial relics with the historical, sociological, architectural, technological and the aesthetic values, including factories, workshops, mills, warehouses, shops and other industrial buildings; mines, processing and smelting sites, energy production sites, transmission and usage sites, transportation facilities, social activities sites with industrial production, industrial equipment, production technology, data records, enterprise culture."[26] At present, the discussion on the protection and reuse of industrial heritage mainly focuses on the immovable tangible industrial heritage, including the industrial buildings and industrial sites. By contrast, the industrial equipment and the intangible industrial heritage have not obtained much attention yet.

[24] Weimin, Que, "Industrial Heritage in China -It's Past, Present and the Future," in The TICCIH Seminar on Training and Education within the Field of Industrial Heritage, 2008, pp. 1–9

[25] In Apr. 18, 2006 a symposium in Wuxi was held, and the 'Wuxi Proposal' was given by the committees and experts from ICOMOS China and other fields as the first official documentation about 'Industrial Heritage' in China.

[26] Translated from the *Wuxi Proposal* by author

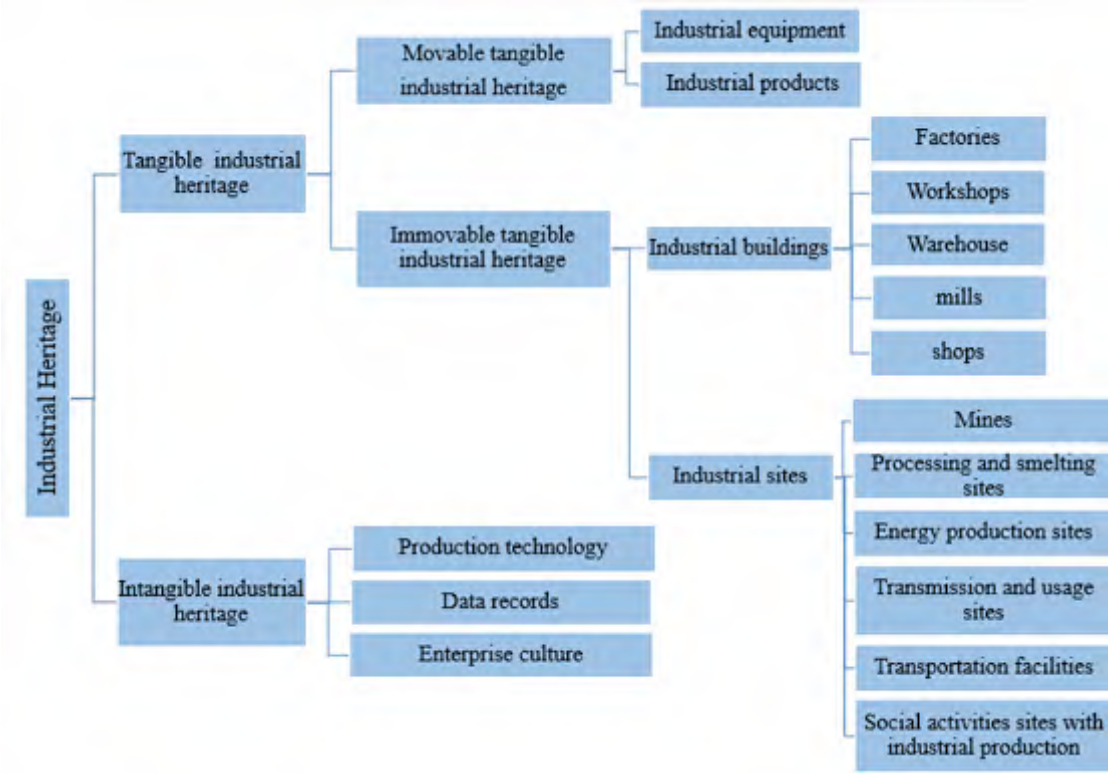

Figure 1-1 The definition of industrial heritage by *'Wuxi Proposal'* (Source: by author)

1.3 Industrial Heritage within the Cultural Heritage Protection System

Currently, the management and regulations for industrial heritage are under the cultural heritage protection system, therefore, it is inevitable to discuss the cultural heritage in terms of conceptual dimension and the legal management system, aiming of interpreting their relationship and the problems resulted from such situation.

1.3.1 A Review on the Evolution of Cultural Heritage Protection System

The "cultural heritage" was named "cultural relics" (wénwù), mainly because of its usage in current Chinese law. Due to their subtle differences in meaning, it is necessary to have a brief review on the history relevant of "antique", "cultural relics" and "cultural heritage" during the past 100 years. The semantic evolution of these words indicates the complicatedness of this process

At the beginning of the 20th Century, "antique" was the main expression used to indicate the Chinese ancient relics and ancient sites. This expression has its historical roots, distinguishing it from the meaning of "antique" under western context[27]. It was first used as legal term in the *Law of Antiques Preservation* promulgated by the government of the Republic of China in 1930. On the basis of mirroring the western modern cultural heritage legislation, *Law of Antiques Preservation was* the first law enacted for cultural relics protection in the Chinese history[28]. Modern archaeology was brought into China in 1930s, and people began to know cultural relics in the cultural level, explore the value of history, science, art, etc in it.

Society for Research in Chinese Architecture[29] began architectural heritage protection in China in the 1930s. The society professionally sort and research Chinese ancient architectural in a planned way. after the foundation of People's republic of China； The State Council promulgated *The provisional regulations for Protection of Cultural Relics in* 1961； In the early 1980 s, international cultural relic's protection principle represented by *Venice Charter* was introduced to China. In 1982, the *State Council* formally enacted *Law of the People's Republic of China on Protection of Cultural Relics*, which marked the cultural relics protection work began to be managed in a law-based manner. The historical value, artistic value and scientific value became the core of cultural relic's value which is stated in the law. The contents of cultural relics have been defined clearly as following[30]:

[27] The original intention of "antique" under western context is to indicate the monuments in the time of ancient Greece and Roman. see more in Françoise Choay and Ernesto d'Alfonso and Ilaria Valent (a cura di), *L'allegoria Del Patrimonio* (Rome: Officina Edizioni, 1995), p. 256.

[28] Song Zhang, "Review on the History of Legal System Building for Cultural Heritage(in Chinese)," *Historical and Cultural City Protection*, 03 (2009), 27–33.

[29]Society for Research in Chinese Architecture, established by Zhu Qiqian in 1930 and led by Liang Sicheng and Liu Dunzhen in 1931-1945, is the first academic society to study Chinese ancient architecture with modern methodology in China.

[30] See more in Law of the People's Republic of China on Protection of Cultural Relics

The State places under its protection the following cultural relics within the boundaries of the People's Republic of China:

(1) Sites of ancient culture, ancient tombs, ancient architectural structures, cave temples, stone carvings and murals that are of historical, artistic or scientific value;

(2) Important modern and contemporary historic sites, material objects and typical buildings that are related to major historical events, revolutionary movements or famous personalities and that are highly memorable or are of great significance for education or for the preservation of historical data;

(3) Valuable works of art and handicraft articles dating from various historical periods;

(4) Important documents dating from various historical periods, and manuscripts, books and materials, etc. that are of historical, artistic or scientific value;

(5) Typical material objects reflecting the social system, social production or the life of various nationalities in different historical periods.

Regarding the catalogues, the cultural relics can be divided into *Immovable cultural relics*[31] and *Movable cultural relics*[32]. The former can be "designated respectively as major sites to be protected for their historical and cultural value at the national level, sites to be protected for their historical and cultural value at the provincial level, and sites to be protected for their historical and cultural value at the city or county level"[33], while the latter shall be" divided into valuable cultural relics and ordinary cultural relics; and the valuable cultural relics shall be subdivided into grade-one cultural relics, grade-two cultural relics and grade-three cultural relics."[34] (Figure 1-2)

The "site", also named *"protection unit"*, is the joint name of the protected object which is determined to be listed as the immovable cultural relics. This range of *protection unit* consists of the protected object and the surrounding. According to different protection levels-- national level, provincial level and city or county level—the different level administrate departments set up instructions for the protection respectively. For example, at the national level, the *major sites to be protected for their historical and cultural value* [35] are cultural relics listed by the State Administration of Cultural Heritage.[36] In the corresponding, the other two are listed by the local administrative departments. Their main works of these departments are also including of making records, and setting up special organizations or personnel who are

[31] Immovable cultural relics, such as sites of ancient culture, ancient tombs, ancient architectural structures, cave temples, stone carvings and murals as well as important modern and contemporary historic sites and typical buildings. see more in *Law of the People's Republic of China on Protection of Cultural Relics*

[32] Movable cultural relics, such as important material objects, works of art, documents, manuscripts, books, materials, and typical material objects dating from various historical periods. see more in *Law of the People's Republic of China on Protection of Cultural Relics*

[33] see more in Law of the People's Republic of China on Protection of Cultural Relics

[34] *Ibid.*

[35] Major Site Protected for Its Historical and Cultural Value at the National Level (Chinese: 全国重点文物保护单位). Its english translation varies, including A Major Historical and Cultural Site Protected at the National Level, Major Historical and Cultural Site Protected at the National Level (both are official translations in the Law and the Regulation), Cultural Heritage Sites under State-level Protection (by Atlas of Chinese Cultural Relics series), Key Cultural Relic Unit under State Protection (semi-literal translation), etc.

[36] The State Administration of Cultural Heritage is the cultural relics administrative department of the State Council of China. The criteria and measures for the appointment of cultural relics shall be formulated by the State Administration of Cultural Heritage, which shall report them to the State Council for approval.

responsible for the management.

Since 1980s, entering the rapid urbanization process, large scale urban construction and the dramatic transformation enabled to think about the meaning and function of the history and culture accumulation has deposited for social life in a more extensive perspective. It prompted cultural heritage protection to be enlarged into a larger system, including of *(1) Cultural Relics; (2) Famous neighborhoods, villages and towns of historical and cultural value ;(3) Famous cities of historical and cultural value*, although the related laws and regulations for the latter two catalogue were immature.(Figure 1-2) Due to the limitation of the country's economic strength, cultural heritage did not get the concern seriously until the 1990s. In 1992, China putted forward the principles for the protection of cultural heritage: "preservation with timely rescue; utilization under strict control"[37].

In terms of the concept of cultural heritage, it was not clear and complete until 1985. In this year, China join in the *convention concerning the protection of the world cultural and natural heritage adopted* by UNESCO (*United Nations Educational, Scientific and Cultural Organization)*. It means that the recognition and acceptance of the ideas of *world heritage*, which is on the basis of the theory and practice of international cultural heritage protection system. Through UNESCO, the independent Chinese cultural heritage protection system had been connected with the international cultural heritage system. As the latter is based on the protection principles of *Venice Chapter*, the protection principles of which have also become the dominant principles in China.

Furthermore, in the year of 2000, China ICOMOS [38] issued *Principles for the Conservation of Heritage Sites in China*. It emphasized the "authenticity" in the protection, and stressed the protection principles putted forward by *Venice Chapter* again. In order to guide the protection work of cultural relics, the Flow Chart of the conservation process for the cultural heritage was defined for the first time. (Figure 1-4).

Facing the enlargement of the range of cultural heritage, in 2002, the state council revised the *Law of the People's Republic of China on Protection of Cultural Relics*.[39] On the basis of 1982 version, the scope of cultural relics was widen to the "important historical sites and typical architectures of modern and contemporary times"[40]. It also increased the protection requirements for famous cities, famous neighborhoods, villages and towns of historical and cultural value [41]. Later, the State Administration of Cultural Heritage issued *Rules for the Implementation of the Cultural Relics Protection Law of the People's Republic of China* and *Measures for the Administration of Culture Relics Preservation Projects* in 2003;

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[37] See more in the Law of the People's Republic of China on Protection of Cultural Relics（1982）

[38] China ICOMOS was found in 1993.The full name is Chinese commission for the international council monuments and sites. http://www.icomoschina.org.cn/zggjyzbhxh/24808.aspx

[39] The revised *Law of the People's Republic of China on Protection of Cultural Relics* was amended and adopted at the 30th Meeting of the Standing Committee of the Ninth National People's Congress of the People's Republic of China on 10-28-2002. Subsequently, the *Regulation for the Implementation of the Cultural Relics Protection Law of the People's Republic of China* is effective from 07-01-2003 See more in http://english.gov.cn/laws/2005-10/09/content_75322.htm

[40] See more in the Law of the People's Republic of China on Protection of Cultural Relics（2002）

[41] Measures for the protection of famous cities, famous neighborhoods, villages and towns of historical and cultural value shall be formulated by the State Council. See more in *Law of the People's Republic of China on Protection of Cultural Relics (2002)*

In 2005, the *Conservation Master Plan*[42] became obligated in protection work for *Major Sites Protected for their Historical and Cultural Value at the National Level*. The *Conservation Master Plan* involved value analysis, current status assessment, protection zone designation, management requirements, protective measures, and plans on research, exhibition, environmental concern, security, and disaster prevention, etc. The establishment of these procedures improved the capability to discover the values of the protected objects and to build long term targeted protective actions as well[43].

At the same year, "Cultural heritage" was took as a subject term officially in the *Notice of the State Council on Strengthening Protection of Cultural Heritages* issued by the State Council. It means the idea of cultural relics was began to be expanded to cultural heritage. The notice defined the content of the cultural heritage clearly: "cultural heritage includes tangible cultural heritage and intangible cultural heritage"[44]. Thus, the intangible cultural heritage began to be incorporated in the protection system[45].

In summary, with the evolution process of cultural heritage protection system in China, the implication of "cultural heritage" has been changed greatly along with the transformation and expansion of the word's meaning and continuous improvement of laws and regulations. For the concept of "cultural heritage", the term has been developed from "antique" to "cultural relics" and then "cultural heritage". Meanwhile, the range of protected objects is extended to tangible and intangible, the protected objects are enlarged from the single unit to area and even whole city. However, it should be pointed out that there is still no complete law to deal exclusively with the protection of cultural heritage now. The protection rules of cultural heritage still scatter in other legal documents[46], besides the *Law of the People's Republic of China on Protection of Cultural Relics*.

[42] the Conservation Master Plan was stipulated in the Compiling Guideline of Protection plan for Major Sites Protected for their Historical and Cultural Value at the National Level and The Approval Procedures of Compiling of Protection plan for Major Sites Protected for their Historical and Cultural Value at the National Level approved by the State Administration of Cultural Heritage in 2005.

[43] LV Zhou, "Chinese Culture Heritage Conservation in the Past the 30 Years（in Chinese）," *ARCHITECTURAL JOURNAL*, 2008, 1–5.

[44] See more in the Notice of the State Council on Strengthening Protection of Cultural Heritages issued by the State Council in 2005

[45] The Law of the People's Republic of China on Intangible Cultural Heritage was approved by The State Council in 2011

[46] The main legal documents are the Regulations of the People's Republic of China on Nature Reserves and the Interim regulations for the management of scenic areas and historical sites .

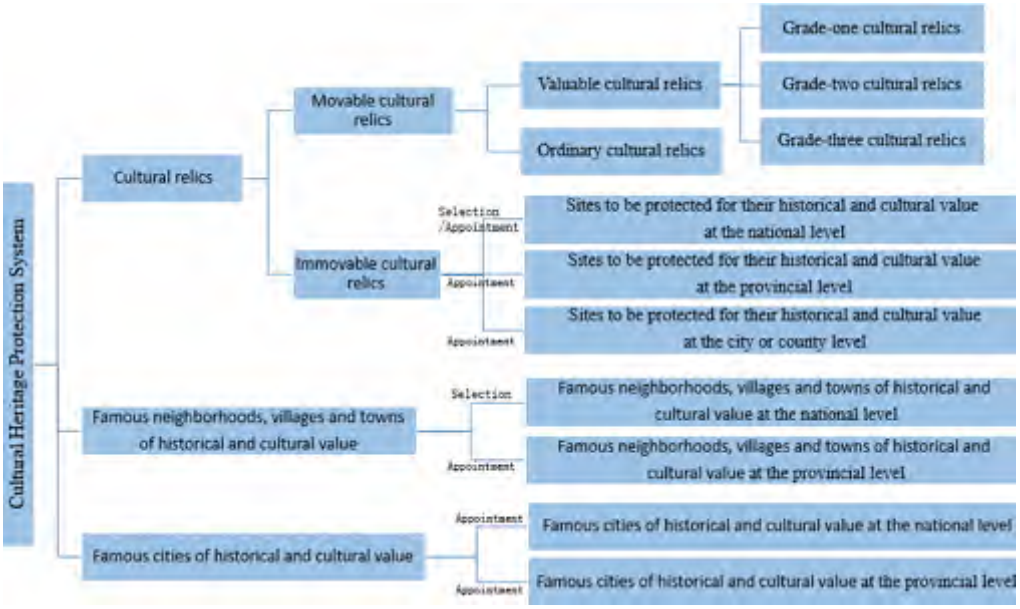

Figure 1-2 The framework of cultural heritage protection system in China (Source: by author.)

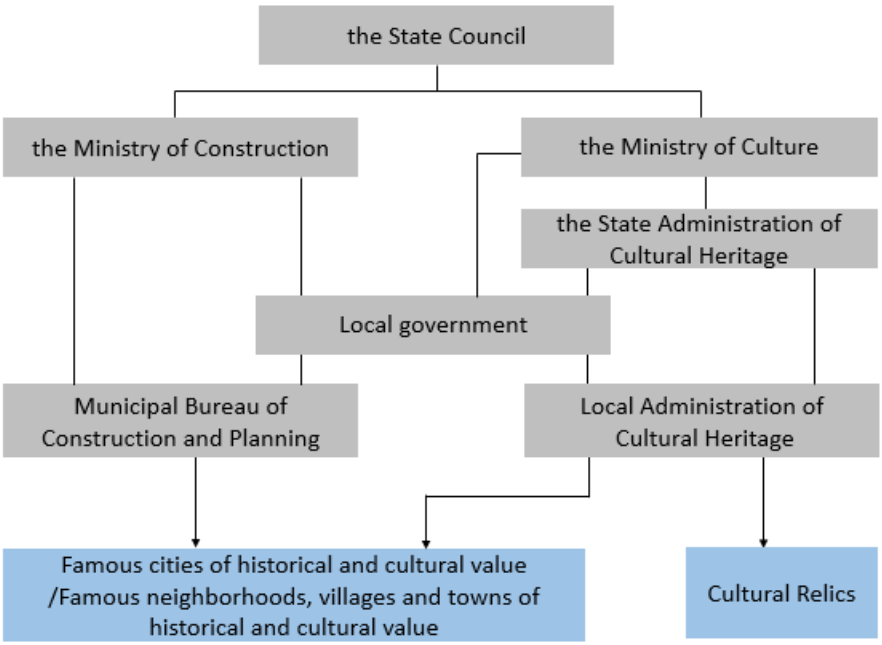

Figure 1-3 The institutional framework of culture heritage protection system in China (Source: by author)

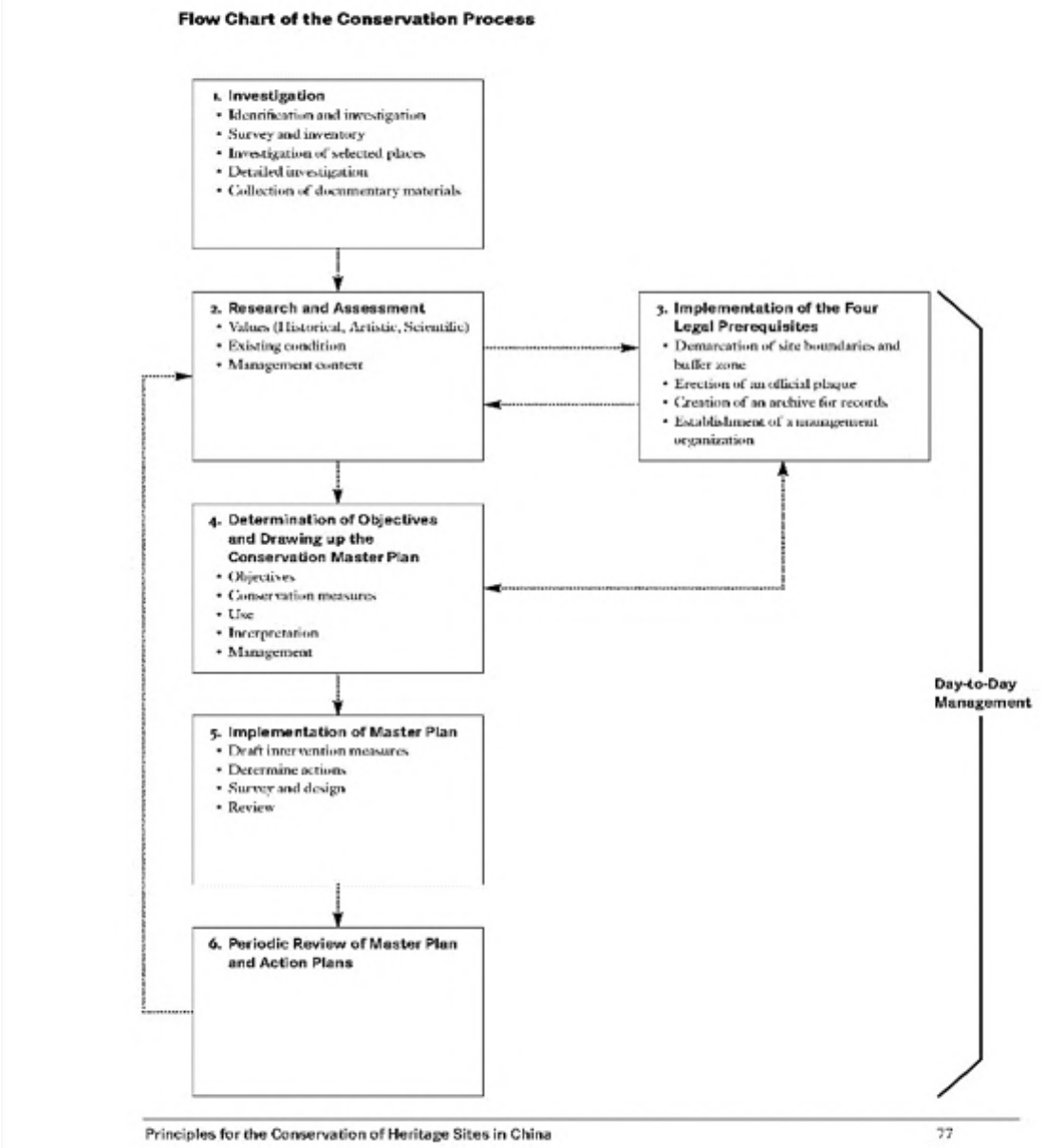

Figure 1-4 The Flow Chart of the Conservation Process (Source: *Principles for the Conservation of Heritage Sites in China* issued by China ICOMOS)

1.3.2 The Management Tool for the Protection of Industrial Heritage

Currently, the specific law system for industrial heritage has not been established yet, and the management is implemented under the current cultural heritage protection

system with a flexible way. The main legal basis for the protection of industrial heritage is same with the cultural relics. The whole legal framework is a vertical system, which takes the *Law of the People's Republic of China on Protection of Cultural Relics*（2002）as the core, matching with administrative regulation issued at the national, provincial，city or county level respectively.

By reading the definitions of industrial heritage and cultural relics, it can be seen that there are intersections in the scope between them. Broadly speaking, the majority of industrial heritage can be incorporated into the definition of cultural relics as "*typical material objects reflecting the social system, social production or the life of various nationalities in different historical periods.*"[47] Their features in common mainly involve aspects such as: they both have historical, artistic or scientific value; they are both non-renewable historical-cultural resources; they both include movable and immovable two kind of forms. Meanwhile, looking from the differences, cultural relics are tangible, while the industrial heritage also consists of intangible aspects, such as production technology, data records and enterprise cultural. So standing on this point, the industrial heritage can be seen a part of cultural relics, but it also has own particularity (Figure 1-5). More precisely, industrial heritage should actually have been classified as a cultural heritage instead of cultural relics.

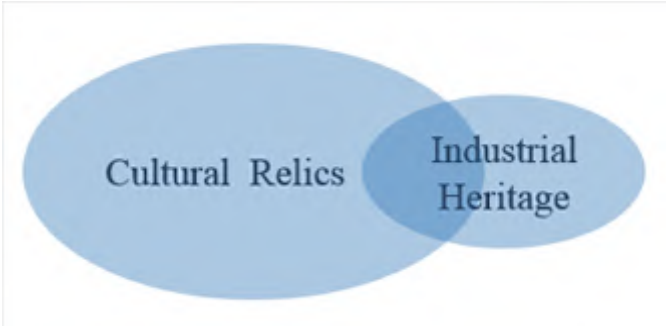

Figure 1-5 The relationship of cultural relics and industrial heritage according to the Chinese laws and related documents (Source: by author)

As SHAN Jixiang pointed out, "the industrial heritage of great value and significance, once identified, should be announced as cultural relics protection units, and make it truly be protected through related law and regulations. Industrial heritage, just like other cultural heritage, is non-renewable resource. Only if the recognition and protection work be carried out in advance, then the arbitrary abandonment and blind demolition can be prevented. "[48] In his opinion, on the basis of announcing industrial heritage which have particularly significant value as cultural relics protection units at all levels, it could gradually built a protection system for various industrial heritage of different categories. Once more and more industrial heritage is approved by the administrative departments at all levels in accordance with legal procedures and announced as cultural relics protection units, their values could be get recognized by general public .

[47] See more in Law of the People's Republic of China on Protection of Cultural Relics
[48] Shan Jixiang, "Focus on a New Cultural Heritage-Protection of Industrial Heritage," URBAN GEOLOGY, 2009, 4–12

With this legal framework, some valuable industrial heritages are under well protection, the industrial heritage which have been listed as protection unit can be directly applied the implementation regulations of cultural relics in terms of classification, protection principles and the legal liability. However, this management tool also resulted a lot of problem, because there are many differences between industrial heritages and cultural relics, such as standards on identification and classification; value assessment; management requirements, and social and economic benefits. Additionally, some significant factors, such as ownership, property rights, management pattern, will influence the protection of industrial heritages.

At present, all the industrial heritage listed in the legal protection systems is immovable cultural relic.[49] According the law, once immobile cultural relics are established as cultural relics protection units, its rights of use, management, profits and punishment are mainly disposed by the State Administration of Cultural Heritage and various administrative departments at all levels.[50] This undoubtedly caused a lot of restrictions to the property right for industrial heritage. As a matter of fact, in most cases, the industrial buildings and facilities is mainly disposed by state-owned enterprises or the state-owned assets supervision. It is impossible for these enterprises or government departments to give up the ownership of the industrial heritage, including the land use rights and property rights, under the background of continuous rapid rising of land price. Once industrial heritage are listed, besides the ownership relationships, the rights of use, management, profits and dispose will also be largely limited[51]. This is a result that the owner of industrial heritage property do not like to see. After all, they are mostly large enterprises, and there are many workers to support for living. In some cases, even if the production has been stopped, the owner of industrial buildings want to reuse them for lease, aiming of obtaining profit.

Facing these problems in reality, the State Administration of Cultural Heritage specially issued *The Notice of Immediately Correct Unauthorized Actions to the Management System of Cultural Relics Protection Units* in 2003. It severely criticized the unauthorized changes to the management of industrial heritage listed as the cultural relics protection unit, especially “the action of giving them to the tourism company for business without authorization"[52]. It also pointed out that" state-owned cultural relics protection units shall not be used as enterprise assets, in case of that they are must be used for other purposes, it should be reported to the related administrative department for examination and approval”[53]. Meanwhile, the function of state-owned cultural relics protection units only can be changed to establish museums or public truism spot. In

[49] Until now, there is no movable industrial heritage listed as valuable or ordinary cultural relics. The discussion of the industrial heritage protection is mainly focused on the immovable ones.

[50] Article 5 “Such immovable cultural relics as memorial buildings, ancient architectural structures, stone carvings, murals and typical architectural structures of the modern and contemporary times, designated for protection by the State, except where otherwise provided for by regulations of the State, are owned by the State. The ownership of State-owned immovable cultural relics shall remain unchanged when ownership or the right to use of the land to which such relics are attached changes.” See more in *Law of the People's Republic of China on Protection of Cultural Relics*

[51] Article 6 “Ownership of memorial buildings, ancient architectural structures, cultural relics handed down from ancestors and other cultural relics obtained in accordance with laws, which belong to collectives or individuals, shall be protected by laws. Owners of the cultural relics shall abide by State laws and regulations on the protection of cultural relics”. According to the *Law of the People's Republic of China on Protection of Cultural Relics*

[52] See more in The Notice of Immediately Correct Unauthorized Actions to the Management System of Cultural Relics Protection Units.

[53] See more in The Notice of Immediately Correct Unauthorized Actions to the Management System of Cultural Relics Protection Units.

case of it will be used for other purpose, it should be approved by the higher level of administrative departments of cultural heritage. It is forbidden to transfer and mortgage the immovable industrial heritage.

Being listed as protection unit can maintain the integrity and authenticity of industrial heritage, and this is exactly the advantage of cultural relics protection system. However, it can be seen that the shared management tool has resulted much problems. Since there are various kinds of industrial heritage the diversified ownership, it is difficult to unify them in a same management system. The property of the industrial heritage could be owned by the state-owned enterprise, the private sector or the local government. Therefore, it is impossible to manage all these kinds of industrial heritage by administrative department of cultural heritage independently.

Another problem caused by the shared management tool is that the industrial heritage, as a small category in the cultural relics, is difficult to be taken seriously its protection system. There are no specific department established to manage industrial heritage. Since 2000s, the administrative departments of cultural heritage began to put its scope on industrial heritage. But the usefulness for these efforts is limited. For example, in May of 2006, the State Administration of Cultural Heritage issued *the Circular of the Protecting the Industrial Heritage*, which required that "the local administrative departments of cultural heritage should take the protection of industrial heritage into local economic and social development planning and urban construction planning with the local people's governments at all levels"[54]. Furthermore, it was also required that "once the industrial heritage is threatened, administrative department of cultural heritage should have the right to intervene and stop."[55] However, as a notice, it didn't have legal effect and any regulation for protective actions and responsibility of related departments.

Actually, as relatively "weak" administrative department, these administrative department of cultural heritage cannot execute all these requirements in an effective manner. There are also some key questions not stipulated clearly by the laws and regulations, such as: What are the legal guarantee rights for the management of industrial heritage? Where do these rights come from? How to intervene and stop when the industrial heritage is threatened? Therefore, a special management tool for the industrial heritage and its related regulations are needed to be built in order to separate from the cultural heritage protection system.

[54] Translated from the Circular of the Protecting the Industrial Heritage by author
[55] Shan Jixiang, "Focus on a New Cultural Heritage-Protection of Industrial Heritage," URBAN GEOLOGY, 2009, 4–12 <doi:10.3969/j.issn.1674-4144.2009.05.001>

1.4 Management and Regulations on Industrial Heritage

In the international scale, the initial study of industrial heritage arose in Britain firstly, leading to its values be accepted by the public subsequently. The first world organization for research of industrial heritage, TICCIH (The International Committee for the Conservation of the Industrial Heritage), was established in 1978 to promote international cooperation in the fields of preservation, conservation, location, research, documentation, recovery, and training in all aspects of industrial heritage[56]. By comparison, in China, the study on the industrial heritage started relatively late, as well as the acceptance of its values. The management and related regulations are still developing.

In the academic filed, the investigation and study of industrial heritage began in 1980s. The modern industrial buildings was investigated in the occasion of the investigation of Chinese modern architecture. However, as a sub-catalog of modern architecture, the industrial buildings was not addressed much. Meanwhile, because most of the researchers involved in the investigation were in the domain of architecture design and architectural history, so the study focused more on the industrial buildings, but less on the industrial equipment and facilities.[57]

For the public, those abandoned industrial building and facility, the contaminated sites and these material carriers of the past industrial era have been often treated as obstacles. Due to the lack of awareness of protection and legal protection, a lot of precious value industrial heritage have been demolished in the urban construction and urban renewal. The misunderstanding also influenced many industrial heritage conservation planning and decision-making for a long time.

Industrial heritage has never been officially treated as an independent research subjects until the year of 2006 with the first session industrial heritages protection symposium held in Wuxi city, China. The *Wuxi proposal* had been adopted to acknowledge and protect industrial heritage for the first time. It clarified the definition of industrial heritages, the threats for industrial heritages, and the ways to protect industrial heritages. The suggestions putted forward by this *proposal* include: 1. Carry out the survey and evaluation of industrial heritages as soon as possible; 2. Announce the important industrial heritages as cultural relics protection units on various levels, or register them as immobile cultural relics; 3. intensify efforts of publicity, give media play a role of supervision, encourage the public to participate in the preparation of special planning for industrial heritage protection; 4. Treat differently and utilize the industrial waste facilities and buildings. However, it is just a declaration documents, does not have legal effect.

Since 2006, urged by the State Administration of Cultural Heritage, some local governments, such as Shanghai and Beijing, formulated specific measures for the industrial heritage in the basis of local reality, and identified some industrial heritage

[56] http://www.ncpe.us/wp-content/uploads/2013/01/Campagnol_OffprintPERvol4.pdf
[57] Liu Boying, "Roundup of the Development of Industrial Building Heritage Conservation," *Architectural Journal*, 1 (2012), pp.12–17.

which is relatively more valuable as protection unite. Another new trend since then was that there was more and more industrial heritage in modern and contemporary time in the list of protection as cultural relics at the national level. From the first batch of *Major Sites Protected* for *their Historical and Cultural Value at the National Level* published in 1961 to the sixth batch in 2006, there are 2,377 sites protected at the national level have been designated (Table 1-1). Among those, in a broad sense, there are about 161 industrial heritage. However, the majority are originated in pre-industrial era before 1860, and there are only 11 industrial heritage in modern and contemporary time after 1860. The industrial heritage in modern and contemporary time were first listed in the 5th batch of Major Historical and Cultural Site Protected at the National Level (2001), including-the first oil refinery and the first nuclear weapons research establishment. Subsequently, in 2006, nine industrial properties, including some factories, engineering project and transportation hubs, listed in the 6th batch of Major Historical and Cultural Site Protected at the National Level. (Table 1-2)

LIST NO.	Date of Announce	Total number	Industrial Heritage number	%
1	03/04 1961	179	11	6.15
2	02/24/1982	62	7	1.13
3	01/13/1988	285	20	7.02
4	11/201996	250	18	7.20
5	06/25/2001	521	37	7.10
6	06/02/2006	1080	68	6.30
		2377	161	6.77

Table 1-1 The Number of Industrial Heritage Properties (including industrial relics originated from pre-industrial era) in the Chinese Major Sites Protected for their Historical and Cultural Value at the National Level from1961 to 2006. (Source: Que Weimin, "Industrial Heritage in China -It's Past, Present and the Future," in *The TICCIH Seminar on Training and Education within the Field of Industrial Heritage*, 2008, pp. 1–9.)

Name of Sites	Location	Year of Construction	Year of Declaration	Main Values (peculiarities)
The first oil refinery	Daqing,Heilongjiang Province	1958	2001	Historic value:Significant to the energy demand of China with its long term high yields;
The first nuclear weapons research establishment	Qinghai Province	1957	2001	Historic value: production of the first atomic bomb and the first Hydrogen bomb in China
The Ta Sheng Cotton Mill	Nantong,jiangsu Province	1895	2006	Historic value :built by one of the leaders of private enterprise ; As a typical factory of national modern industry
The Central-Asia Railway Complex,	Harbin,Heilongjiang Province	1898	2006	Historic and architectural values:
The original building of the Tsingtao Brewery	Qingdao,shandong Province	1903	2006	Historic, technology and architectural values: China's first beer factory that built by German beer company ;Jugendstil style, red brick building
The first site of the Hanyang-Daye-Pingxiang joint coal and iron plant	Huangshi, Hubei province	1908	2006	Historic, technology and architectural values:built by famous Chinese enterprises ;the largest and most advanced plant of coal and iron at that time.)
Shilongba hydropower	Kunming, Yunnan Province	1910	2006	Historic and technology values:built by famous Chinese enterprises; the first hydropower project in China
Jijie Street Railway Station	Gejiu,Yunnan Province	1915	2006	Historic value :As testimony of the Chinese enterprise against the economical

				invasion of imperialist countries ; a significant relic for the study of Chinese railway history.
Qingtang River Bridge	Hangzhou, Zhejiang Province	1934 - 1937	2006	Historic and technology values: China's first self-designed and self-built bridge; the first modern double - layer bridge in the country.
Huangya Cave Munitions Factory	Licheng,Shanxi Province	1939	2006	Historic values: built by the Eighth Route Army for the production of rifles, grenades and bomb
Jiuquan Satellite Launching Complex	Jiuquan,Ganshu province	1958	2006	Historic and technology values: the first missile test area in China

Table 1-2 Industrial Heritage Properties Declared as Chinese Major Sites Protected for their Historical and Cultural Value at the National Level from1961 to 2006 (not including industrial relics originated from pre-industrial era). (Source: by author)

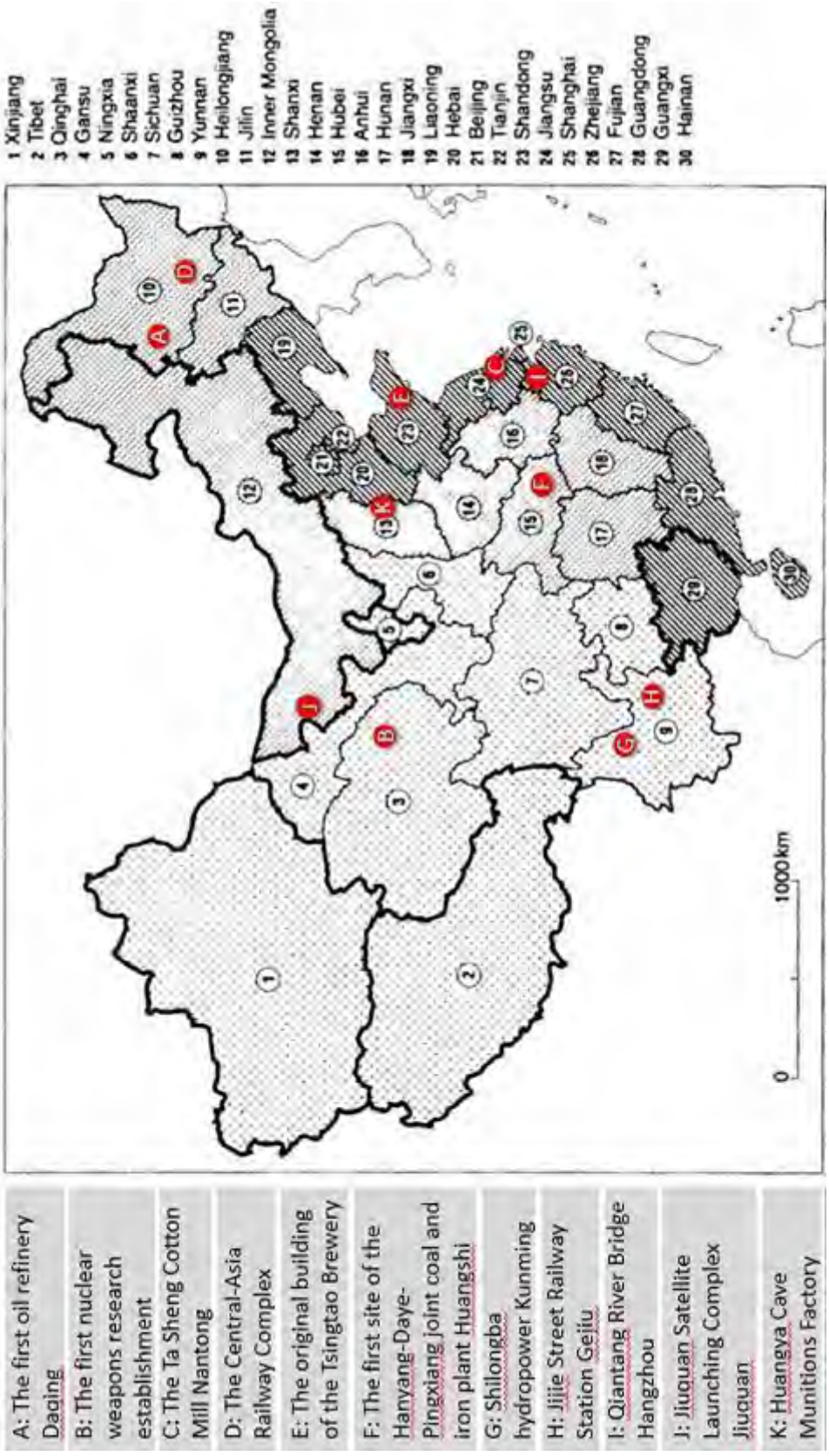

Figure 1-6 Map of Industrial Heritage Properties Declared as Chinese Major Sites Protected for their Historical and Cultural Value at the National Level from1961 to 2006 （Source：by author）

Figure 1-7 Daqing Oilfield ,one of the richest oilfields in china，is very significant to the energy demand of China with its long term high yields. The first oil well in Daqing has been appointed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2001. Now it became a place for science and history education. (Source: http://www.dqdt.gov.cn）

Figure 1-8 The first nuclear weapons research establishment in Qinghai Province was built in 1957. It had great contribution for the study on hydrogen bomb and atomic bombs. Because of its Historic value, it was listed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2001. (Source: http://www.ctpn.cn/bbs/thread-116957-1-1.html)

Figure 1-9 The Ta Sheng Cotton Mill in Nantong was built by Zhang Jian, one of the leaders of private enterprise at the end of 19th century. As a typical factory the development of national modern industry in China, it has been appointed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2006, including the original bell tower, workshops designed by American architect, official and residential buildings. Now the whole area is being transformed in to a creative park.（Source: http://www.ntda.gov.cn）

Figure 1-10 The construction of the Central-Asia Railway (Chinese Eastern Railway) was started in August 1898. The headquarters of the railway centered in Harbin, and spread into east, west and south lines, with overall 2500 km length. The complex of the Central-Asia Railwayhas been cited as key national heritage sites in 2006, including the virgin Church in Hengdaohezi, the locomotive garage and other Russian-style official and residential buildings. (Source: Provided by Harbin Institute of Technology, China)

Figure 1-11 Tsingtao (now Qingdao) Brewery is China's first beer factory that built by German beer company in 1903. The early buildings of the Tsingtao Brewery have been appointed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2006. Now this Jugendstil style, red brick building is re-used as Qingdao Brewery museum to present the production of beers together with other factory buildings in use. (Source: http://www.tsingtaomuseum.com)

Figure 1-12 In 1908, the Hanyang Ironworks of Hankou, the Daye iron mines, and the coal mines at Pingxiang in Jiangxi province were incorporated into a single concern, the Han-Ye-Ping Iron and Coal Company, which became the largest and most advanced plant of coal and iron at that time. The former site of the Hanyang-Daye-Pingxiang joint plant of coal and ironhas been appointed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2006, including the blast furnace, metallurgical furnace, observation tower, Japan-style buildings and European-style buildings. Now the whole site is in conservation, while the buildings are renovated as showroom and offices. (Source: http://www.hsdcw.com/html/2010-7-27/283321.htm)

Figure 1-13 Shilongba hydropower, built by Chinese enterprisers in the year of 1910 and equipped two Siemens motors, is the first hydropower project in China. It has been appointed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2006, including the dam, offices, residential buildings and the machines. Now some buildings are renovated as part of a hydropower museum. (Source: http://yn.zwbk.org/lemma/3801)

Figure 1-14 Jijie Street Railway Station in Gejiu,Yunnan province was built in 1915. It is not only the testimony of the Chinese enterprise against the economical invasion of imperialist countries in the beginning of 20th century, but also a significant relic for the study of Chinese railway history. It has been appointed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2006, including the station, waiting rooms, storage rooms, repair workshops and tracks. Now it is well protected. (Source: http://www.9i5c.com)

Figure 1-15 The Qingtang River Bridge, designed by the famous Chinese bridge engineer Mao Yisheng, was built from 1934 to 1937. It is not only China's first self-designed and self-built bridge to span across a distance 1453 meters ,but also the first modern double - layer bridge in the country. It has been appointed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2006. Now the bridge is still in use without trucks. (Source: http://www.nipic.com/show/1/48/6971194k92b7f492.html)

Figure 1-16 Huangya Cave Munitions Factory was built by the Eighth Route Army for the production of rifles, grenades and bomb in 1939. It has been appointed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2006. Now it is renovated as the historical representation of the production and a place for education in patriotism. （ Source: http://culture.people.com.cn/BIG5/106905/17767402.html）

Figure 1-17 Jiuquan Satellite Launching Complex, founded in 1958, is the first of China's three space vehicle launch facilities (spaceports). Because of its Historic value, it was listed as Major Sites Protected for their Historical and Cultural Value at the National Level in 2006. (Source: http://www.hnr.cn/news/tppd/tpxw/201306/t20130609_476787.html)

The criterion for the assessment of industrial heritage has not been established yet, therefore, the selection of these units is according to the criterion based on the standard of cultural relics protection units. It can be found that they all have one or more following characteristics:

1. It was associated with the major historical or political events in our country;
2. It marked the beginning of a new industrial category in our country.
3. The scale and technology once dominated in the same industry and represented the advanced level of China at that time;
4. It once had significant technical or management innovation in the production at that time;
5. It had promoted local economic growth and had a profound impact in urbanization;
6. It reflected particular aesthetic tendency of industrial production during that period.

Among these 11 industrial heritage properties, 8 sites are oriented from modern time between 1860-1949. The other 3 sites (The first oil refinery, The first nuclear weapons research establishment and Jiuquan Satellite Launching Complex) were built in contemporary time. The majority of them are recognized with their great historical and technology significance, while there are only a few selected because of architectural values. (Table 1-2)

Comparing with the number of other cultural relics which have been listed as protection units, the quantity of industrial heritage in modern and contemporary time is relative small. This situation resulted large quantity of industrial heritage without any protection. The phenomenon also reflected the ignoring of the modern and contemporary cultural heritage in the protection. It is more vulnerable to be under the threat of demolition than the cultural heritage in ancient time. In 2008, the cultural heritage of 20th century, mainly referred to "buildings, facilities and cultural landscape with less than 50 years of history", was emphasized in the *Wuxi Decoration*[58] . It means the range of cultural heritage has been extending to relatively recent years.

The modern and contemporary cultural heritage has been gained more attention. This decoration pointed out there are some existing problems on the protection of cultural heritage of 20th century, which also includes industrial heritages. These problems include lacking of protection awareness; the unreasonable city renewal and the barbaric demolition; lacking of legal protection; lacking of standards of identification; lacking of mature experience for protection implementation; lacking of definition of rational utilization way. On the baseline of these analysis, the *Wuxi Decoration* proposed to carry out the census and assessment work of the cultural heritages of 20th century. Subsequently, during the third time national cultural relics census from 2007 to 2011, the Ministry of Culture for the first time set the industrial heritage as an independent theme to investigate.[59] In the 7th batch of *Major Historical and Cultural Site Protected at the National Level* released in 2013, the number of industrial heritage is over one hundred. Some industrial heritages with great significance in modern and contemporary but ignored in the former six batches were also listed.

In 2010, the first academic symposium of China industrial architectural heritage was held in Beijing and the *Beijing Initiative* - Saving Industrial Heritage: on China's industrial building heritage protection initiative- *was adopted*. Meanwhile, the *Architectural Society of China* established the *Industrial Architecture Heritage Academic Committee* (IAHAC), which became the first academic organization for industrial heritage preservation in China. Following the *Nizhny Tagil Charter* and *Wuxi Recommendation*, Chinese scholars have started to carry out the study of industrial heritage with its own industrial development history as the reference system, construct value assessment system and definition standard based on the characteristics of Chinese industrial heritages.

1.5 A Necessary Transformation: From Protection to Reuse

As was stated above, regarding the formulation of the regulations for the industrial heritage, it is still at the beginning period in China. For the approach of protection, the current dominant view is to get the industrial heritage be included in the cultural heritage protection system. Specifically, it is to classify industrial heritage into different

[58] In April 2008, the Chinese Cultural Heritage Protection Forum on the topic of "The Heritage Protection of 20th Century" was held in Wuxi. The *Wuxi Decoration on Heritage Protection in 20th Century* has been adopted.
[59] In the Interim Measures for the Identification and Management of the Cultural Heritage issued by Ministry of Culture in 2009, it took the vernacular architecture, industrial heritage, agricultural heritage, cultural route, cultural landscape and other special type into the category of cultural relics protection for the first time.

protection levels based on the value as well as importance. However, this share management tool with cultural relics brought out some inevitable problems.

Due to the absence of own management system, it is necessary to develop new methods to deal with the industrial heritage in the aim of getting out of this dilemma. On one hand, in order to protect the industrial heritage with high values and significance, it should be identified and then listed as cultural relics protection units. At the same time, due to the classification of industrial heritage is not so detailed, the catalogues of industrial heritage need to be more variety. The conservation should be implemented at the different levels, including the industrial region and city, like Shenyang, Wuhan and Xi'an, industrial area and waterfront, like the Suzhou Creek waterfront in Shanghai, Shougang industrial area in Beijing, the coal mine subsidence area in Tangshan, and the individual industrial buildings. Except of these, the other type of industrial heritage, such as the Middle East railway industrial heritage near Harbin and the Beijing-Hangzhou Grand Canal heritage, are also deserved more attention and study. Further efforts should be focused in designating conservation area, drawing up conservation roster and ascertaining conservation grade.

Furthermore, with the consideration of international treaties and existing domestic laws and regulations, it is needed to develop specific laws and regulations for industrial heritage which are not listed in cultural relics protection units. Then the management of industrial heritage could be gradually separated from the cultural heritage protection system. Specific standards for the different categories of industrial heritage are needed. Take coal mine as an example, UNESCO puts forward the recognition criteria which is mainly suitable for coal mine industrial heritage ,including individual components, the whole mine field and even the landscape. It is a good reference for China, and most of these specific standards can be studied and then applied in our country.

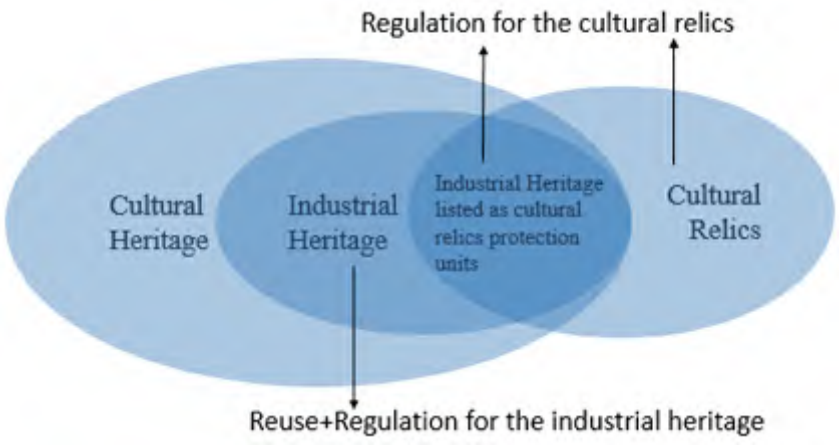

Figure 1-18 suggestion on the new management of industrial heritage (Source: by author)

On the other hand, besides industrial heritages with high heritage value, there are large quantity of “ordinary” industry heritage need to be management. The best way to protect them from demolition is to give them new life. In this sense, the industrial heritage itself need to be divided into different levels in the aim of using differentiated methodologies for the protection and reuse (Figure 1-18). The reuse methodology with various approaches are deserved to have a deeper study. Actually, encouraged by the successful experience in Shanghai and Beijing, many Chinese cities are exploring the reuse way for the industrial heritage, providing useful samples for the study of reuse methodologies.

Chapter 2 Exploring the Reuse Ways for Industrial Heritage in China

This part focuses on the reuse of industrial heritage in different Chinese cities. The main reason for such a regional perspective is that the practice of industrial heritage reuse has been largely a result of their unique history of industry development accompanied by the uneven regional culture and policies. With the different degree of urbanization in China, the reuse of industrial heritage started in the cities among the economic developed areas firstly, especially these metropolis developed fast and experienced great changes. As a result, a total of five cities (Figure 2-1) are selected in this chapter: two municipalities directly under the Central Government—Beijing and Shanghai, which are the biggest metropolis in China; another two cities in the eastern coastal region—Tianjin and Nanjing; and one city in the north-east region—Harbin, a representing city in traditional industrial base. Among them, Shanghai and Beijing, as the most developed cities with the problems resulted by de-industrialization, are in the leading position in term of industrial heritage reuse. Therefore, the analysis of Shanghai and Beijing comprises three parts respectively: a brief introduction of industrial development process, protection system and the reuse attempts of industrial heritage with diverse ways. The other three cities are read in a relatively simple way. By reading the different situations in these cities located in different regions, the big picture of industrial heritage reuse in China would be showed together.

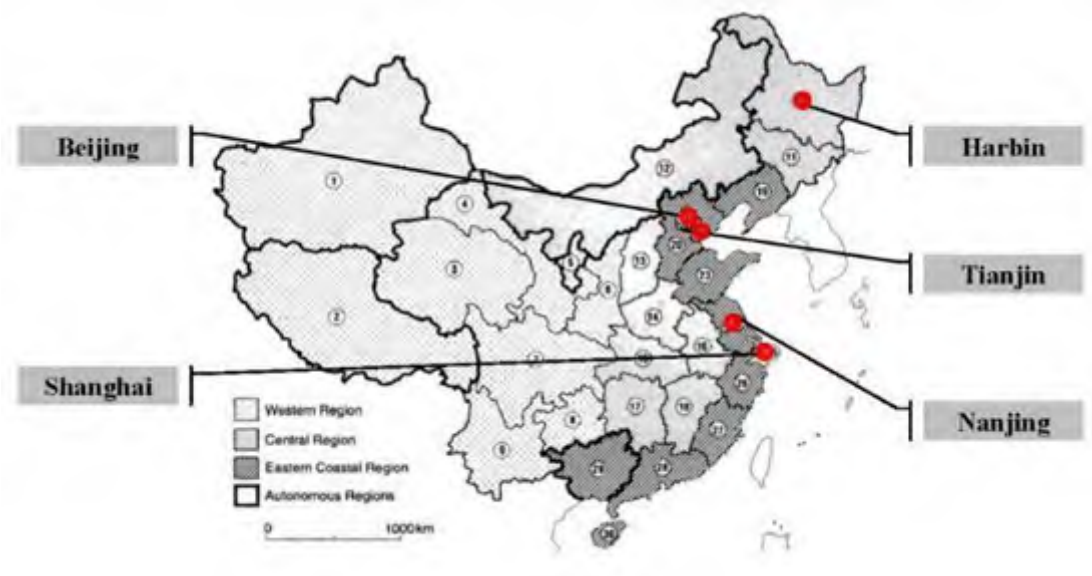

Figure 2-1 Map of China: the selected cities as cases in this chapter (Source: by author)

2.1 Shanghai: From Spontaneous Rehabilitation to Government Impetus

2.1.1 Background

As the largest industrial city in China, Shanghai [1] has been facing the deindustrialization since 1980s. The traditional industry areas in Shanghai had been profoundly affected by the economic conversion and industrial relocation. Since the early 1990s, as in other Chinese cities, an increase in land-use fees in the inner city has forced the relocation of manufacturing activities in the urban margin areas.[2] As a result, polluting and labor-intensive manufacturing industries were removed from the inner city, leaving a large quantity of empty industrial buildings and warehouses.[3] (Table 2-1)

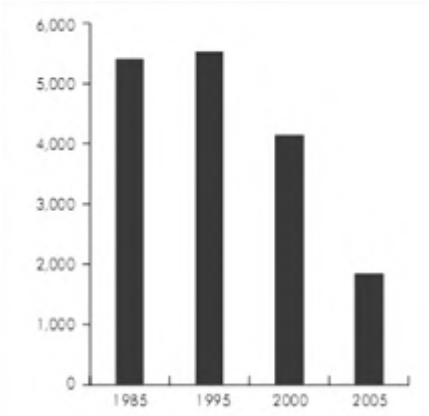

Table 2-1 Number of industrial enterprises in center Shanghai from 19885 to 2005 (Source: Kunyan Liu, "On the Waterfront: Recasting Shanghai's Industrial Heritage," CBRE Research Asia, 2007, 1–8.)

Regarding the industrial heritage in Shanghai, there are mainly three types in term of geographic distribution. First of all, along the Huangpu River and Suzhou Creek the industrial heritage with a continuous band distribution occupy a significant proportion. (Figure 2-2)The cheap and stable shipping is the basis of the establishment of industry. Many industrial activities are closely related with water. Therefore, Huangpu River and

[1] Because of its location, shanghai became a treaty port in 1843.By the 1930s, the number of factories in Shanghai had exceeded 50% of the total in China. In 1949, there were over 10,000 factories in Shanghai, making it the largest industrial city in China. From Song Zhang, "Conservation and Adaptive Reuse of Industrial Heritage in Shanghai," *Frontiers of Architecture and Civil Engineering in China*, 1 (2007), pp.481–490 <doi:10.1007/s11709-007-0065-4>.

[2] In 1990, 58 percent of Shanghai's industrial output was produced in the inner-city. To implement the new comprehensive metropolitan plan, a planning policy was proposed in the mid-1990s that permitted only one-third of the manufacturing enterprises that were compatible with functions of the inner-city to stay in the inner-city while one-third would be closed down due to poor performance and another one-third would be moved out of the inner-city to make room for tertiary sector activities. The majority of the relocated manufacturing enterprises were located in the margins. The relocation of manufacturing enterprises has reduced industrial pollution in the inner-city area. See more in Terry McGee and others, *China's Urban Space:Development under Market Socialism*, Taylor & F (Routledge, 2011), p. 284.

[3] According to the Shanghai Statistical Yearbook, there were 1,835 industrial enterprises in central Shanghai in 2005, a decrease of 67% from 1995. From Kunyan Liu, "On the Waterfront: Recasting Shanghai's Industrial Heritage," *CBRE Research Asia*, 2007, pp.1–8.

Suzhou Creek have become the axis and origin of the modern industrial development in Shanghai. There are a large number of shipbuilding factories, port machinery plants, military industries, dock storage, cotton mills, power stations, water plants and bulk plants, etc. gathering along Huangpu River (Figure 2-3). Meanwhile, there are a large amount of flour mills, cotton mills, etc. along Suzhou Creek. They usually belong to heavy industry, have a grand scale and multiple functions.

Second, many small-scale and scattered-unit traditional industry and neighborhood industry are distributed in the vast urban hinterland. They mostly are light industry, such as towel factory, glass factory, air gun factory, alcohol plant, tobacco company, etc. These traditional manual workshops, neighborhood industry buildings formed in planned economy era[4] have interlock distributions with the residences. They form the miscellaneous urban function space together. These industrial remains have uneven qualities and different styles. Some have broad storage yard and courtyard, while some are small, which all become the important objects in the process of renewal and reconstruction in the inner city.

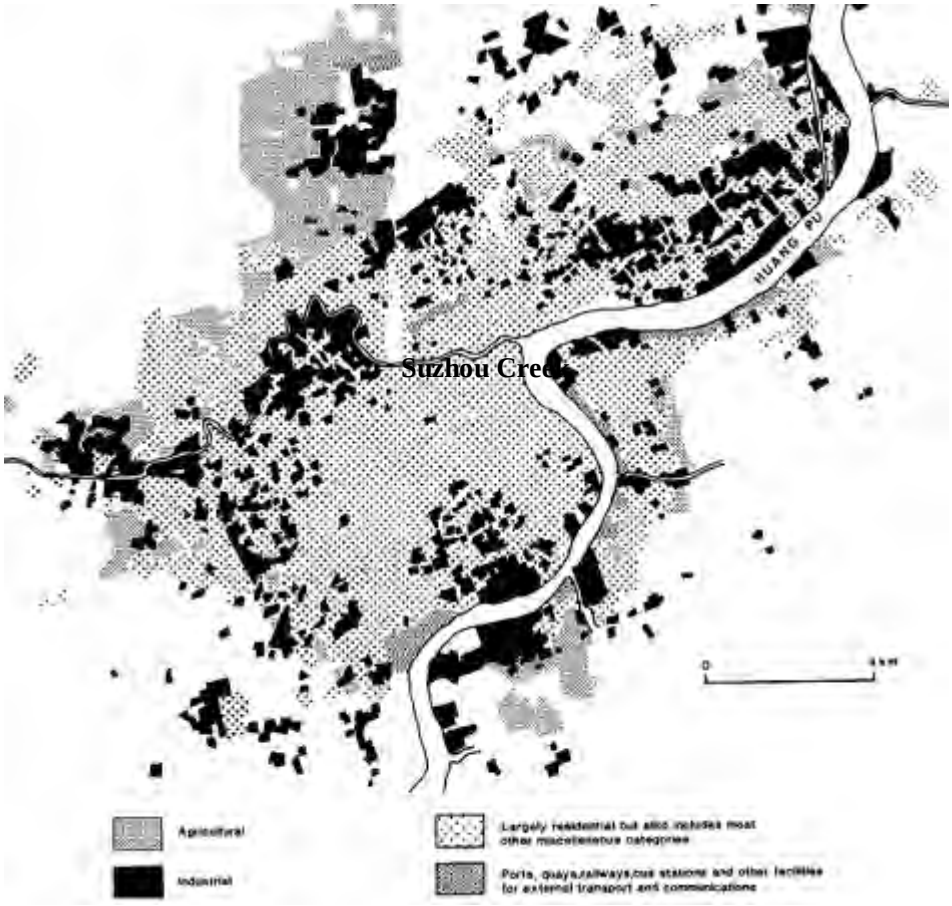

Figure 2-2 A simplified map of land use of Shanghai City Proper, 1985. (Source: adapted from materials given in The Atlas of Shanghai c. 1985, restricted publication, Rupert N. W. Hodder, "China's Industry: Horizontal Linkages in Shanghai," Transactions of the Institute of British Geographers, 15 (1990), pp. 487–503.)

[4] A planned economy is an economic system in which decisions regarding production and investment are embodied in a plan formulated by a central authority, usually by a public body such as a government agency. In china, the planned economy era is from 1949 to 1978.see more in http://en.wikipedia.org/wiki/Economy_of_China

Figure 2-3 different types of industrial heritage along Huangpu river (Source: Song Zhang and Li，Yuxin, "Exploring the Strategy of Integral Conservation Planning for Yangshupu District in Shanghai," ARCITECTURAL JOURNAL, 2012, 18–23.)

In addition, there are a number of large-scale national heavy chemical industries, for instance, Jinshan Petrochemical Plant, Baoshan Steel Plant in suburbs and satellite cities of Shanghai. These industrial areas still continue a certain proportion of industrial production. However, with the process of urbanization and adjustment of the urban function structure, they gradually become the factors which restrict the development of the city. These old industrial areas located in the suburbs often have difficulty in adjustment and transformation because of historical and institutional reasons. Now the protection and use of industrial heritage in Shanghai are mainly concentrated in central city.

2.1.2 Protection System for Industrial Heritage

Shanghai has not issued special laws and regulations for the protection of industrial heritage. Its protection is incorporated into cultural heritage protection system. According to *Law of the People's Republic of China on Protection of Cultural Relics*, the industrial heritage are incorporated into protection units for protection. On the local level, since the first batch of 62 cultural relics protection units was released in 1957, Shanghai has gradually developed its own system for cultural relics protection. The scope of historical protected objects has been expanded gradually from the sites oriented from revolution era and historical relics to modern cultural heritage, among which industrial heritage play a more important role.

In 1988, Shanghai conducted the investigation and recommendations work on modern architecture. Then 59 superior modern buildings were recommended as *Major Sites Protected for their Historical and Cultural Value at the National Level*, including two

industrial buildings: Yangshupu Water Plant (Figure 2-4;Figure 2-5) and the New Chinese Post-office(Figure 2-7). During this period, industrial heritage protection has not become the focus of the protection work. The two industrial buildings are in the list because they have very prominent architectural features and characteristics. At the same time, because of legal restrictions on the function use of cultural relics protection units, the two units have to expand appropriate exhibition function on the basis of the original functions to comply with the strict requirements of regulation. In addition to these two industrial buildings, most industrial buildings cannot reach the standard of cultural relics protection unit at that time in terms of architectural features and historical value.

Figure 2-4 the original appearance of Yangshupu Water Plant at the end of 19th century(Source: Zhang, Song, and Li， Yuxin, "Exploring the Strategy of Integral Conservation Planning for Yangshupu District in Shanghai," ARCITECTURAL JOURNAL, 2012, 18–23)

Figure 2-5 Yangshupu Water Plant, listed as Major Sites Protected for their Historical and Cultural Value at the National Level. It changes a shutdown workshop into Shanghai Tap Water Pavilion and other parts continue the previous function (Source: Zhang, Song, and Li， Yuxin, "Exploring the Strategy of Integral Conservation Planning for Yangshupu District in Shanghai," ARCITECTURAL JOURNAL, 2012, 18–23)

Figure 2-6 the original machines are well protected in Yangshupu Water Plant, (Source: Zhang, Song, and Li，Yuxin, "Exploring the Strategy of Integral Conservation Planning for Yangshupu District in Shanghai," ARCITECTURAL JOURNAL, 2012, 18–23)

Figure 2-7 New Chinese Post-office and Yangshupu Water Plant, listed as *Major Sites Protected for their Historical and Cultur*al Value at the National Level.(Source: http://zh.wikipedia.org/wiki)

Compared to other Chinese cities, Shanghai is one of the earliest cities to start industrial heritage protection and reuse on a large scale. In 1998, Shanghai Planning Bureau entrusted College of Architecture and Urban Planning Tongji University specially to carry out census work of outstanding industrial buildings in Shanghai after 1840. Through surveys, they found that, there were only 41 industrial buildings can be traced among 60 well-known old industrial buildings in documents and literature. In the research report of *Appraisal and Protection of Excellent Modem Industrial Buildings in Shanghai*, they proposed that 30 industrial heritage should be on the list of protection. In the end, 14 industrial heritage were listed on the third batch of *Shanghai Excellent Modem Buildings* issued by municipal government in 1999.

The *Administrative Measures for Shanghai Excellent Modem Buildings Protection*, which was implemented in 1992, is China's first local government law related to the protection of modern buildings and also the first local law for historical building protection in Shanghai. The concept of "*Excellent Modem Buildings*" means "constructions (including building groups) with historical, artistic and scientific value in Shanghai from 1840 to 1949".The protection of *Excellent Modem Buildings* can be divided into the following three levels: (1) Major Sites Protected for their Historical and Cultural Value at the National Level (2) Major Sites Protected for their Historical and Cultural Value at the Shanghai Level (3) Shanghai Architecture Protection Unit. The first two levels are protected according to *Law of the People's Republic of China on Protection of Cultural Relics*. The third level is managed by Shanghai related functional departments on the basis of careful investigation. These departments formulate the *Technological Specifications of the Conservation of Heritage Buildings*, which includes contents such as protection level, protection emphasis, protection measures, protection scope and construction control area, etc. as the main technical basis for daily management of the *Excellent Modem Buildings*.(Figure 2-8;Figure 2-9)

Original name	Name of the site in the year of registration	Current address	Floors of buildings
Ewo Cotton Spinning and Weaving Co.	No.5 Shanghai Spinning and Weaving Co.	670 Yangshupu Rd	3/2/2/1/2
Structural type	Building period	Architect/contractor	Original use/current use
Brick and wood/reinforced concrete frame for the big warehouse	1909~1941	Moorhead & Halse	Industry/industry
Conservation category	IV/III		
Conservation area	Site area		
Building control area	North borderline upto Yangshupu Rd, south 10m away from the buildings, east 2-30m away from the buildings and west upto the borderline of the factory.		
Conservation focus and instructions	Serrated roof, facades and lantern		
Conservation focus and instructions for interiors			
Instructions for change of use, or relocation			
Other instructions and suggestions for conservation			
Descriptions of the buildings	Reinforced concrete serrated roof with cement facade. The height-width ratio for windows is close to 2, with arches on the top or iron serrated roof with a lantern at centre. / The height-width ratio for windows is close to ½, arches atop the windows. / Brick-wood structure, architectural style is close to English country house. / The reinforced concrete serrated roof is among the earliest in China which applied reinforced concrete structure. Bare red brick with pillars within the wall, doors and windows with a slender ratio and arranged in rhythm. Though there is no specific decoration attached to wall, pillars, doors and windows, the facade re- mains demure and harmonious in terms of colour combination and pro- portion. / Bare red brick facade.		

Figure 2-8 A table compiled according to the Technological specifications of the conservation of heritage buildings (Source: Song Zhang, "Conservation and Adaptive Reuse of Industrial Heritage in Shanghai," Frontiers of Architecture and Civil Engineering in China, 1 (2007), 481–490 <doi:10.1007/s11709-007-0065-4>.)

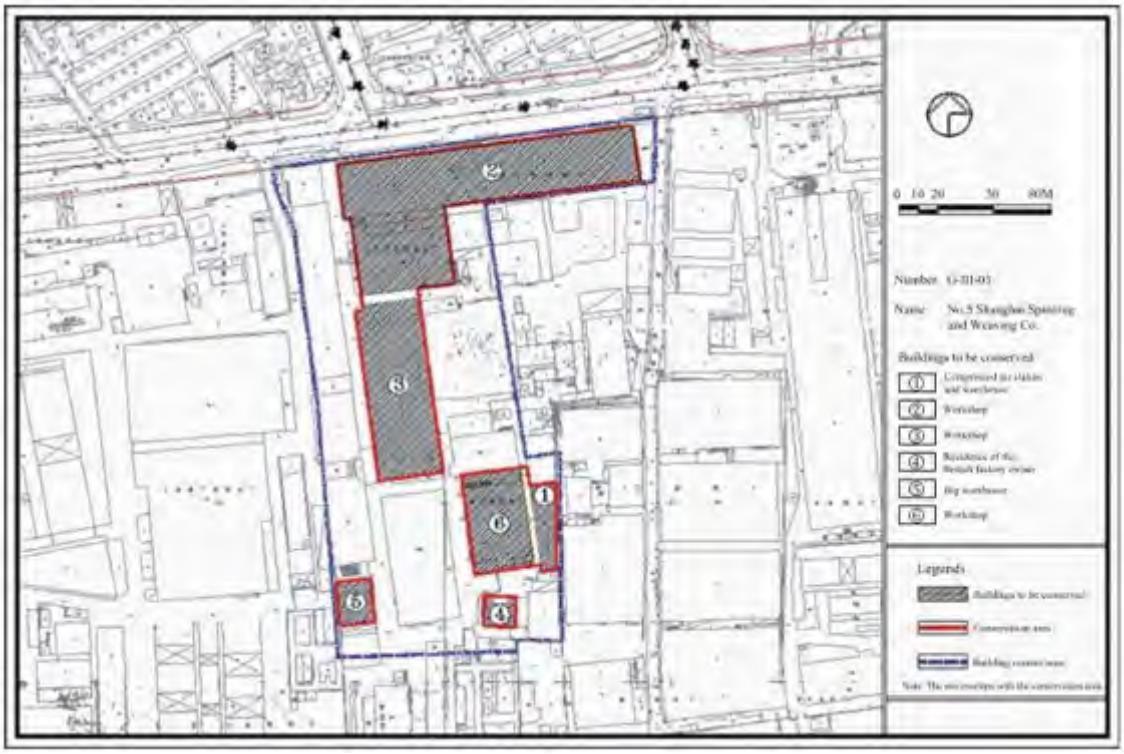

Figure 2-9 A statutory plan compiled according to the technological specifications of the conservation of heritage buildings(Source: Zhang, Song, "Conservation and Adaptive Reuse of Industrial Heritage in Shanghai," Frontiers of Architecture and Civil Engineering in China, 1 (2007), 481–490)

By 2005, Shanghai has gradually unveiled four batches of *the Excellent Modem Buildings* respectively in 1989, 1993, 1999, and 2004. There are different categories such as shipbuilding, post and telecommunications, light industry and textile, etc. Industrial heritage with typical historical, artistic and scientific value fall under the protection with the increasing proportion year by year (Table 2-2). Besides the protection of individual buildings, the municipal government list 1 km road along Suzhou Creek in the protection list of industrial building in 2004.

Year of registration	1989	1993	1999	2004	Total
Total number of heritage buildings	61	175	162	234	632
Number of Industrial heritage	2	12	16	13	43
Percentage	3.28%	6.86%	9.88%	5.56%	6.80%

Table 2-2 Percentage of Industrial Heritage Sites in the list of Shanghai Excellent Modem Buildings (Source: Zhang, Song, "Conservation and Adaptive Reuse of Industrial Heritage in Shanghai," Frontiers of Architecture and Civil Engineering in China, 1 (2007), 481–490)

In 2003, Shanghai began to implement *Regulations of Shanghai Municipality on The Protection of The Areas with Historical Cultural Features and the Excellent Historical Buildings*. The "*Excellent Modem Buildings*" was replaced by "*Excellent Historical Buildings*". This was the first time to put forward the protection of industrial buildings clearly at level of law in China:

A building more than 30 years old and with one of the following conditions may be defined as an excellent historical building:

(1) The architectural styles, construction techniques and construction technologies contain features of architectural art and value of scientific research;

(2) Reflecting historical cultural features of Shanghai's regional architecture;

(3) Representative works of renowned architects;

(4) Workshops, stores, factory buildings and warehouses that are representative in history of our country's industrial development;

(5) Other excellent historical buildings that have a historical cultural significance.

This is also the first time for historical building protection laws and regulations to classify transformation and development measures of protection building in domestic.

According to the historical, scientific and artistic value of the building and its extent of good condition, the requirements for protecting excellent historical buildings are divided into the following four categories[5]:

(1) The elevation, structural system, plane layout and internal decoration of the building shall not be changed;

(2) The elevation, structural system, basic plane layout and internal decoration with characteristics of the building shall not be changed, but the other parts may be changed;

(3) The elevation and structural system of the building shall not be changed, but the internal parts of the building may be changed;

(4) The main elevation of the building shall not be changed, but the other parts may be changed.

These regulations make *Excellent Historical Buildings* including industrial buildings often have strict limits on the transformation. The majority listed industrial buildings are divided into the *(3)* and the *(4)* category. Only a small amount is divided into the *(2)* category. In the protection and transformation, the basic methods of the industrial buildings approved and supported by the government are the external facade cleaning to restore historical appearance and cleaning, recovery, reinforcement for the internal structure. The transformation methods for industrial buildings not included in the protection list are more flexible and generally according to the requirements of the owner and the designer's creativity. Therefore, they have a variety of expressions and means. Depending on different purposes and development patterns, their internal structures also tend to have larger changes, or even completely reconstructed.

With more extension and deepening of the relevant provisions about the industrial heritage, it has been developed into a more and more important role in Shanghai historical and cultural landscape protection system. The *Notice on Strengthening the Protection of The Areas with Historical Cultural Features and the Excellent Historical Buildings* issued in 2004 requires clearly "all the buildings built before 1949 and representing industrial buildings, shops, warehouse, workshop, and bridge and other buildings of different historical periods and buildings which are built more than 30 years and consistent with the excellent buildings must be properly protected". The *Suggestions on Strengthening Management of Planning and Regulations on Transforming the Nature of the Premises of Buildings* issued in February 2006 strictly controled the further reuse direction of history protection architecture, which cannot be easily changed. In 2009, Shanghai cultural relics administrative department sorted out more than 250 industrial heritage after investigation, registered and cataloged, which marked for the first time industrial heritage protection as a special type of urban heritage protection. In the same year, in order to establish a complete dynamic monitoring system of industrial heritage protection, Shanghai made the T*echnical Specification for the Industrial Heritage Protection and Monitoring*. Through technical means, it ensured the safety of industrial heritage and improved the ability of

[5] The municipal administrative department of housing and land shall, jointly with the municipal administrative department of planning, propose the specific requirements for protecting excellent historical buildings at each place, and after appraisal by the specialists committee, report to the Municipal People's Government for approval. See more in Article 25 of *Regulations of Shanghai Municipality on The Protection of The Areas with Historical Cultural Features and the Excellent Historical Buildings*.

emergency preparedness and exerted the supervision by the media and the public. At present, Shanghai municipal government is formulating the special policy of *Measures on Sha*nghai *Industrial Heritage Protection* to gradually improve a scientific system of industrial heritage protection and reuse.

Figure 2-10 The location of typical cases of industrial heritage protection and reuse in Shanghai (Source: by author)

2.1.3 Evolvement of Reuse Ways

As the industrial heritage play a clearer role in Shanghai historical buildings protection system, introducing reasonable new function for them has become the core problem of protection. Shanghai's reuse practice is a process of constant evolution. According to different reuse patterns, they generally can be divided into four stages as following.

2.1.3.1 Coexistence of museum-style protection and spontaneous reuse

Among the first batch of 59 Excellent Historical Buildings, there were two industrial buildings: the New Chinese Post-office and Yangshupu Water Plant, listed as *Major Sites Protected for their Historical and Cultural Value at the National Level*. Under the requirement of "do not change the use" in the law of cultural relics, they and other cultural relics protection units have more stringent protection requirements and adopt measures of museum-style protection[6] . Part of the first floor and second floor in New Chinese Post-office was transformed as postal museum, and the rest was still used as office buildings; Yangshupu Water Plant changed a shutdown workshop into Shanghai Tap Water Pavilion and other parts continue the previous function.(Figure 2-5; Figure 2-6)

[6] CHEN Peng and HU Lili, "The Conservation and Reuse Strategies for the Industry Heritages in Shanghai," *Shanghai Urban Planning*, 01 (2013), 16–22.

During this period, the consciousness of protection and reuse of the industrial buildings was still very weak. Even the industrial heritage which were listed as *Excellent Historical Buildings* often had the risk of damage. A typical case is the Shanghai Brewery (Figure 2-11). It was one of the largest beer manufacturers in the 1930s in the Far East, located in the western section of Suzhou Creek and covered an area of 8.6 ha. The building complex was designed by Hungarian architect Lazlo Hudec in 1933 and completed in 1934. In 1999, its office building, filling workshop and brewing workshop were listed in the third batch of *Excellent Historical Buildings* in Shanghai. The protection level was municipal level and the protection requirements were: office building is in the (2) category; Filling workshop and brewing workshop is in the (3) category.[7]

At that time, Suzhou Creek alongside was conducted an environmental improving during 1999 to 2002. After the work was completed, some part of Suzhou Creek south part was planned to build into ecological garden "Meng Qing Garden" and Shanghai Brewery would have been totally removed. The plan soon took action until refrain from Shanghai Municipal Planning Bureau. Then in the early 2003, several studies and discussions on Meng Qing Garden planning were conducted by relevant experts and scholars, under the organization of Shanghai Municipal Planning Bureau. The focus was on the protection of Shanghai Brewery buildings and the construction of the garden. At that moment, only the office building, bottling workshop and wine-making workshop of Shanghai Brewery were remained while all the other buildings were demolished. The wine-making building has been demolished from nine-floor to five-floor and the main structure has been cracked and was very precarious. The people advocating the removal were mainly based on three considerations: Firstly, the removal of Shanghai Brewery buildings can greatly increase green area as the government has invested a lot of funds for ecological green park construction; secondly, the huge Brewery buildings hindered the sight of the landscape; thirdly, as an industrial building in a modern style, the building destroyed the landscape effect of Meng Qing Garden. The final decision was a relatively eclectic choice: protectively repairing and reusing the bottling workshop and part of the wine-making workshop. Specifically, the main part of the bottling workshop has been remained and its inside and outside part have been repaired to use as exhibition center; the most part of the wine-making workshop has been demolished and only the side of the Suzhou Creek left, transformed to beer-themed bar; the office building was left for further consideration in the future.(Figure 2-13)

[7] HUANG Yi-ru and MAO Wei, "Between Demolition and Conservation:Review of the Conservation of the Workshops in Union Brewery Ltd.Shanghai," *TIME+ARCHITECTURE*, 02 (2006), 88–93.

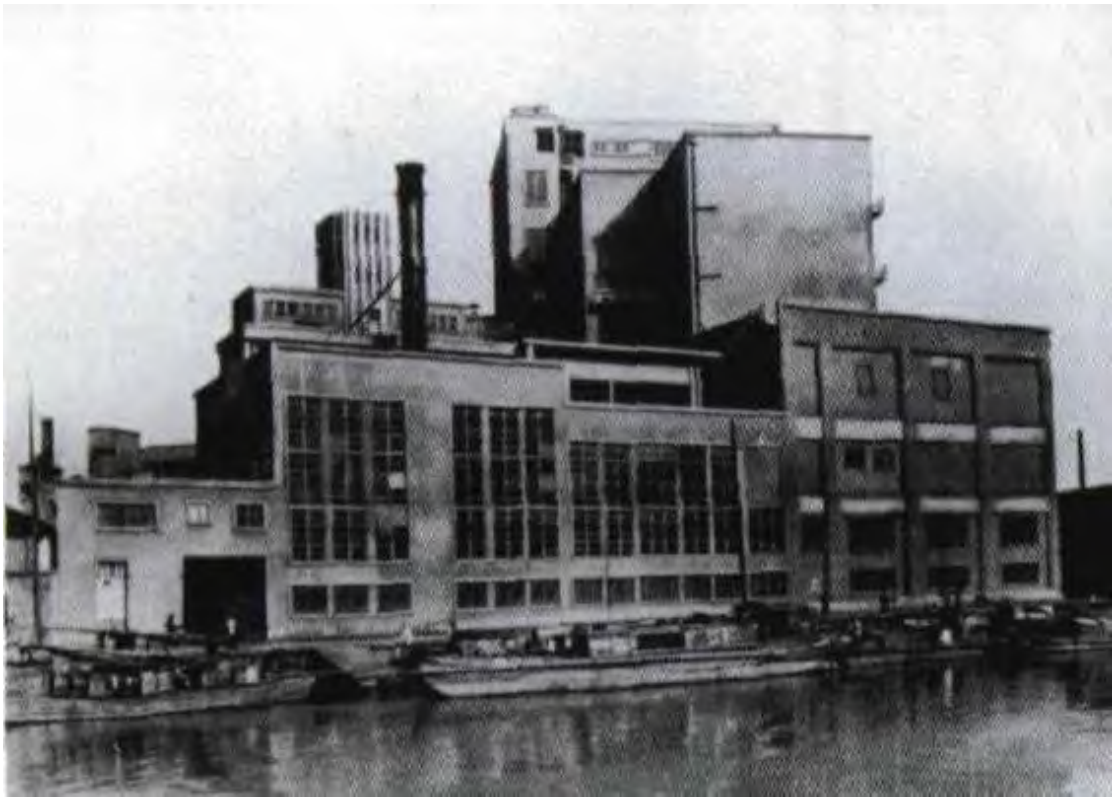

Figure 2-11 The original building of shanghai beer factory along the Suzhou Creek (Source: Yi-ru, HUANG, and MAO Wei, “Between Demolition and Conservation:Review of the Conservation of the Workshops in Union Brewery Ltd.Shanghai,” TIME+ARCHITECTURE, 02 (2006), 88–93)

Figure 2-12 General view of the renovated brewing building，now beer bar(Source: Yi-ru, HUANG, and MAO Wei, “Between Demolition and Conservation:Review of the Conservation of the Workshops in Union Brewery Ltd.Shanghai,” TIME+ARCHITECTURE, 02 (2006), 88–93)

Figure 2-13 The renovated filling building，now exhibition center(Source: Yi-ru, HUANG, and MAO Wei, "Between Demolition and Conservation:Review of the Conservation of the Workshops in Union Brewery Ltd.Shanghai," TIME+ARCHITECTURE, 02 (2006), 88–93)

In this period, Shanghai industrial transformation had been carried out step by step; many factories became empty. In order to save themselves, the companies began to develop and rent the idle workshops spontaneously in the name of developing tertiary industry. The major reuse directions were furniture-sell space and building materials market which have lager requirements on the internal space, or the workshops that were rent after internal space division for dining and entertainment. Although the reuse of industrial buildings started, due to the protection of industrial buildings have not been considered seriously, these relatively simple utilization patterns lacked effective guidance, which did damages to the original character and architectural features of industrial building.

2.1.3.2 Spontaneous reuse initiated by artists

Apart from delimiting the *Excellent Historical Buildings* to protect prominent industrial heritage, in the late 1990 s, spontaneous protecting and reuse idle industrial heritage in central city were driven on by some artists through establishing the artist studio. With large volume, high story height, large span and internal spaces which are easy to divide, they conform to the artists' functional requirements for creation and exhibition. At the same time, the reinforced concrete building materials, well-preserved ventilation equipment, drainage pipelines and all kinds of production equipment make the factory full of modernist characteristics and the elements of nostalgia, which often are very popular with artists. The relatively cheap rent has become another important reason to attract artists. For these reasons, in the center city of Shanghai, artists began to

transform the abandoned industrial buildings to SoHo[8] type studio and loft, etc. In 1998, Taiwan designer Deng Kunyan first entered the warehouse along Suzhou Creek in Shanghai and reinterpret old warehouse successfully[9]. Inspired by him, a group of artists set up their own studios in warehouses. However, for lack of policy guidance and specifications, these reuses of industrial buildings were limited to simple modification of internal space on the premise of ensuring the safety of building structure. These practices have become the prototypes for a large number of industrial buildings transforming to the *Creative Industrial Agglomeration Area*[10], which is the basis of industrial heritage reuse way promoted by Shanghai municipal government.

Figure 2-14 the art studio of Taiwan designer Deng Kunyan in the warehouse along Suzhou Creek in Shanghai（Source: http://img.blog.163.com/photo/nCHyjX8lkKTZyakGlLfl-A==/2578873736623732225.jpg）

[8] SoHo, is a neighborhood in Lower Manhattan, New York City, notable for being the location of many artists' lofts and art galleries, and for the wide variety of stores and shops ranging from trendy boutiques to outlets of upscale national and international chain stores. See more in http://en.wikipedia.org/wiki/SoHo,_Manhattan

[9] Kunyan Liu, "On the Waterfront: Recasting Shanghai's Industrial Heritage," CBRE Research Asia, 2007, pp. 1–8.

[10]The feature of these zones is "the regeneration of old factory buildings and the conversion of these buildings into the new studio, office or retail uses.…the varying degrees of agglomeration of artists and creative enterprises in these zones and this generates rent profits, local taxes and stimulates cultural and creative industries" see more in Jane Zheng and Desmond Hui, "Making Creative Industry Parks in Shanghai: The Urban Regime and The 'Creative Class,'" *Development*, 2005, pp. 1–21.p.3.

2.1.3.3 Reuse as Creative Industrial Agglomeration Area

Since the beginning of 2000s, on the basis of the transforming factories and warehouses as studios by artists, the protection and utilization of industrial heritage drew great attention from all quarters of the society. More dismissed industrial areas were taken for *Creative Industrial Agglomeration Area*, which was a zone that restores and reuses industrial legacies, proposing to accommodate creativity-based firms. The Shanghai Creative Industry Center[11] was established in 2004 to promote the creative industries at the city level. With the governmental promotion and public-private cooperation[12], the creative industry is developed with the support of reuse of industrial buildings. There are many cases, such as like M50, No. 8 Bridge, etc.

No.50 Moganshan Road is located at the middle of the southern bank of Suzhou Creek. (Figure 2-15) As the center of national capital enterprises in Shanghai, it preserved old factory building from 1930s to 1990s. Chunming Woolen Factory was the best preserved textile industrial building complex along Suzhou Creek. Due to the economic decline, it was shut down in 1999. It hoped to solve the follow-up problems and laid-off workers through rent. At this time, some artists felt satisfied with this factory and rented the plant as studios. For the spacious inner space, the first group of artists usually created for their large works, such as paintings, iron art, sculpture, etc. Then No.50 Moganshan Road attracted more art creators for these artists. For this reason, the factory also transformed from the original complex with rental business management into a *Creative Industrial Agglomeration Area*, named M50[13].

In view of the management and maintenance, there are several feasible measures deserve to point out: first, on the basis of original warehouses, part of the building should be repaired and maintained. The lessees' renovation must be checked by the manufacturer and shall not damage the building appearance; second, with the management of the art organizations and artists, artistic atmosphere here is improved through the creation activities and quality control. Third, to provide the artists who enjoy the fame but have difficulty financial assistance. All these change the past simple relationship between tenants and landlord. On one hand, the manager support artists to survive here, on the other hand, they maintain the original form of M50 and let the artists not be eliminated along with the ascension of the rent.(Figure 2-16;Figure 2-17)

During the same period, Shanghai municipal government gradually attached great importance to the protection of historic buildings. Chunming Woolen Factory was also listed as *Excellent Historical Building* because of the historical value of the Shanghai textile industry. Regarding its development pattern, it viewed artists as the center and form spontaneously artistic atmosphere at the beginning, Then it drove other service

[11] A semi-governmental organization established under the municipal economic committee, one of its most influential measurements is designating the creative industry parks in Shanghai. From Zheng and Hui.pp.1-21.

[12] There are four kind of public-private cooperation: First, the district government, with the Industrial Bureau affiliated corporation as the representative, functioned as an advisor, guiding and assisting guided state-owned enterprises to tackle their economic crisis by developing office quarters. Second, some district governments directly participate in some projects, usually having one or more affiliated corporation 15 as shareholders. The district Industrial Bureau or Economic Committee affiliated corporation(s) align with other private developers and state-owned enterprises to set up a new company. Third, the cooperation between the public actor and the business sector (i.e. developers or properties) has evolved. Fourth, the local authority also attempts to promote "creative industries" and cultural and art activities. From Zheng and Hui, pp.1-21.

[13] In 2004, Chunming Woolen Factory was named as visual arts characteristic block; in 2005, it was awarded as Creative Industrial Agglomeration Area by Shanghai economic committee (first patch).see more in http://www.sheitc.gov.cn/

industries (for example, bookstores, coffee shops, art supplies store, etc) to enter. After the success of M50, many old industrial buildings and sites in Shanghai also followed this way of industrial substitution, which drove transformation from industrial workshops to Creative Industrial Agglomeration Area.

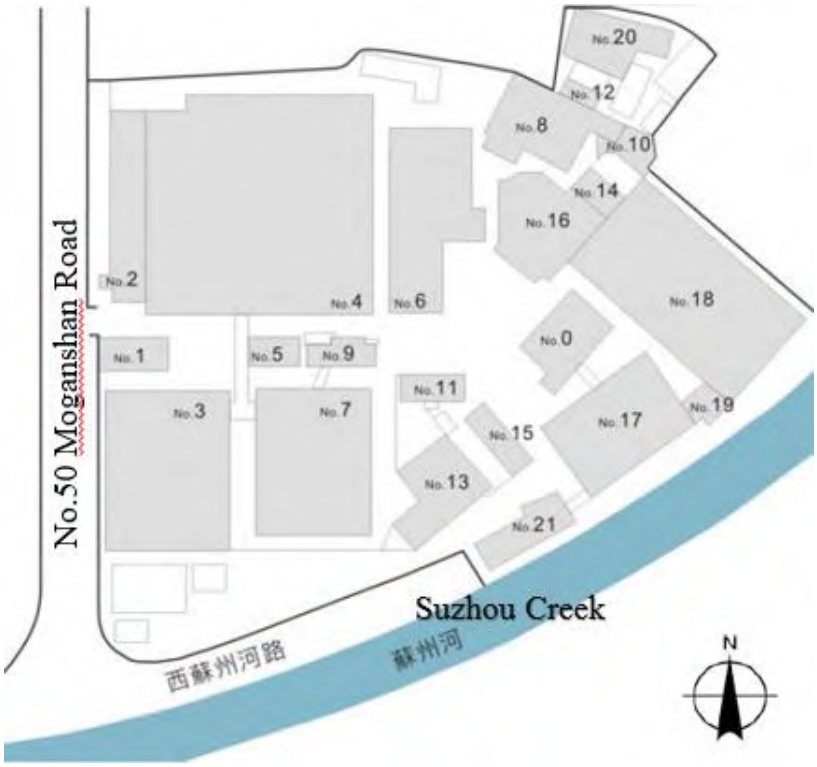

Figure 2-15 the layout of Chunming Woolen Factory (M50) in No.50 Moganshan Road,Shanghai （Source: Qianci, TONG, “The Spatial Mechanisms of Cultural Creative Industrial Development in Shanghai” (Ming Chuan University, 2009), pp. 1–126）

Figure 2-16 M50 on the bank of Suzhou Creek of Shanghai was originally a state-owned textile factory, and rebirthed after an increasing number of artists moved into these old factories. (Photo: by author)

Figure 2-17 Art studios in M50, Shanghai. (Photo: by author)

The Bridge 8 Creative Industrial Agglomeration Area[14] located in Luwan District, Shanghai was another successful case when creative industry was still in the bud. In this period, the call for protecting excellent modern buildings was high. At the same time, Shanghai real estate market was very hot. The land of city center was particularly valuable. Renovation of idle old buildings in central district was rare. In 2003, with the help of the Shanghai Economic and Trade Commission and Luqingwan district government, life style Centre Holdings Limited rent the right to use the Shanghai Automotive Brake Factory for 20 years. They invested to upgrade the hardware facilities and developed the old factory buildings into a commercial real estate project.(Figure 2-18)

The renovation of Bridge 8 had been divided into two phases. The first phase began in 2004 and was designed by Japanese architects. After transformation, there were 80% offices for rental and 20% dining and recreational facilities. The architects thought that the plant itself was not very distinctive but very common. Thus its transformation strategy was to maintain only its original structure. On the basis of original pillars and steel structure, they made full use of large span and large scale of the old workshops and putted emphasis on creating transparent and shared space. The architects also made glass louver for closed workshop and joined new functions such as business center, staff canteen, sun roof, small garden, etc. The second phase was started in 2006; the original state-owned metal processing factory was transformed into commercial and office space and increased the central square, where people can hold various public activities.(Figure 2-19;Figure 2-20) In this case, it can be seen that the transformation and renovation of old factory buildings replaced the previous way of dismantlement. With this kind of reuse, in a few years, they attracted large numbers of creative, artistic and fashionable enterprises at home and abroad. They not only retain part of the industrial buildings, but also obtain the huge commercial profits.

[14] In 2005, Shanghai Economic Committee awarded Bridge 8 the title of Shanghai Creative Industrial Agglomeration Area in the first batch.see more in http://www.sheitc.gov.cn/

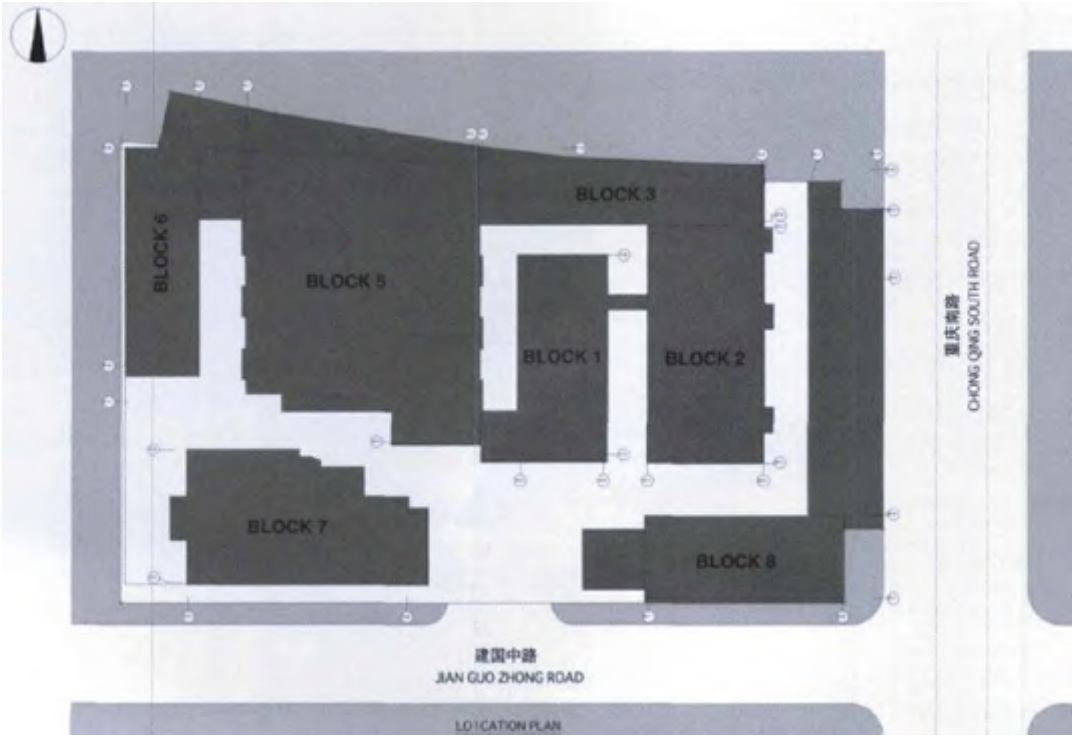

Figure 2-18 The layout of Bridge 8 Creative Industrial Agglomeration Area in Luwan District, Shanghai(Source: SEIICHI HIROKAWA, KENJi HANTANT, and HIDEKI AZUMA, "The Fashion Design Centre of No.8 Bridge in Shanghai," Time+ Architecture, 02 (2005), 107–111)

Figure 2-19 Bridge 8 is an office space renovated from Shanghai Automotive Brake Factory (Source: SEIICHI HIROKAWA, KENJi HANTANT and HIDEKI AZUMA, "The Fashion Design Centre of No.8 Bridge in Shanghai," Time+ Architecture, 02 (2005), 107–111.)

Figure 2-20 The exhibition space in Bridge 8 (Source: SEIICHI HIROKAWA, KENJi HANTANT, and HIDEKI AZUMA, "The Fashion Design Centre of No.8 Bridge in Shanghai," Time+ Architecture, 02 (2005), 107–111)

In addition to these projects with commercial purposes, from 2005, Shanghai consciously converted some original industrial land into public cultural use and introduced public functions such as culture, green space, etc. The idle 10th steel plant of shanghai steel company located in Huaihaixi Road is one example. Its outdoor ground and partial workshop space were transformed into a public art space - Shanghai Sculpture Space[15]. (Figure 2-21; Figure 2-22;Figure 2-23),

The NO.10 steel plant of Shanghai steel company was founded in 1956 and was the first steel company independently created in Shanghai. In 1989, after the transformation of enterprise, the factory was left unused and became a valuable large-scale industrial site in central city of Shanghai. With its high structure and wide space, it provided ideal space for development for Shanghai Sculpture Space which considered the large display as the core. Although the architecture and the historical value of the industrial building in NO.10 steel plant of Shanghai steel company did not reach the protection level, the architect made full use of its industry style, history, and the scale of the interior space to add new functions. The sense of continuity and rhythm formed by tall and continuous roof truss structure of the original building was preserved. After renovation, the sculpture center open to the public was established. At the same time, they also introduced all kinds of galleries, art institutions, office space, and matched recreational space such as cafes, bars, etc. to increase economic benefits[16].

[15] See more in http://www.sss570.com/

[16] Sheng Zhong, "Production, Creative Firms and Urban Space in Shanghai," *Culture Unbound: Journal of Current Cultural Research*, 4 (2011), 23–24 <doi:10.3384/cu.2000.1525.124169>.pp.23-24

Figure 2-21 Shanghai Sculpture Space (also named Red Town), which was once occupied by the state-owned NO.10 Steel Plant, was renovated as a flagship cultural project by the Shanghai government. After an architectural rehabilitation implemented under a public-private partnership arrangement in 2005, it became a sculpture park with bars, cafes and contemporary galleries. (Photo: by author)

Figure 2-22 Coffee bars in Shanghai Sculpture Space. (Photo: by author)

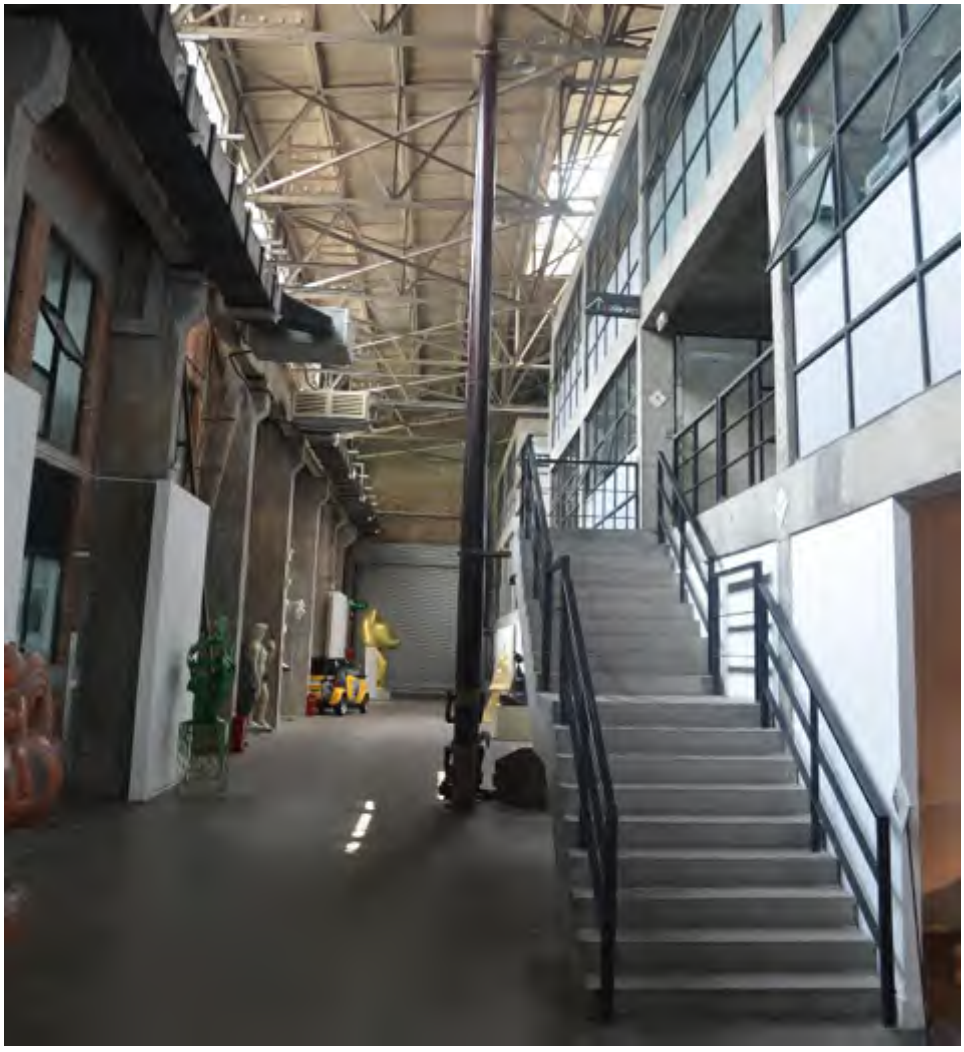

Figure 2-23 The interior exhibition and office space in Shanghai Sculpture Space. (Photo: by author)

In this period, transforming industrial heritage into creative industrial agglomeration area had gradually become the main method for the reuse of old factory buildings, warehouses, etc. On the one hand, the Shanghai government gradually realized industrial buildings with industrial history could be reused, at the same time their rich history and culture were worth digging seriously; On the other hand, for there was an impassable boundary between the industrial land and commercial land, and there were different rent standards under national land policy. Therefore, there were a lot of difficulties in the transformation process. Shanghai explored operation mechanism of government's guide, market's operation and intermediary services and creatively put forward the principle of "three unchanged", namely the housing property, building structure and land property does not change. Because housing property does not change, leasehold relationcan can ensure owner's profit. The unchanged building structure can protect the original industrial buildings; land property remains the same, which is a rigid index in China. However, in the development and utilization of old factory building, keeping these three rules is not easy. The creative industry makes these transitions possible.

As a *Creative Industrial Agglomeration Area*, the land usage belongs to industrial estate, the property right belongs to enterprise and the basic architectural form does not

change. Under these unchanged conditions, the investor and owner sign 2-20 years leasing agreement. The rent is negotiated by both parties. With this unique path of "three unchanged", Shanghai effectively resolved the restrictions between industrial land and commercial land and also solved the problem of industrial architecture protection capital. Taking Bridge 8 as an example, Life Style Centre Holdings Limited rent it for 20 years. They reformed the plant according to the special requirements of the creative industries and rent them out. The government won double benefits of tax and urban historic protection. As an investor, Life Style Centre Holdings Limited recovered the cost in 5 years and enjoyed profit for a period of 15 years[17]. The owner of factory earned the rent and the laid-off workers also had a stable income. This is the reason why Shanghai takes good care of creative industry. They made a lot of the abandoned industrial buildings and sites no longer become the burden in city development.

Moreover, "Three unchanged" brings out a lot of changes: the industrial structure has changed from the original processing and manufacturing to design service for production and consumption, such as advertisement, design, construction, art wares, fashion, software, TV broadcasting, arts and cultural relics trading industries; The employment structure has changed, from labor-intensive industrial workers to the artist and knowledge-intensive white-collar workers; the management mode has changed from factory management to management mode of dozens or even hundreds of companies; business form has changed from lathe, engine, production line to clean and quiet garden community with computer, exhibition hall, leisure square, coffee room, etc.; enterprise culture has changed from single standard of processing and standard production to multiculture with the burst of inspiration and creativity.[18]

2.1.3.4 More diverse reuse ways

Through transforming industrial heritage to *Creative Industrial Agglomeration Area*, the protection of Shanghai industrial heritage gradually formed a co-existing of government's leading and active participation by different parties. However, there also existed problem in the homogenized mode of operation at the same time. Many industrial buildings and site after renovation have the same function. In recent years, with diversity of investment subjects and policy adjustment, some industrial heritage are began to be transformed to the office, community service facilities, business, cultural leisure, hotel, exhibition and urban open space, etc. In the case of office Z58 (Figure 2-24) designed by Japanese architect Kengo Kuma, it was transformed from the former Shanghai Watch Tenth Factory. The architect completely demolished the first three rebar concrete trusses along the road and built the entrance hall. The rest of the original structures were completely hidden behind the new building. In some cases, facing of the current housing situation, a group of old factory buildings are transformed to low-rent housing, single apartment, etc. Some businessmen take advantage of low rent and flexible availability and transform them into economical hotel. These show the diverse reuse approaches promoted by the private capital strength, indicating the

[17] GUAN Juan, "The Operation Mechanism Development of Urban Regeneration in Shanghai Downtown" (Tongji university, 2008), p. 106.
[18] *Ibid*.p.106

different understandings with the orthodox protection and reuse concepts of industrial heritage.

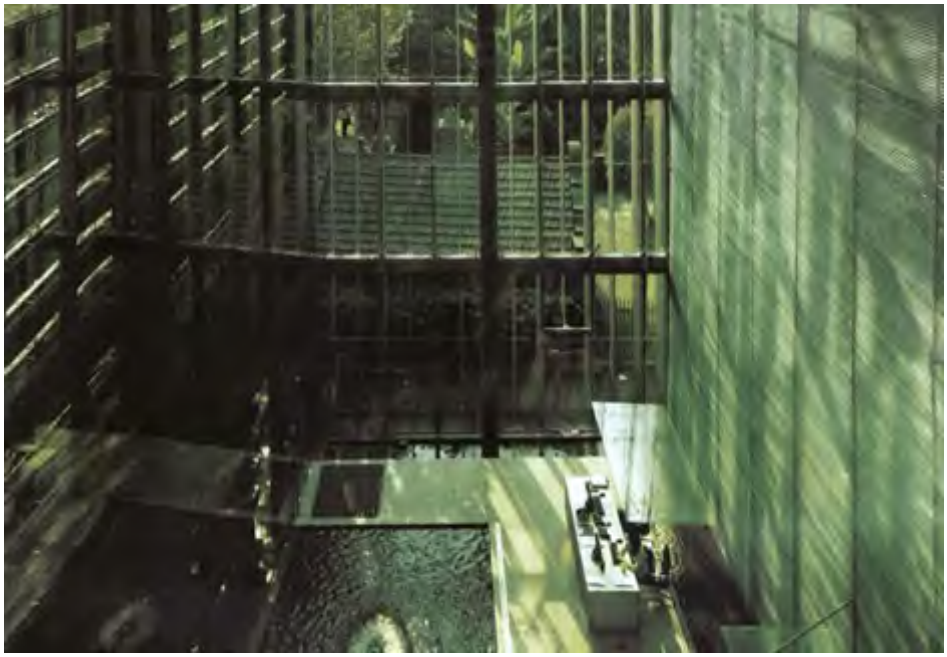

Figure 2-24 the office Z58 designed by Japanese architect Kengo Kuma was transformed from the former Shanghai Watch Tenth Factory. (Source: HASHIMOTO, Jun, LU Yuxing, and LI Bin, "Meaning of Skin Z58 Shanghai by Kengo Kuma," TIME+ARCHITECTURE, 01 (2007), 74–83)

Figure 2-25 In the Shanghai Xujiahui public green space, part of the original China Rubber Plant was preserved as elements in urban green space landscape (Source: CHEN Peng, and HU Lili, "The Conservation and Reuse Strategies for the Industry Heritages in Shanghai," Shanghai Urban Planning, 01 (2013), 16–22)

The combination of industrial heritage and urban public green space was another new way for protection and utilization. In the construction of Xujiahui public green space(Figure 2-25), part of the original China Rubber Plant was preserved as a part of urban green space landscape. At the same time, the utilization of industrial heritage also promoted the development of Shanghai tourism. In 2004, the Shanghai municipal government investigate Suzhou Creek coasts, the first industrial heritage tourism planning. In 2005, they schemed the first special plan *Shanghai Industrial Heritage Tourism Development Plan 2010*[19]. In 2006, the first industrial heritage tourism local standards *Requirements for the Shanghai Industrial Heritage Tourism Service Quality* was formulated[20].

In addition to the use of single building, Shanghai also seized the opportunity of World Expo and gradually began to reuse industrial zone. In the overall planning of Shanghai, both shores of Huangpu River were identified as public open space. Along the river stretching 20 km, a large number of factory buildings and industrial structures were located there, which witnessed 150-year development course of China's modern industry. With the purpose of "accelerating the reform of the old city area"[21], Shanghai Expo chose the old industrial area along the Huangpu River as the object. According to the overall planning of the Expo park, in this 5.28 km^2 area, 380,000 m^2 buildings of industrial buildings and homes were put into the scope of protection, of which 250000 m^2 existing industrial buildings were preserved and converted into the exhibition hall, leisure square, etc[22]. (Figure 2-26;Figure 2-27)There are a total of more than 20 industrial buildings in the park, according to their historical value, aesthetic value and use value, they were divided into three categories: protection buildings, retention buildings and transformation buildings. Regarding the protection buildings, such as the Navy Headquarters and office building of Shanghai Jiangnan Shipyard (Figure 2-28), they adopted structure reinforcement, facade renovation and partial recovery form the reuse. Meanwhile, a large number of retention and transformation buildings were transformed into expo pavilions and other facilities.

[19] See more in http://www.itripsh.gov.cn/
[20] *Ibid*
[21] See more in www.expo2010.cn/
[22] ZUO Yan, "Opportunities and Challenge on Reuse of Industrial Heritage Rethinking on Transformation of Waterfront Industrial Buildings of Expo 2010 Shanghai," *TIME + ARCHITECTURE*, 03 (2010), 20–25.

Figure 2-26 The industrial area along the HuangPu river in Shanghai (Source: CHEN Peng, and HU Lili, "The Conservation and Reuse Strategies for the Industry Heritages in Shanghai," Shanghai Urban Planning, 01 (2013), 16–22)

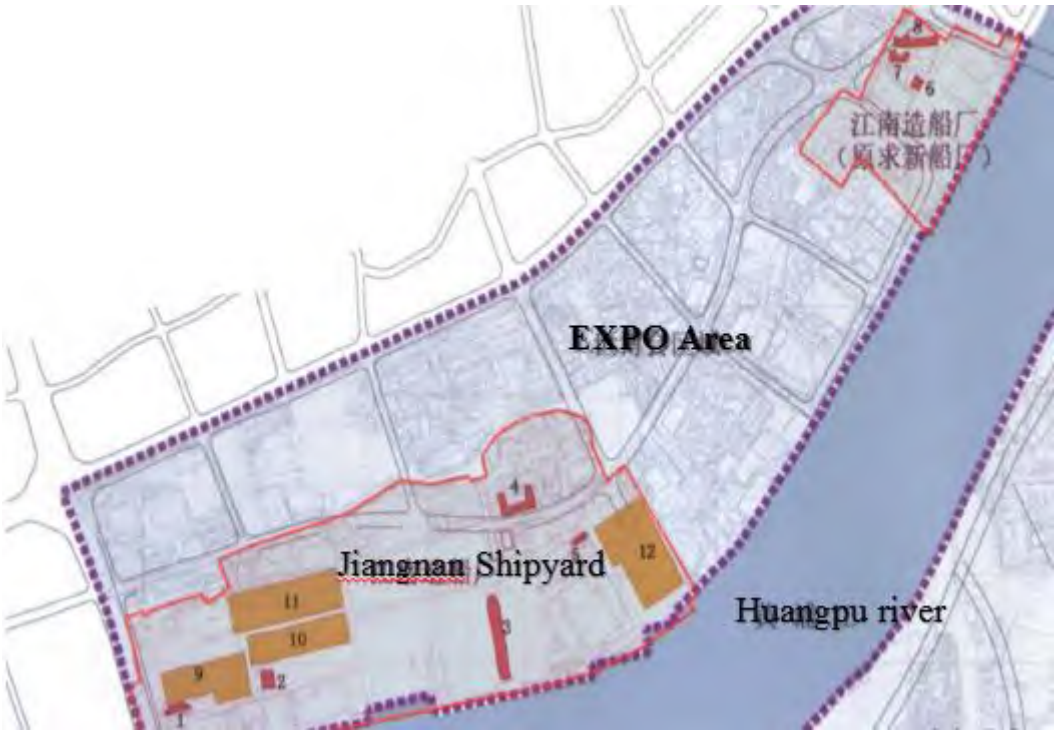

Figure 2-27 Shanghai Jiangnan Shipyard in the old industrial area along the Huangpu River; This area was chosen for the Shanghai Expoin 2010 (Source:CHEN Yun-qi, YIN Jian-ping and LIU He, "Let the 'Jiangnan Culture' Stay beside the Huangpu River:Preliminary Study of the Conservation and Rehabilitation of Jiangnan Shipyard," TIME ARCHITECTURE, 02 (2006), 67–71.)

Figure 2-28 The protected office building in Jiangnan Shipyard (Source: Yun-qi, CHEN, YIN Jian-ping, and LIU He, "Let the 'Jiangnan Culture' Stay beside the Huangpu River:Preliminary Study of the Conservation and Rehabilitation of Jiangnan Shipyard," TIME ARCHITECTURE, 02 (2006), 67–71)

In the aim of reservation of architectural style and decreasing of rebuilding cost, in the former reuse of the industrial building, it usually conducted whole reinforcement and adaptability improvment for the original structure and tended to reuse recycling materials such as old brick, wood, etc. with a sense of history. In the reuse practice of World Expo, the designer's energy-saving consciousness was enhanced distinctly and the use of energy-saving technology was more mature. Shanghai Nanshi power plant(Figure 2-29;Figure 2-30) is an example. It is one of the earliest city power plants in our country and transformed into Pavilion of Future. In transformation, energy-saving technologies were employed, for example, solar photovoltaic power generation, wind power, river water source heat pump, active artificial light, water recycling technology, semiconductor lighting technology, etc. which makes it be the first three-star green building renovated from industrial heritage.

From the cases above, it can be seen that Shanghai's reuse of industrial heritage is a process of constant evolution. In the early 1990s, because the related protection policies had not been issued, a large number of industrial heritage have not been included in the scope of protection. Most reuses were out of economic purposes. Some reuse destroyed the original architectural style and structural system. With the intervention of artists, the reuse methodology became more rational. They let the dilapidated factory buildings and warehouse back to their original appearances. Their successful practices made industrial heritage reuse become popular. Then, the mode of *Creative Industrial Agglomeration Area* plays a positive role in the protection and reuse. Then, the reuse ways become diversified and the reuse began to shift from single building to industrial area's overall landscape.

Figure 2-29 Shanghai Nanshi power plant was transformed into Pavilion of Future in Expo 2010(Photo: by author)

Figure 2-30 the exhibition space in the renovated Shanghai Nanshi power plant (Photo: by author)

2.2 Beijing: Reuse for Growing Cultural Activities

2.2.1 Background

In view of the historical stage, the early modern industrial development in Beijing has weak industrial base and few industrial remains. Modern industry develops rapidly and has rich industrial remains. In Ming and Qing dynasties (1368-1911) as the imperial city, Beijing was not an industrial city for a long time determined by the special position. In the late Qing dynasty modern industry began to bud and had certain development. Until the Republican period (1911-1949), the culture and tertiary industry were relatively developed, while the industry was relatively backward. In 1950s, Beijing shifted to a production city. There appeared industrial boom. A lot of heavy industrial projects were built. After 1980, the municipal government has carried on the adjustment of industrial structure vigorously. Especially a batch of enterprises with large, severe pollution and serious resource consumption had been moved out of the center city and there were a large number of idle factories. Most plants with large size, solid structure, wide space, become one focus of industrial heritage resources in Beijing.

In view of geographic distribution, the distributions of industrial heritage are concentrated in suburbs. During the 1890-1949, several large industrial enterprises in Beijing, such as Shijingshan Steel Plant, Shijingshan Power Plant, Qinghe Woolen Cloth Factory, etc. mainly concentrated in the western and northern suburb. At the beginning of the 1950s, Beijing gradually formed major industrial zones, including (1) cotton spinning industrial zone, coking industrial zone in east suburb; (2) chemical industrial zone in southeastern suburb; (3) coking plant zone in southeastern suburb; (4) electronic industrial zone in northeaster suburb; (5) wool spinning industrial zone, building materials industrial zone in northern suburb; (6) iron and steel, electric power industrial zone in western suburb; (7) locomotive manufacturing industrial zone in southwestern suburb; (8) railway in southwestern suburb; (9) chemical industrial zone in southern suburban.(Figure 2-31) With the development of city development, the old industrial zones above located in suburbs gradually become the margin of urban area of Beijing. Currently, they are also the most concentrated distribution areas of the Beijing industrial heritage.

Figure 2-31 Geographic distribution of industrial zone in Beijing (Source: Liu Boying and Li Kuang, "Study on the System of Beijing Industrial Heritage Conservation and Reuse," Architectural Journal, 2 (2010), 1–6.)

Since 1991, the rapid transformation of Beijing started, when the city launched the "Old and Dilapidated (or Hazardous) Housing Renewal" program.[23] This massive restructuring of the manufacturing sector in Beijing is also a demolition process of industrial buildings and sites. there were almost 400 industry enterprise relocated, 20,000,000 ㎡ area of industrial buildings dismantled, and more than 20 km^2 of industrial land disappeared. Now, the 27,000,000 ㎡ area of industrial buildings left in Beijing will be a resource for the urban development.[24]

From the development process of Beijing's modern industry, we can see that most of the industrial heritage in Beijing is originated from the period after 1949, but their historical value is not so extraordinary compared to the industrial heritage before 1949. For these rare industrial buildings before 1949, they did not get enough attention to be preserved, and most of them were destroyed or demolished. By comparison, the majority of those industrial heritage after 1949 are preserved until today and became

[23] The renewal program had a major impact on the old city areas of Beijing like the demolition of obstacle buildings and the old City Wall. Daniel Benjamin Abramson, "The Aesthetics of City-Scale Preservation Policy in Beijing.," *Planning perspectives : PP*, 22 (2007), 129–66 <doi:10.1080/02665430701213531>.
[24] Liu Boying and Li Kuang, "Study on the System of Beijing Industrial Heritage Conservation and Reuse."

the testimony for the industrialization of Beijing. Based on this particular situation, Beijing not only emphasizes the conservation, but also pay more attention to encourages the reuse.

2.2.2 Protection System for Industrial Heritage

In Beijing, industrial heritage protection is also incorporated into Chinese cultural heritage protection system. At the local level, from 2006, Beijing Municipal Planning Commission presided over the present status investigation and analysis of industrial heritage carried on the overall plan of Beijing industrial land use, exploring methods and implementation strategies of industrial heritage protection. Meanwhile, Beijing Municipal Planning Commission investigated Beijing key industrial enterprises and compiled a list of Beijing key industrial enterprises and industrial construction resources, releasing *Guiding Opinions on Beijing's Development of Cultural Creative Industry Using Industrial Resources* and *Guiding Rule on Protection and Reusing of Beijing Industrial Heritage Resources*, which are the programmatic document and finally formed evaluation methodology and criterion of industrial architecture heritage[25].

On the basis of Guiding Rule on Protection and Reusing of Beijing Industrial Heritage Resources, the basic concept of Beijing industrial heritage is as follows: Industrial remains closely related to industry development since the late 1870s in Beijing city, with historical values, social and cultural values, aesthetic values, science values and economic reusing values, as well as transit facilities serving for industry, social activities place which are related to public facilities and commercial run.

According to the value of industrial heritage, the industrial heritage protections have been divided into 4 levels.

(1) Protecting as cultural relics protection unit at different levels. Industrial heritage resources which are in accord with accreditation standard of cultural relics protection unit can declare at different levels. The management is implemented with references to *Law of the People's Republic of China on Protection of Cultural Relics (2002)* and *Urban and Rural Planning Act*. Currently, three sites have been listed into Beijing cultural relics protection unit at city level for preservation: Beijing Banknote Printing Plant, Xizhimen railway station and Zhengyang Gate railway station.

(2) Protecting as *Beijing Excellent Modern Buildings*. The Industrial heritage resources which meet the evaluation criteria can be applied for the inclusion of excellent modern buildings list. The detailed management should be carried out according to *implementation of excellent modern buildings management*. Recently an increasing attention has been paid to the industrial architecture heritage. In December 2007, six industrial architecture heritages were included in *The Protection List of Beijing Excellent Modern Buildings* (First batch), jointly announced by the Beijing Municipal Planning Commission and the Beijing Municipal Administration of Cultural Heritage. They are Beijing Waterworks Modern buildings (formerly Capital Waterworks Co.,

[25] Liu Boying, and Li Kuang, "Study on the System of Beijing Industrial Heritage Conservation and Reuse," Architectural Journal, 2 (2010), 1–6

Ltd.), Beijing Railway Bureau staff houses of the infrastructure engineering team (formerly Tsinghua station of Pingsui railway), equipment tower of Shuanghesheng Five Star beer joint company, exhibition hall and bunker of Capital steel factory, 798 modern buildings (former 798 factory), Beijing coking factory (1 # 2 # coke and 1 # coal tower), accounting 8.45% for all 71 modern architectures. Protection is the main way for the entire industrial architecture heritage.

(3) Protecting as industrial architecture heritage. For industrial architecture heritage which has outstanding heritage value but has not been included in the list of cultural relics protection units at all levels and list of *Excellent Modern Buildings*, the lists of industrial architecture heritage are made to be one of the control elements for the urban planning to control the future construction. Removal of these buildings is forbidden and the main part should be remained including the original structure and architecture style; and displacement is also not allowed for immovable buildings, sites, facilities and equipment with special significance. Reparation and replacement of architectural usage are allowed under reasonable protection. Meanwhile, the new usage should respect the important building structure and should as far as possible be in harmony with the original function. Currently the protection lists for the industrial architecture in the Capital steel factory, Beijing Coking Factory, 798 industrial area and Ertong zone of Capital steel factory have all been made.

(4) Reusing as industrial architecture resources. Those large quantity industrial architecture resources which have less heritage values but higher reusing values could be conducted reforming and reusing. The structures could be added new floors and conducted fa çade retrofit as well as replaced appropriate functions. The using pattern is relatively flexible.

Figure 2-32 The location of typical cases of industrial heritage protection and reuse in Beijing(Source: by author)

2.2.3 Evolvement of Reuse Ways

The reuse of industrial heritage in Beijing started at the beginning of 1990s. In this period, there are not so much cases compared to the 2000s. As early as 1992, the Shuang'an Department Store (Figure 2-33) in Beijing is a reuse project that reconstructed a watch plant as a shopping market. In the aim to save the state-owned

assets, the reuse emphasized the transformation of the original function to be office and market residence, but ignored to preserve the main characters of industrial buildings in its transformation process. Ocean Art Center (Figure 2-34), which was a textile factory building planned for demolishing, was renovated to an art center by architect Yung Ho Chang in 2001. Although it was destroyed in 2004, this project is the pioneer in the reuse of industrial building in Beijing.

Figure 2-33 Shuang'an Department Store reconstructed from a watch plant (Photo: by author)

Figure 2-34 Ocean Art Center, renovation by architect Yung Ho Chang, Beijing (Source: http://www.oceansky.net.cn/Article_end.asp?10200.shtml)

Similar with the situation in Shanghai, the artists began the reuse of industrial heritage with a spontaneous process in 1990s. A well-known case is 798. The abandoned workshop in Factory No. 798(Figure 2-35;Figure 2-36) began to be used by some artist, starting its transformation from industrial complex to the famous art area. 798 art zone, located at northeastern Beijing, was the old industrial area of state-owned 798 electronic industry. It was key industrial project built in the early 1950 s by the Soviet

Union and designed by East Germany. The Bauhaus style of architecture is succinct, guileless and pragmatic. With the change of times, influenced by China's industrial structure adjustment, large workshops became empty gradually. Since 1995, a group of artists and cultural institutions entered here. They rent and transform vacant plant as a venue for the artistic creation. 798 Factory developed as cluster area of art center, galleries, artist studios, design companies, food and beverage bar, etc. to form Soho type art groups with international Loft way of life.

Figure 2-35 798 Art Zone in Beijing (Photo: by author)

Figure 2-36 798 Art Zone in Beijing (Photo: by author)

Figure 2-37 the interior of the industrial building in 798 Art Zone in Beijing (Photo: by author)

The success of 798 promotes the vigorous development of cultural creative industry in Beijing. There are more and more accumulation areas of cultural creative industry through utilization and reform of the industrial buildings. They mainly focus on art, design, media and high-tech industries. In 2006, the Beijing municipal government issued instructions about *Utilizing Industrial Resources to Develop Cultural Creative Industry*. The list of *Creative Industrial Agglomeration Area* was published, including Design-Park751, Laijin Cultural *Creative Industrial Agglomeration Area*, etc.

751 industrial complex was once one of the three largest gas plants in Beijing and founded in the early 1970s. Through two expansions in the 1980s and 1990s, it covered an area of 220,000 square meters (Figure 2-38). According to the requirements of the Beijing industrial structure adjustment, the gas production was out of operation in 2003. The old factory put out the fire burning for more than 30 years. At the beginning of 2007, Beijing municipal government decided to reconstructed 751 industrial complex into fashion design park, officially named as the "Design-Park". On the basis of the original building, 100 new fashion designers' studios were built. It forms a Creative Industrial Agglomeration Area featured as clothing design. Unlike 798 art zone, 751 is an art agglomeration area together created by the Beijing municipal government, Beijing Industrial Promotion Bureau and China Fashion Association and eventually become a gathering place of hotel, bar, book club, public plaza, catering, galleries and artist studios.

Figure 2-38 the location of 751 and 798 industrial complex in Beijing (Photo: by author)

Figure 2-39 the industrial remians in Design-Park 751 in Beijing. The former gas plants was assessed as a Creative Industrial Agglomeration Area. (Photo: by author)

Figure 2-40 the playground in Design-Park 751 in Beijing. The former gas plants was assessed as a Creative Industrial Agglomeration Area. (Photo: by author)

Laijin Cultural Creative Industrial Agglomeration Area is transformed by a textile plant. Beijing No. 2 Textile Factory was founded in the early 1950s. It is China's largest cotton textile factory first to adopt domestic equipment. After the 1980s, like other textile mills, because of low production efficiency, it cannot meet the requirement of industrial structure adjustment and began to move out and left vacant plants. In 2008, Beijing Guomian Cultural and Creative development Co., Ltd. Started the overall transformation of the plant. After more than one-year transformation, Laijin Cultural Creative Industrial Agglomeration Area was completed in 2011. On the premise of fully retaining the original architectural features, the Japanese architect Kengo Kuma transformed the old factory into courtyard office park by structural segmentation, natural lighting and three-dimensional afforesting, etc. Textile factory's special saw tooth roof was retained and saw tooth space also was used in every corner of the park. More than 100 creative enterprises, such as new media, advertising, animation, etc. entered the park. Compared with spontaneously formed 798 art zone, Laijin Park is real estate development project with overall planning. The public facilities of 798 art area, such as toilet, parking space was not good planned. As a new generation of Creative Industrial Agglomeration Area, Laijin Park has bank, parking lot, catering facilities, etc. in proportion with the park's surrounding and internal part. It has the characteristics of overall design and complete system.

Figure 2-41 Laijin Cultural Creative Industrial Agglomeration Area transformed from Beijing No. 2 Textile Factory (Photo: by author)

Figure 2-42 The garden in Laijin Cultural Creative Industrial Agglomeration Area transformed from Beijing No. 2 Textile Factory (Photo: by author)

Apart from the individual industrial heritage, at present, the industrial heritage preservation area, such as Capital Steel industrial heritage preservation area and Beijing Coke-oven Plant industrial heritage preservation area, lays emphasis mainly on protect constitutive property and integrity, ensuring comparatively reflecting integral connotation of the industrial heritage.

Beijing Coking Plant, located in the eastern suburb of Beijing, was built in 1959. It was one of the largest coal chemical enterprises in our country and also one of the country's largest commodity coke plants and the main base of gas supply in Beijing. As a typical representative of coal chemical industry, with its complete pattern and distinct characteristic, after transformation it become the heritage park open to the public.

According to the principle of overall protection, the modification was conducted with the original four production lines as the theme. Meanwhile, for the single buildings, the majority was preserved to represent production system.

Figure 2-43 Beijing Coking Plant located in the eastern suburb of Beijing（Source：MEN Yu, "The Conflict between Preservation and Revitalization of Beijing Coking Plant", 2008, 2664–2676.）

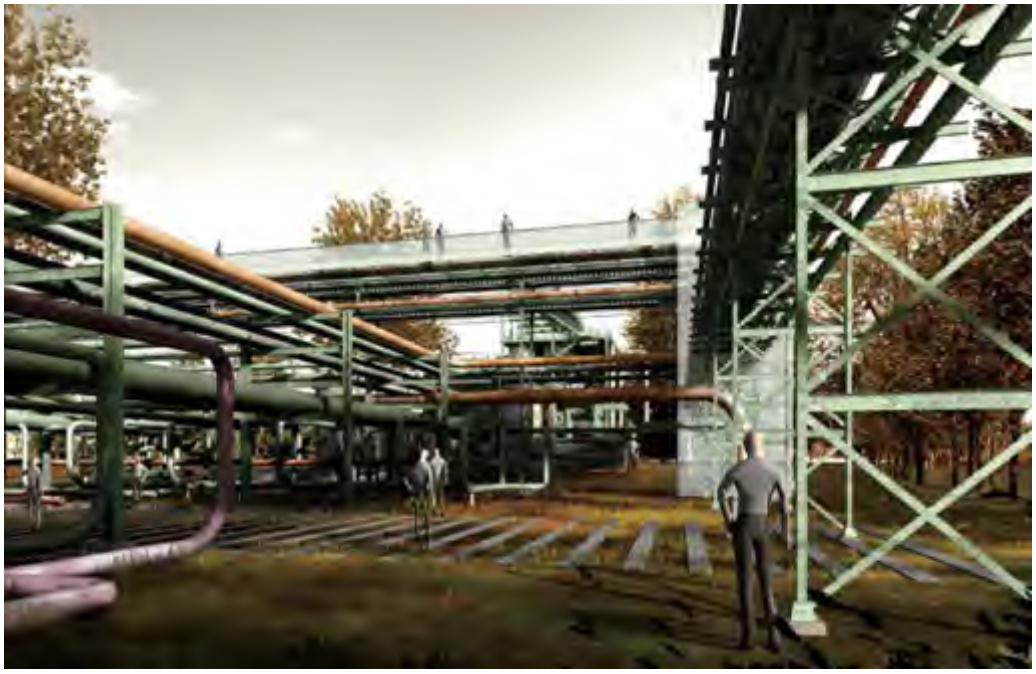

Figure 2-44 Rendering of the reuse project for Beijing Coking Plant（Source：MEN Yu, "The Conflict between Preservation and Revitalization of Beijing Coking Plant," in 2009 urban planning conference, 2008, pp. 2664–2676）

Capital Steel Group was founded in 1919, covering an area of about 1 square kilometer. It is one of the earliest modern iron and steel enterprises in China. After 90-year development, the factory area is 7 square kilometers focusing on iron and steel production. After 2000, Capital Steel Group was out of production. A lot of buildings, structures and various facilities in the main industrial area were left, with a total construction area of 2 million square meters. According to the *Beijing Comprehensive Plan* (2004-2020) and *Capital Steel Industrial Park Reform Planning* issued in 2007, Capital Steel industrial area will be transformed into comprehensive service center in the west of Beijing focusing on six big industries, namely, industrial research and development, productive services, urban services, cultural media, industrial education training, industrial expo tourism. The whole area is divided into administrative center, northern cultural creative industry area, central urban public service area, economic zone, eastern headquarter economic zone. The specific protection and renovation plan is still in discussion.

Figure 2-45 Satellite image of the capital steel industrial district （Source：Liu Boying and Li Kuang, "Study on Preservation and Re-Usage of Industrial Heritage Resource in Capital Steel Industrial District," Architectural Creation, 9 (2006), 36–51.）

Figure 2-46 Historical picture of capital steel industrial district in 1950s（Source：Liu Boying, and Li Kuang, “Study on Preservation and Re-Usage of Industrial Heritage Resource in Capital Steel Industrial District,” Architectural Creation, 9 (2006), 36–51）

Figure 2-47 bird's-eye view on the capital steel industrial district（Source：Liu Boying, and Li Kuang, “Study on Preservation and Re-Usage of Industrial Heritage Resource in Capital Steel Industrial District,” Architectural Creation, 9 (2006), 36–51）

2.3 Imitation and Disparity: Reuse of Industrial Heritage in other Chinese Cities

When the artists and creative industry played an important role in initiating the reuse of industrial building in Shanghai and Beijing, the discussion on reuse, such as the adaptive-reuse of waterfront, industrial quarters and lands for warehousing and storage, were emerging in many other cities in China.[26] The successful cases in Shanghai and Beijing, were soon imitated in other cities[27].

2.3.1 Nanjing: Developing the Creative Industry Parks

Nanjing is located on the bank of Yangtze River, and an essential industrial city in the south of China. Jinling Arsenal (Figure2-50), built in1865 in Qing dynasty, was the first factory with machine production, starting the era of modern industry in Nanjing.[28] From then on, linked to the water transport, there were many industrial buildings belonging to the modern military industry and civil industry located in Nanjing. The distribution and layout of the industry in contemporary Nanjing city were founded later, in the period of the Republic of China (1911-1949). Two Industrial Zones were planned on the two sides of the Yangtze River in the capital plan, whereas the north zone for industry with pollution and the south zone for small-scale industry without pollution. After 1949, with the proper redistribution of industry, the factories with more than 1000 workers cannot be built in the city any more. Nowadays, Nanjing has developed into a multiple-producing industrial base, an important hub of transportation and communication center in the Yangtze Delta region.

Due to its history as a semi-colony city and the capital in Republic of China, the layout of industrial heritage in Nanjing represent some particular characters. The layout is cluttered as a result of the uneven development of industry. Compared to the militia industry with large scale and complete production equipment, the civil industry in Nanjing is in small scale and lower technology and production. However, both of these two types are not preserved intact and in poor condition. Meanwhile, it have an extensive distribution of industrial heritage, which is similar to the situation in other earliest industrial cities like Beijing, Shanghai, Tianjin, and Wuhan.

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[26] Jianguo Wang and Jiang Nan, "Conservation and Adaptive-reuse of Historical Industrial Building in China in the Post-industrial Era," *Frontiers of Architecture and Civil Engineering in China*, 1 (2007), pp.474–480 <doi:10.1007/s11709-007-0064-5>.

[27] Another fact need to be noted is the disparity between the eastern coastal region, the central and western interior region and the Northeast region in China. Shanghai, Beijing, Tianjin and Nanjing are in China's prosperous east, while Harbin is in the far northern territory. Because of this relatively intractable problem of uneven regional development, the attitudes for the reuse of industrial heritage are different in these cities.

[28] 1865, Li Hongzhang moved into Nanjing, and built a factory, planning for the Jinling Arsenal, also called the Jinling Arms Bureau. The site included a machine factory, a molding factory and an iron-smelting studio to manufacture bullets, weapons and helmets. When it was putted into production, there were about 400 workers. Soon after the official opening of the Jinling Arsenal, it became one of the four biggest munitions factories in China. See more in http://www.myq.com.cn/article/view/45

Figure 2-48 Zoning of Nanjing as proposed in the Capital Plan (Source: Carmen Tsui, "State Capacity in City Planning: The Reconstruction of Nanjing, 1927-1937," Cross-Currents: East Asian History and Culture Review, 1 (2012), 12–46 <doi:10.1353/ach.2012.0005>.)

The transformation of the old industrial bases in Nanjing began from the 1990s, when the foreign capital became an important part of urban industrial development with China's marketisation reform[29]. Until 2006, encouraged by Nanjing's Government, large amounts of industrial enterprises moved to the development zones or industrial park in the suburbs. The old industrial bases in the city underwent the regeneration. At the same time, 10 large state-owned enterprises, which covered an area more than 5% of the total area of original Nanjing city, began to transform since 2006. Among them, some industrial heritage are reused as industrial ruins park, such as the Treasure Ship Yard Relics Park; some industrial building was reused as exhibition space, such as the Nanjing single art center.

[29] Since 1990s，with the paid use of land and the continuously higher demand on the enhancement of environment in the main city zone, Nanjing city proposed to "increase no more land generally for industrial use in the main city; the retained industries mainly centre on intension development; the adjustment to industrial land mainly centers on migration, conversion and transformation." See more in Shi Nan and others, *UK China Sustainable Development Dialogue Urban Theme : Urban Regeneration of Industrial Areas Affordable Housing for Low Income Populations in Cities*, 2010, pp. 1–60.

Figure 2-49 Industrial land and Creative Industry in Nanjing (Source: Jiang Nan, "Developing Creative Industry by Adaptive Reuse of Industrial Heritage : Take Nanjing for Example," in The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress, 2012, pp. 1–11.)

With the promotion by government, clusters of creative industry based on the resue of old factory areas also have been emerging in Nanjing,[30]such as the Chenguang 1865 Creative Industry Park(Figure 2-51), World Creative Industry Park and Nanjing Creative Center Park of Technology and Culture. By 2009, the number of various creative industry parks, having been completed and being built in Nanjing, had reached nearly 50, involving a total floor area of nearly 8 million square meters.[31] In terms of its spatial layout, a belt of creative industry was formed in southern and northern Nanjing respectively (Figure 2-49).

[30] The Municipal Government of Nanjing has promulgated a series of incentive policies for the combination of creative industry and industrial heritage: industrial parks and buildings completed after replacement of old factory buildings enjoy the same preferential policies as suburban parks. After the adaption of old factory buildings, the nature of land and factory buildings remains unchanged. See more in Nan, Jiang, "Developing Creative Industry by Adaptive Reuse of Industrial Heritage : Take Nanjing for Example," in The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress, 2012, pp.5

[31] *Ibid*.pp.01-11.

In this regeneration of old industrial buildings and complex in Nanjing, the strategies adopted in the reuse can be concluded into three types. The first one is the integrated use of land for creative industry and old industry. Some former industrial buildings were transformed into commercial or official buildings with a low renting. This strategy is popular and can be found in most of the reuse projects in other cities. The second is the adaptive reuse, with the former industrial use transformed in to new use. For example, the former factory house of the Weifen Motor Plant was transformed into a restaurant. Plant 7316, located outside of Yifeng Gate, was combined with the scenic spot of Shizi Mountain Xiuqiu Park and scenic belt of the city wall of the Ming Dynasty.[32] The third one is preservation of important industrial heritage, which witness the evolution of industry development in Nanjing. Chenguang Machinery Plant and Xiaguan Power Plant are such cases. When the creative industry park was built in the old factory area, former old factory houses and important industrial equipment, related to the historic sites, were preserved. In the reconstruction of the Xiaguan Power Plant, former production lines, chimneys and other symbols were preserved and utilized.

Figure2-50 Nanjing Jinling Arsenal, 1865 (Source: GONG Kai and HUANG Lingling, "Study on the Status Quo and Reuse of Industrial Heritage in Nanjing," BEIJING PLANNING REVIEW, 2011.)

[32] Nan, Jiang, "Developing Creative Industry by Adaptive Reuse of Industrial Heritage : Take Nanjing for Example," in The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress, 2012, pp. 1–11

Figure 2-51 Chenguang 1865 Sci-tech Creative Industrial park. The predecessor of this park is the Jinling Machinery Manufacture Bureau, which was established in 1865 during the Westernization Movement period. Located in the central area of its predecessor's site, the Park is named therefore. With five functional areas respectively involving fashionable life relaxation, hi-tech creative R&D, arts & crafts creation, hotel & commerce and hi-tech creation exhibition. (Source; http://en.investnanjing.gov.cn/index.php/Carrier/view/id/122)

2.3.2 Harbin: Transforming the Large Industrial Base

The Northeast region is China's traditional industrial base, with the major industrial projects in the iron and steel, energy, heavy machinery, vehicle and airplane manufacturing and so on. Major cities include Harbin, Shenyang, Dalian, Changchun and Anshan, all with several million inhabitants. So it is necessary to read Harbin in the whole context of the Northeast region, because they share the same characters in the development of industry.

As one of the earliest regions to industrialize in China, the beginning of a modern national industry in Northeast China can be traced back to the colonial history of Russia and Japanese imperialism. [33] After the founding of the People's Republic of China (1949), Northeast China continued to be a major industrial base of the country. Owing to the very abundant natural resources, unique development history, Northeast China was built to be the first industrialized region in the 1950s– 1960s, with the result that it won its historic position as the largest industrial base of China at that time.[34] However,

[33] Fan Xiao-jun and Xu Honggang, "Selective Interpretation of Chinese Industrial Heritage — Case Study of Shenyang Tiexi District," in *The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress*, 2012, p. 12.
[34] Pingyu Zhang, "Revitalizing Old Industrial Base of Northeast China: Process, Policy and Challenge," *Chinese Geographical Science*, 18 (2008), pp.109–118

from 1980 to 2004, due to the lack of upgrading technology and adjusting the structure, the percentages of industrial production began to decrease. Things turned to be more serious in mid-1990s, then the government had initialized the Revitalize the Northeast campaign to counter this problem. [35]

Based on this history and nowadays situation, the reuse of industrial heritage in Harbin and other cities in northeast region means the rehabilitation of these large scale old industrial bases. Tiexi district of Shenyang is such a typical case. Tiexi is called "Eastern Ruhr" with nearly one hundred year industrial history and abundant industrial remains, carrying much industrial history and reflect the historical process and cultural change of this old industrial base.[36] As a heavy industrial base, these districts are also regarded as bad environmental and poor living condition region because of industrial pollution for almost a half century. How to transform them from industrial production into commercial and residential use is still uncertain. How to set the protection planning area of industrial heritage and establish a regional cooperation mechanism need to be further studied.

Another problem is how to deal with its distinctive colonial imprint of industrial heritage. This colonial history is accompanied with the development of industry in the northeast region, which is always ignored emotionally and deliberately in the industrial heritage reuse. Due to the denial attitude of industrial culture, there is a common phenomenon in the industrial heritage reuse that dark and shameful parts are removed or ignored and only left a version fit for the contemporary needs.

Except for the industrial heritage in the old industrial base, the railway industrial heritage is another important topic these years, because modern industry of Harbin started with the construction of the railway. Harbin was founded in Russia in 1898 with the coming of the trains-Manchurian Railway, today known as the Chinese Eastern Railway. [37] The technology, equipment and concepts brought in by the Russian nationals, established the fundamental features and industry types of modern architecture in Harbin. Now how to deal with these special industrial heritage have given rise to a lot of discussion.

[35] *Ibid*, pp.109-118.
[36] Xiao-jun, Fan, and Xu Honggang, "Selective Interpretation of Chinese Industrial Heritage — Case Study of Shenyang Tiexi District," in The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress, 2012, p. 12
[37] http://en.wikipedia.org/wiki/Harbin

Figure 2-52 View of Locomotive garage of Chinese Eastern Railway in Hengdaohezi .The locomotive garage was built in 1903 and disused in 1990, has a crescent-shaped arrangement with red brick and iron tile. There were 15 parking spaces and a rotary table (already dismantled) in front of the door. (Photo: provided by Marco Trisciuoglio)

2.3.3 Tianjin: Reuse with Waterfront Regeneration

Tianjin[38], due to its location on the Grand Canal and between ocean and land transportation, developed into a key industrial city in north China. The modern industry development in Tianjin is dynamic. Since the end of 19th century, Tianjin not only became a treaty port, but also a gate through which to enter Beijing from the ocean. Its economic boomed in the early decades of the 20th century, and a large quantities of large-scale factories were opened. Until 1949, Tianjin was not simply the economic center in north China, but also China's leading trade and financial center after Shanghai.

After China's reform in 1992, the development of industry was slow down. The challenge for Tianjin was to reform the state-owned industrial enterprises. In this process of reform, numerous of industrial heritage in Tianjin were disappeared. With the background of the reform for the state-owned large and medium-sized enterprises, large qualities of industries in Tianjin closed down or moved out. After this, the second time of disappearance of industrial heritage was happened agian in the first decade of 21th century, when the real estate industry was listed as main support for economy. Then the urban land replacement had become a more important issue in development of Tianjin.

[38] Tianjin has a total size of 11,920 square kilometers, smaller than Beijing but bigger than Shanghai. The urban districts claimed a population of 5.9 million. The foundation for Tianjin's development started about one thousand years ago, in the Jin and Yuan dynasties, when Beijing was chosen to be the capital city for strategic reasons. See more in: Chung, Jae Ho, Cities in Post-Mao China: Recipes for Economic Development in the Reform Era, Recherche, ed. by Jae Ho Chung (Routledge, 2005), p. 320

As one of the pioneers of the China's modern industry, its important modern industries are mainly distributed in the Tanggu area, which located in the waterfronts Binhai new area. It witnessed nearly 100 year history of the industrial development in Tianjin, and became a miniature of China's industrial development process[39]. Since 2000, Tianjin Municipal Government decided to move the downtown enterprises eastward to the Binhai New Area of Tianjin. Now over 10 years of this strategic movement of downtown industry and industries structure reform, the industrial land was gradually transformed into residential and commercial use.

Figure 2-53 The growth process of industrial heritages in Binhai new area (Source:Yan Mi, AOKI Nobuo and Subin Xu, "The Study of Tianjin Binhai New Area Industrial Heritages," in The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress, 2012, pp. 1–9.)

The convergence of industrial heritage and new industries has become an important research topic in the process of industrial restructuring.[40] A general investigation of 36 important heritage in Binhai New Area was started.[41] Many industrial heritages were conserved in the protecting lists[42], while some others have not been included and unfortunately vanished in the large-scale urban regeneration, for example, the Compagnie de Tramways & D'eclairage de Tientsin, Sheng Hsi Foo Hat Co. Ltd. and Tianjin Soda Plant.

[39] For instance, the Northern navy dockyard Dagu is the earliest manifestation of Westernization Movement in northern China;Yongli Soda factory and Huanghai Chemical Industry Research Institute were set by the national industrialist Fan Xudong and scientist Hou Debang which are the earliest national chemical companies and research institutions of our country in modern times; China's first telegraph line which is the starting point of earliest sea postal line; The Tanggu station on Tangxu Railway which is the China's first standard railway construted by Chinese. See more in: Mi, Yan, AOKI Nobuo, and Subin Xu, "The Study of Tianjin Binhai New Area Industrial Heritages," in The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress, 2012, pp. 1–9

[40] *Ibid*. pp. 1–9

[41] This investigation is conducted by the International Research Center for Chinese Cultural Heritage Conservation in Tianjin University.

[42] Until the year 2011, there are 5 industrial heritages listed as protection units of cultural relics in the province level , while 4 industrial heritages were listed protection units of cultural relics in the municipal level. see more in Zheng Ying and Zhang Wei, "Reflections on the Conservation of Tianjin Modern Industrial Heritage," *New Architecture*, 2012, pp.49–53 <doi:10.3969/j.issn.1000-3959.2012.02.010>.

Chapter 3 Industrial Heritage in the Context Europe: Conceptual and Methodological Issues

Industrialization was one of the great events in history that changed the social and economic life of society, creating a common culture of production and behavior in European countries. When the deindustrialization swept through the Europe, they also faced the problems such as the empty buildings and plants, the outdated machines and the dismissed industrial areas. This transformation of industrial society had given rise to the discussion of industrial heritage, which evolved over the past one century and caught more attentions with a series of events from Europe to the other countries. At the end of 19th century, industrial archaeology was firstly risen in Britain[1], focusing on the recording and preservation of industrial remains originated industry revolution. This period can be seen as the germination of industrial heritage. The industrial monuments were not been interested in the international scale until the first International Congress on the Conservation of Industrial Monuments (FICCIM) was held in Ironbridge in 1973. TICCIH[2] (The International Committee for the Conservation of the Industrial Heritage) was founded in 1978, as the first world organization for research of industrial heritage. Since then, the study of industrial heritage stepped in the development period. TICCIH has been ICOMOS's specialist adviser on industrial heritage to assess industrial sites for the World Heritage List since 2000[3]. The Nizhny Tagil Charter[4], adopted by TICCIH at its XII Congress in Russia in 2003, is the international standard for the study, documentation, conservation and interpretation of the industrial heritage. With the International Day for Monuments and Sites in 2006[5], industrial heritage caught the international focus and had an equal importance with other cultural heritage which are often given priority. This period can be seen as maturity period. Recently, the TICCIH Congress 2012 in Taipei and the Taipei Declaration[6] awakened more attentions for industrial heritage in Asia for the first time.

Chronologically, the evolvement process of industrial heritage Europe can be divided into germination, development and maturity periods. Compared with China, it can be see an evolutional process from the industrial archaeology to the industrial heritage and now the reuse and industrial landscape. Such a transformation provides a comparative perspective for the Chinese industry heritage study. But at same time, to over-simplify this dynamic process in such a way, resulting of reducing the complicatedness in its implication and the plurality in its interpretation, is risk to hinder the further discussion and study. It is apparently that there was a "blank period" of more than 70 years, from the emergence of industrial archaeology at the end of 19th century to the first international congress on industry heritage. By reading this portion of time, we can find it is a very important period for the Europe countries in that the idea of industrial heritage had great improvement. The changes of ideas, which shaped its conceptual and methodological dimension of industrial heritage nowadays, finally

[1] http://www.industrial-archaeology.org/
[2] http://ticcih.org/about/
[3] www.icomos.org
[4] The Nizhny Tagil Charter was adopted TICCIH at its XII Congress in Russia in 2003, and is the international standard for the study, documentation, conservation and interpretation of the industrial heritage. http://ticcih.org/about/charter/ See more in the Appendix I
[5] http://international.icomos.org/18thapril/2006/18april2006-2.htm
[6] http://www.tdd.com.tw/ticcih/ see more in the Appendix II

leaded to the innovation of methodologies and the diversification of strategies applied for the protection and reuse of industrial heritage.

3.1 Evolution of Industrial Heritage's Conceptual Dimensions

3.1.1 Industrial Archeology: A Key to Understand of Industrial Heritage

The initial conscious regarding to the potential value of old industrial relic arose in Britain. As the world's first industrial nation, cities in Britain were at the base of the industrial revolution in the 19th century, while urban structure was based on the industrial division of labor and modes of production. When deindustrialization across many areas in Europe since 1960s, there was widespread disinvestment, dereliction, abandonment and social strike in former industrial cities[7]. In this transformation, clearance was a popular solution to most of industrial remains, such as the demolition of the Propyleum at Euston Station and the Coal Exchange in London[8]. All these led to the slow recognition of the value of these abandoned industrial buildings and sites in both professionals and public levels, and the demand of the industrial monuments survey and record.

Industrial archaeology was risen in Britain firstly as a new independent discipline in recognizing and rising to the challenge presented by decline industrial remains. The term *industrial archaeology*, popularized by Donald Dudley and Micheal Rix[9], was adopted quickly by the amateur and professional museum-based archaeologists in the late 1950s and early 1960s. Industrial archaeology brings together two contradictory terms: *archaeology* and *industry*. The "archaeology" of *industrial archaeology* is not primarily about excavation. The aim of industrial archaeologists is to identify structures, buildings and artifacts to ensure their preservation before they are demolished or destroyed.[10] Meanwhile, the word "industrial" is concerned with the remains of industrial activities. As Micheal Rix pointed out, the name given to the field is not so important[11], but what is more important is the study of the physical industrial remains, which distinguishes industrial archaeology from the other disciplines. He argued the industrial archaeology as "an investigation of the factories and mills which were built in the eighteenth and nineteenth centuries together with the steam engines and locomotives that made possible the provision of power, the first metal-framed buildings, cast-iron aqueducts and bridges, the pioneering attempts at railways, locks and canals and so on"[12].

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[7] Micheal Stratton, *Industrial Buildings: Conservation and Regeneration*, *Tourism* (London;New York: Taylor & Francis, 2000), p. 232.

8 *Ibid*, p. 11.

[9] Industrial archaeology was popularized by Donald Dudley of Birmingham University Extra-Mural Department early in the 1950s, and a case was made in print by Rix (1955) who was active with the Workers Educational Association in Birmingham on the study of the industrial monuments of the Black Country. From: Nicolae Hillinger, Martin Olaru and David Turnock, "The Role of Industrial Archaeology in Conservation: The Resita Area of the Romanian Carpathians," *GeoJournal*, 55 (2001), pp.607–630.

[10] Walter Minchinton, "World Industrial Archaeology: a Survey," *Industrial Archaeology*, 15 (2011), pp.125–136.

[11] Sophia Labadi, "Industrial Archaeology as Historical Archaeology and Cultural Anthropology," *Papers from the Institute of Archaeology*, 12 (2001), p.78. <doi:10.5334/pia.162>.

[12] Michael Rix, *Industrial Archaeology* (London: Historical Association, 1967), p. 25.

In the following years, the subject of industrial archeology has grown to a sub-discipline of archaeology accompanied implementation and policies for documenting, recording, and listing industrial archaeology in Europe.[13] After Kenneth Hudson published the first book on *Industrial Archaeology* in 1963, then other monographs on industrial archaeology also began to appear in various European countries. The term "*industrial archaeology*" had various forms[14], such as the term "*l'archaeologia industriale*" preferred in Italy, the French speak of "*patrimoine industriel*", the Germans of "*Industriearchaologie*", the Spanish of "*arqueologia industrial*". Thus industrial archaeology has been accepted and passed into the everyday language of the Europe countries.There are many reasons for the acceptance and spreading of industrial archaeology in Europe. Firstly, more and more industrial sites, which often located inside the city centers or near them, had been transformed into dismissed areas. It was needed to protect and enhance of urban landscapes with some professional knowledge and skills. Meanwhile, in some points of view, industrial archaeology suggests an alliance of particular histories based on artifacts, and a conceptual dimension as the archaeology of the industrial period. In bringing these two things together, industrial archaeology had soon became a popular key for understanding contemporary society.[15]

However, in its early days, industrial archaeology was limited to studying and recording the remains of the Industrial Revolution. The narrow sphere of industrial archaeology[16] resulted the limitation as the time limits of the subject and the ignored experience and organization of working life. Then some theorists dissatisfied with this definition of industrial archaeology. Kenneth Hudson argued that industrial archaeology should have a human face. He has emphasized the study of the structure or machine is not the end of the matter. On the contrary, they need to be considered in relation to the men who were concerned with them. On the social side, Palmer and Neaverson[17] suggested the industrial empire of the entrepreneur and the role of the individual in the creation of material culture also should be included in the social context of production. As a result, the categories of industrial archeology was widely extended.

Accompanied the evolution of the conceptual dimension of industrial archaeology and its methodology, the systematic national industrial heritage inventories and recording programs were also initiated in the worldwide. There are many national industrial heritage societies[18], such as the Association for Industrial Archaeology (AIA) in Britain, CILAC in France, AIPAI in Italy, and the Society for Industrial Archeology in North America. In terms of the organization type, generally speaking, there are two ways in

[13] Sophia Labadi, "Industrial Archaeology as Historical Archaeology and Cultural Anthropology," *Papers from the Institute of Archaeology*, 12 (2001), pp.77–85 <doi:10.5334/pia.162>.
[14] Walter Minchinton, "World Industrial Archaeology: a Survey," *Industrial Archaeology*, 15 (2011), pp.125–136.
[15] Judith Alfrey and Tim Putnam, *The Industrial Heritage: Managing Resources and Uses* (Routledge; 1 edition (March 13, 1992), 1992), p. 340.
[16] At first, the industrial archaeology concerned with the remains of industrial activities. Thus its industrial categories include: coalmining, the metal industries, the engineering industries, the chemical industries, building and agriculture. Rural and urban crafts and consumer industries including leisure and entertainment complete this list. The service sector and public utilities also merit inclusion. Power (animal, wind, water, steam, internal combustion and electricity) and transport (road, tramways and railways, water, air and their related structures and equipment) also fall within the canon. Then the subject was extended to include 'social archaeology': workhouses and gaols, housing for masters and men, places of worship, etc..Walter Minchinton, "World Industrial Archaeology: a Survey," Industrial Archaeology, 15 (2011), pp.125–136.
[17]See more in: Palmer M. and Neaverson 1998: Industrial Archaeology: Principles and Practice. Routledge, London. P.4.
[18] See more in the appendix III

which industrial archaeology is organized: The first is the centralized, bureaucratic, professional model; the second is the grassroots, mainly amateur, model. Of the former, there are many examples, in Australia, France, and the USA. Of the second, Britain, Italy, Belgium and the Netherlands are the main examples.[19] These society members bring together people interested in researching, recording, preserving and presenting industrial heritage.

3.1.2 Industrial Heritage: A Dynamic Concept between Conservation and Transformation

With the help of industrial archeology, the industrial remains were began to be understood and recognized in different ways. The emerging conservation conscious successfully made the most important industrial sites listed as an *Industrial Heritage Site.*[20]At the same time, due to the social, cultural, political and environmental pressure, the consideration of a new approach for the industrial heritage was evitable. As a dynamic concept, *industrial heritage* is always in evolution with the new situations.

From first used in the reconstruction of the Brooklyn Bridge by D.B. Steinman[21] in 1952, to the *FICCIM* held in Ironbridge,England in 1973, then the adoption of international standard about industrial heritage-Nizhny Tagil Charter, *Industrial Heritage* became an international term step by step, accompanied with the value of these industrial building and sites was recognized gradually. The conceptualization of industrial heritage is broadened widely. Now *industrial heritage* appears by itself but not as a part of other categories. In the wake of some losses, European Countries have begun to embrace the notion that the industrial heritage offers unique opportunities, viewing their values in a broad way.

The recognition of industrial heritage was started with the conservative preservation. In Britain, facing with more than two hundred years of declining manufacturing industrial sites, a long national survey was started and numerous valuable industrial heritage were listed for conservation. Meanwhile, the policies on reclaiming and recycling industrial land was also well established[22]. Then, British preservationists learned a lot from some lesson from USA, which have proved more successful in promoting through new commercial, retailing and cultural activities. They were taught how to attract mixed funding and large numbers of visitors, but most have taken a more purist line in terms of

[19] Walter Minchinton, "World Industrial Archaeology: a Survey," *Industrial Archaeology*, 15 (2011), pp.125–136.

[20] The Wieliczka Salt Mine (Poland) became the first site to be listed as an Industrial Heritage Site in 1978. The UNESCO list of World Heritage Sites contains today 890 world heritage properties (689 cultural, 176 natural and 25 mixed) considered as having outstanding universal value by the World Heritage Committee (UNESCO, 2010), of which over 60 related to old industry. See more in http://whc.unesco.org/en/list/

[21]The Reconstruction of The Brooklyn Bridge, Steinman, D.B. Columbia engineering quarterly,1952.p.3-9.In:UNESCO-ICOMOS Documentation Center. Industrial Heritage Bibliography.2006:14

[22] These policies include: The 1947 Town and Country Planning Act was the first legislation to require restoration of a mining site after closure. In the 40 and 50's, Parliament introduced the Derelict Land Grants (DLG) program that offered financial grants to assist in both private and public sector reclamation activities, focusing on the dangers and eyesores of mining and quarrying. In 1981, the Department of the Environment has begun awarding funds to projects that redevelop industrial, commercial and even residential uses. See more in Bodurow Rea and Constance Corinne, "Rethinking the Industrial Landscape: The Future of the Ford Rouge Complex," *Architecture* (Massachusetts Institute of Technology, 1991), p. 273.

architectural preservation.[23] From the emphasis on conservation, then on physical renewal and regeneration, and now to be upgraded within a much wider context, including social, economic, cultural and natural contexts, Britain is a pioneer in the protection and reuse of industrial heritage. It explores the way how projects can have an invigorating effect across transformation and promoting reuse. In other Europe countries, like France and Germany, also had similar problems, such as derelict structures, polluted lands and widespread unemployment. With the redevelopment of decline industrial sites, the French had changed this situation through a planned landscape treatment. In Germany, the Ruhr area is such a good practice. In just few years one of the largest deindustrialized areas of Europe has been transformed into a cultural metropolis. These new approaches to industrial heritage brought out the idea that the conversion of industrial heritage to new uses can also make a contribution to the economic and social development.

In Italy, as an inevitable consequence by both of global economic transformation and urban planning policies, the area with heavy industry still presented a decline, especially those which has traditionally been located in the northern industrial cities, such as Milan, Turin and Genoa. Take Milan as an example, the first signs of decline in its industrial sectors was already apparent at the end of the 1970s, then the restructuring of industries in the second half of the 1980s made it face many significant challenges.[24] However, in front of these abandoned industrial areas, reconstruction had generally prevailed but not saving them. Industrial heritage did not be recognized as valuable resource in public awareness at the beginning, there was limited interest in the industrial heritage.[25] The removal of the industrial remains had been adopted as an outcome of the urban regeneration. The Milan area was such example of the cancellation of significant industrial heritage.[26] Similar trends are still under way in other places, while industrial plant and works have been seen as an obstacle to be removed, rather than an opportunity to be developed. With new urban planning experiences, the industrial dismissal in Italy have been placed in the center of strategy gradually.[27] The renewal of Lingotto is such a typical case, arising much discussions in these years. Lingotto is a car factory built in 1916-1923 by Giacomo Mattè Trucco. It was celebrated in Le Corbusier's book, *Vers une architecture*, as an exemplar functional building with its sharp constructive system in reinforced concrete and the test-drive circuit on the roof (Figure 3-1). By transforming the abandoned factory to a shopping center and constructing of a new part realized in "Lingotto style",

[23] Stratton, Micheal, Industrial Buildings: Conservation and Regeneration, Tourism (London;New York: Taylor & Francis, 2000), p. 232.
[24] Anna Trono and Maria Chiara Zerbi, "Milan:The City of Constant Renewal," *GeoJournal*, 2003, pp.65–72.
[25] Massimo Preite, "Industrial Heritage and Urban Regeneration in Italy : The Formation of New Urban Landscapes," in *The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress*, 2012.
[26] In Milan, Seven millions of square meters of industrial areas have entered the market in three decades. The new PGT (Government Territorial Plan) in 2011, after 30 years since 1980 PRG (General Regulator Plan), has finally revealed the intention to recover and reallocate the existing buildings with new urban functions rather than taking up additional land, using mainly the abandoned railway yards. See more in Augusto Vitale, "Lights and Shadows on the Management of the Dismissed Industrial Heritage," *Journal of Technology for Architecture and Environment*, 2012, pp.97–101.
[27] Such good examples include: The new General Planning Scheme of Ivrea (2000), which extends protection norms to the 20th century industrial city which are similar to those envisioned for the city's old nucleus; The new plan to convert the foundation city of Carbonia (2006), which centers around a project to enhance the Serbariu mining site; The Urban Project (2005) for the Testaccio-Ostiense district (Rome) which exemplifies the intention of the General Planning Scheme (2000) to expand the perimeter of conservation from the "old city center" to the "historic city", including in this stratification expressions of the 20th century industrial city. See more in .Massimo Preite(AIPAI Vice President and TICCIH National Representative), *Reports from National Groups: ITALY(TICCIH National Reports 2012)*, 2012, pp. 107–119.

Renzo Piano reproduced the image of the past factory and showed the charm of industrial relics. (Figure 3-3)

Figure 3-1 The Fiat Lingotto roof with its testing track in action, as published by Le Corbusier in *Vers une architecture* to illustrate the fusion of engineering, speed and clean structure(Source:Gillian Darley, *Factory* (Hong Kong: Reaktion Books, 2003), p. 224.)

Figure 3-2 Interior of Lingotto after renovation. (Photo: Gianni Berengo Gardin, Massimo Limi. Source: Marcella Beraudo di Pralormo Carlo Maria Olmo, Michela Comba, *Le Metafore E Il Cantiere: Lingotto: 1982-2003* (U. Allemandi, 2003), p. 205.)

Figure 3-3 Overview of Lingotto in Turin. (Photo: Massimo Listri. Source: Carlo Maria Olmo, Michela Comba.)

In some case, the transformation of industrial heritage could be combined with the enhancement of the city memory. The project of the Eataly Centre was started in 2004 and completed in 2007. The old factory of traditional vermouth wine was reused as a multifunctional complex. It was divided into several thematic areas (such as cheese, meat, fruit and vegetables, fish, pasta and pizza, wine, beer), where there are specific points for food production and sale. There are also some educational and exhibition spaces, classrooms for cooking schools and library. Through enhancing the architectural urban feature of the interior, the industrial heritage became a source of enrichment for the city. Moreover, it provided a strong symbolic and spatial opportunity: to preserve the memory of Torino's food industry by experimenting new activities. (Figure 3-4Figure 3-5)

Figure 3-4 The Eataly Centre transformed from an old factory of traditional vermouth in Torino (Photo: by author)

Figure 3-5 The activities related to the food in the Eataly Centre (Photo: by author)

3.1.3 Industrial landscape: Considering Industrial Heritage as an Integral Part of Collective Identity.

In term of the category of heritage, it concerned only restricted categories, such as historical documents, works of art, monumental buildings and archaeological sites. Gradually, landscape, as a set of material structures that visibly express the interaction of past and ongoing ecological and social processes, had also been rightfully included in the category of heritage. With its interests shifted, the scope of heritage had been

enlarged from the single monument to the whole landscape. Based on these changes, new frameworks and strategies were developed[28] in order to highlight cultural heritage with the new notion of landscape. The category of the cultural landscape is defined as a cultural heritage site that represents the 'combined works of nature and man'[29]. Cultural landscape are "sites where the cultural identity and achievements of a particular society have been forged over time by interacting with their natural environment and where natural environment has itself been modified as a result".[30]

In recent years, industrial heritage also have been considered as an integral part of collective identity in the classification of the landscape.[31]. Industrial landscape was defined as "the landscape resulting from a thoughtful and systematic activity of man in the natural or agricultural landscape with the aim of developing industrial activities".[32] This definition enabled the scope of industrial heritage from the individual buildings or buildings group to an entire landscape. The concept of industrial landscape created a theoretical basis and a practical methodology both for the study and for the intervention in these landscapes.

While attempting to understand industrial landscapes and considering what their values might be, there are different approaches. For example, the industrialization of Turin began at the end of the 19th Century along the banks of the River Dora. The factories shut down in the general decline of the industry during the 1980s. They left a large area of urban dereliction in the city center, as well as traffic arteries and residential areas .An urban renewal program was launched in1998 to regenerate it as a park, which comprises five separate areas. The connection between the park's five areas and the links into the surrounding neighborhoods were an essential design strategy in the sustainable concept for the new park. Due to the positive inclusion of its industrial heritage, the Parco Dora signifies a new understanding of urban landscapes that reflects the transition of society[33]. (Figure 3-6)

[28] We can see this development from the following achievements: the introduction of "Cultural landscape" among the categories considered for inclusion in the UNESCO World Heritage List, in 1992; the evaluation of landscape as a "basic component of the European natural and cultural heritage, contributing to human well-being and consolidation of the European identity" in the European Landscape Convention (2000); the issue of a new general "Code for Cultural Properties and Landscape" by the Italian government in 2004. Paola Pressenda and Maria Luisa Sturani, "Open Air Museums and Ecomuseums as Tools for Landscape Management: Some Italian Experiences," in *Ecomuseums：A Sense of PlaceA Sense of Place* (Continuum International Publishing Group, 2011), pp. 1–16.

[29] It is defined in the UNESCO Operational Guidelines http://whc.unesco.org/en/convention/

30 Dennis Rodwell, *Conservation and Sustainability in Historic Cities* (Oxford, UK: Blackwell Publishing Ltd, 2007), p. 272 <doi:10.1002/9780470759547>.

[31] Cliff Tandy and Peter Nelson, *Industria Y Paisaje* (Instituto de Estudios de Administraci ón Local, 1979), p. 386.

[32] Hans Wieser-Benedetti and others, Le Paysage de L'industrie: R égion Du Nord, Wallonie, Ruhr, Du 10 Au 31 Octobre 1975, École Nationale Supérieure D'architecture et Des Arts Visuels (Éditions des Archives d'architecture moderne, 1975), p. 198.

33 Michele Bonino, "Parco Dora，Torino，Italy，2004-2013," *WORLD ARCHITECTURE*, 05 (2013), 48–57.

Figure 3-6 The park of Vitali in Parco Dora (Photo: Ornella Orlandini; Source: Bonino, Michele, "Parco Dora, Torino，Italy，2004-2013," WORLD ARCHITECTURE, 05 (2013), 48–57)

Another example can be illustrated in the regeneration of the former Falck steelworks area in Sesto San Giovanni, Italy. As a 20th century industrial town in North Milan, Sesto San Giovanni was a location for steel production and heavy industry traditionally. The steel plant of Falck located in this town belonged to one of Italy's leading industrial companies. During the 1980s and 1990s, the unemployment in Sesto San Giovanni was very heavy, while it was officially designated e as a zone in decline by the state.[34](Figure 3-7) Meanwhile, the urban-industrial system of Sesto San Giovanni, including the Breda area, the Campari area and the Falck area, was nominated in the list of World Heritage Site selected by UNESCO.[35] How to deal with the requalification and transformation of this area in the list of World Heritage Site became a challenge. A large-scale park named "Beyond the Walls of Falck" was envisioned by Renzo Piano.(Figure 3-8; Figure 3-9) In this project, in aim of protecting the memory of this place, the main industrial buildings would be conserved. In particular, the steel-works with huge scale, will be safeguarded and remain as area of industrial archaeology, but not for reuse. Moreover, there are plans for "excavations" in the grounds to reveal the foundations where the machinery and equipment of the steel-works rested[36]. Besides, there also would be hyper-technological skyscrapers to house universities, research centers, public administration offices etc.

[34] Unemployment rose from negligible levels to over 10% of the workforce, steel production at Falck was eventually abandoned in 1995 and the industrial areas and sites of Sesto entered into a period of decline and dereliction as the town faced a major economic crisis. Report of an international seminar held in Kharkiv, *Industrial Restructuring and Enterprise. Development in the City and Region of Kharkiv,UKRAINE*, 2005, pp. 12–13.

[35] According to Massimo Preite, The proposal for its inclusion on the Unesco List is based on the following criteria: criterion III (offering unique evidence of a cultural tradition) ; criterion IV (offering an eminent example of a type of construction or architectural, technological, or landscape assemblage); and criterion VI (being directly or physically associated with living events or traditions); Massimo Preite, "Industrial Heritage and Urban Regeneration in Italy : the Formation of New Urban Landscapes," in The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress, 2012.

[36]Massimo Preite, "Industrial Heritage and Urban Regeneration in Italy : the Formation of New Urban Landscapes," in The XVth International TICCIH (The International Committee for the Conservation of the Industrial Heritage) Congress, 2012.

In this case, although there are still some controversial debate, the industrial heritage is not considered in isolation but in a landscape that interprets and gives historical references. Combining conservation and transformation, Renzo Piano's plan represented a critical reuse and cultural integrating, which reveal the industrial landscape though the material evidence. Such a model of regeneration within industrial landscape will not forget its history, including the history of men and communities, the history of institutions and regimes, the history of employers and workers, the history of companies and trade unions, corporatism and insecurity etc.

Figure 3-7 Sesto S. Giovanni, before the regeneration (Source: Alessandro Casati, *Industrial Heritage in Sesto San Giovanni: A Real Asset for Urban Development*, 2012, p. 15.)

Figure 3-8 In 2006, Renzo Piano was entrusted with the urban planning of the former Falck steelworks area (1,5 million sq m.), with the drawing up of a master plan, a new central green area of half a million sq m. Inside this park, residential buildings (a commercial center) and steel cathedrals, reminding the industrial past of Sesto S. Giovanni.(Source: Alessandro Casati, Industrial Heritage in Sesto San Giovanni: A Real Asset for Urban Development, 2012, p. 15)

Figure 3-9 Sesto San Giovanni (Milan),"Oltre il muro della Falck" (Beyond the wall of Falck, former steel plant), an exhibition (2006) showing the architect Renzo Piano's urban project to re-qualify the Falck area.（Source: http://cerchioli.photoshelter.com/image/I0000B_D3AsRly3E）

3.2 Enhancing the Value of Industrial Heritage in Multiple Methodologies

In terms of innovative strategies for heritage value enhancement, a conventional logic may be these large investments and big events. However, when globalization has cleared difference generated by regional resources and local specifies, it is important to find a proper way for regional economies and identities. Patrimonialization has been development with requirements for local development strategies and the enchantment of local identify in Europe.

Before exploring the possible strategies for the valorization of industrial heritage, it is necessary to clarify the essential meanings of two important concepts, *Patrimony* and *heritage*. They are two similar concepts, but different in some degree. In the past several decades, the French concept of patrimoine (usually translated as "heritage" in English) has devolved from the personal legal realm of kinship inheritance to the national or even wider cultural realms of heritage.[37] In this sense of, heritage is a part of identity. Meanwhile, the concept of patrimony may be defined as the group of elements that inherit their characteristics from past and present them in nowadays in a continuous way[38]. Comparing with the concept of heritage which pay more attention in its preservation, the concept of patrimony focus more the present in basis of the past. In this sense, the patrimonialization is a process about the recognition of values in a critical way, but not limitied to the past.In term of those older industrial areas in decline,

[37] Nezar AlSayyad, Consuming Tradition, Manufacturing Heritage: Global Norms and Urban Forms in the Age of Tourism (Routledge, 2001),p.70.
[38] *Ibid*,p.70

patrimonialization may contribute to economic renewal, as it offers chances for local development [39]. It can bring about positive consequences, such as growth of employed population and incomes, enhancement of local attractiveness and cultural development.[40]

Since the patrimonialization expresses that it is important to promote industrial heritage in a perspective of local development, there are some question emerging: to what extent can these industrial heritage be conserved and transmitted without upsetting its identity? How are local actors rallied around a project for the promotion of their industrial heritage? Among the answers, industrial heritage tourism and ecomuseum are thought as possible ways promote the valorization of industrial heritage in the perspective of local development, while the regional collaboration like ERIH presents another possibly in the territorial level.

3.2.1 Exploiting Industrial Heritage with Tourism

Tourism economy model, which took the opportunity of a broadening of interest in history and the arts since the 1960s, was occasionally applied to instead the traditional museums and art galleries in Britain[41]. As a strategy for local development, its potentiality was recognized and highlighted widely in European countries in the following years. The reason is that the local identity could be enchanted by the promotion of the local industrial past.

The Ruhr area district management council of this area had drawn a line of industrial heritage tourism, including 19 sites, 6 national museums for industrial technology and social history, 12 typical clusters and 9 watchtowers converted from wasted industrial facilities.[42] (Figure 3-10) Among them, there were three types of attractions for the industry heritage tourism. The first type were these workplaces have been restored and into museums demonstrating the history of industrial occupations. Some industrial monuments are transformed to show visitors the “aesthetics of deindustrialization” (Figure 3-11, Figure 3-12). The second type were the transport facilities, including industrial legacies in the field of rail, water and roads aiming to show a transport experience (Figure 3-14). The third part was about the exhibition of former working-class houses and employers’ estates, which associated with a particular industrial past (Figure 3-13). Industrial heritage, as an emerging heritage, became a new interest for the tourism, especially during the 1990s, due to experiences with industrial heritage tourism in the Ruhr area[43]. The strategy of industrial heritage

[39] Gert-jan Hospers, “Industrial Heritage Tourism and Regional Restructuring in the European Union,” *European Planning Studies*, 10 (2002), pp.397–404 <doi:10.1080/09654310220121112>.

[40] Roberto Parisi, “Progettare Patrimoni Nel Terzo Millennio . Rovine d ’ Industria e Istanze Di Riuso Tra Congiunture , Bilanci e Passaggi Di Testimone,” *Patrimonio Industriale（rivista AIPAI）*, 2011, pp.4–5.

[41] In Britain, cultural tourism really took off in the 1960s and 1970s. Shorter working hours and rising incomes were matched by a broadening of interest in history and the arts. But the traditional museums and art galleries were slow to respond to this growth. Instead a new breed of museum emerged, Industrial heritage tourism was motivated by the decline of traditional industries areas. see more in Stratton.p.232.

[42] LIU, Huiyuan, & LI, Leilei (2007). Industrial Tourism and Protection of Industrial Heritage in Germany. Beijing: The Commercial Press.

[43] This Ruhr Tour-program was set up by the Emscher Park International Building Exhibition (IBA) (1989–1999) and is currently managed by the local government, the Ruhr District Association of Communities (KVR). See more in Hospers.p.398.

tourism was adopted as an effective tool to solve the problems that declining industrial areas encounter in the inevitable transition to a global service economy[44].

Figure 3-10 On the "Route of Industrial Heritage" opened in 1999 in Ruhr area， tourists can visit 19 important settlements representing the region connected and can be reached by different forms of public transport. (Source: photo taken by author, in the Duisburg North Landscape Park, Germany, 2013)

Figure 3-11 Schupp and Kremmer's pithead buildings and headgear at Shaft 12, Zeche Zollverein, Essen-Katernberg, Germany, representing the past image of Ruhr coal and attracting visitors. (Photo: by author)

[44] Hospers, Gert-jan, "Industrial Heritage Tourism and Regional Restructuring in the European Union," European Planning Studies, 10 (2002), 397–404

Figure 3-12 Coking plant and the pool(used for ice-skating rink in winter) in Zollverein, Essen-Katernberg ,Germany. (Photo: by author)

Figure 3-13 Permanent exhibition in Zeche Zollverein, Essen- Katernberg,Germany, telling the industrial past of Ruhr area with variety of collections (Photo: by author)

Figure 3-14 The railways in the Duisburg North Landscape Park in Germany, preserved from the former Duisburg-Meiderich steelworks. (Photo: by author)

Encouraged by successful experience of Ruhr area in Germany, more and more regions in Europe had turned to industrial heritage tourism as new tool to promote the value of industrial heritage and the local economy. In France there are over 1400 industrial heritage projects, including heritage museums and industrial bases. These projects attracted 20 million passengers annually.[45] But not all the industrial areas can offer all types of attractions like Ruhr, in other regions, such as those in France and Spain, exploit only a few of them.

We can also find numbers of useful methods for the industrial heritage tourism. One of them could be the integration of diverse interests: a tourist to Venice's Arsenal is not only looking for industrial heritage but also the exhibition and art activities housed in the buildings; A tourist visiting the Gasometer in Oberhausen is also interested in the art exhibition(Figure 3-15). The involvement of artists and entertaining activities often can enhance the attractions for the public. Besides, educational aim is another possible effective way to be added, which can reinforce their political credibility by responding to the demands of school groups (Figure 3-16).

[45] CHEN, Yuanfu (2012, May 13th). The Value and Exploitation Ideas of Industrial Heritage. China Tourism News.

Figure 3-15 The Gasometer Oberhausen and the installation named Big Air Package by contemporary artists Christo with Jeanne-Claude. This former gas holder in Oberhausen, Germany, has been converted into an exhibition space. (Photo: by author)

Figure 3-16 A group of students visit the renovated rice mill in Vercelli, Turin, Italy (Photo: by author)

However, because the values of these industrial heritage are not recognized much by the tourists in reality, there are some critics on this pattern of tourism. In the words of

Hudson, "There is no guarantee that a tourism based on nostalgia for a departed industrial past will prove more attractive to consumers than one based on sun, sea, and sand in southern Europe".[46] Otherwise, some industrial heritage tourism projects pay too much attention to tell the 'good old days' in the aim of catering the tourists, but ignoring the values of these industrial heritage. Anyway, with an increasing number of declining industrial regions in Europe, restoration and exploitation of former industrial landscapes for tourism purposes had gained popularity. Industrial heritage tourism meet the both demands for leisure in the public level and the communication of industrial heritage values in the professional level.

3.2.2 Managing Industrial Landscape with Ecomuseum

While the industrial heritage tourism were flourishing in Europe, it was a challenge for the industrial museum to attracting more visitors. The idea of ecomuseum was conceived in such a background with the aim of presenting the industrial heritage in more dynamic and appealing ways. This new concept was defined by the French ethnologist G.H. Rivial, who concentrated the ecomuseum on the "relationship between a given population and its environment, interpreted in the contemporary situation, but also on the historical evolution and with a critical awareness of future developments".[47]

The emergence of these developments of industrial museum can be seen as a result by the new demands. In the 1970s, a number of new-generation museums had begun attempts to present their objects in different ways in the context of Europe. In Britain, with the patterns of local involvement, local museums successfully manage the heritage through using real resources such as oral history, manuals, patterns and videos[48]. The open-air museum[49], combining learning and entertainment, was another typical example to represent the past life with creative methods instead of traditional ways. The conventional boundaries between museum and environment had begun to disappear. These new directions helped to form the new representation and interpretation of industrial heritage, such as on-site preservation and collections of artifacts ranging from industrial goods to houses, factories and even the whole setting.[50] After the ecomuseum of Le Creusot-Montceau-les Mines in Burgundy[51] was established in the early 1970s in France, then there was a considerable increase in the number of ecomuseums in the 1980s. Taking Italy as example, the ecomuseum model was recognized since the Piedmont regional laws for ecomuseums was issued for the first time in 1995. Later, the other province passed similar measures. Then the idea of

[46] Husdon, R. (1994) Institutional change, cultural transformation, and economic regeneration: myths and realities from Europe's old industrial areas, in A. AMIN and N. THRIFT (Eds) Globalization, Institutions, and Regional Development in Europe, pp. 196–216. Oxford: Oxford University Press.
[47] Rivière, G. H. (1985). Définition évolutive d'écomusée. Museum, 37,pp.182-183.
[48] Alfrey, Judith, and Tim Putnam, The Industrial Heritage: Managing Resources and Uses (Routledge; 1 edition (March 13, 1992), 1992), p. 340
[49] The open-air museums are inspired by the Skansen prototype which founded in Stockholm in 1891. Now they largely widespread in northern Europe. The direct experience of past life that is realized in these settings, which makes it possible to reach a much wider public than that of traditional museums. See more in: Pressenda and Sturani.p.4.
[50] Alfrey, Judith, and Tim Putnam, The Industrial Heritage: Managing Resources and Uses (Routledge; 1 edition (March 13, 1992), 1992), p. 340
[51] In Burgundy, marked by a lengthy industrial history and by the first signs of the waning of these activities, there were the question of unemployment and the need to identify new development strategies, while at the same time safeguarding and managing the material and non-material heritage of the industrial tradition. see more in: Pressenda and Sturani.p.4.

ecomuseum was popularized and brought into operation. There are more than 100 ecomuseums in Italy now.

"Ecomuseum of Biella Province" [52] is such a case in Piedmont Region in Italy. The route links Biella to Borgosesia has been called "The Road of the Wool" for several centuries. It starts from the Strona and Sessera valleys where textile industrialization was born, and reaches Borgosesia where an old wool market located. Along the route, there is an abundance of historical industries with diverse characteristics in terms of building typology and their state of preservation. By integrating these elements, it characterize the "wool landscape". This route are constituted by ancient woolen mills, infrastructures connected to them, workmen's dwellings, old water channels, the "path of workers" , and the hoot of factory whistles. The Factory of Wheel (former Zignone wool mill) constructed in 1878, as the symbol of industrial heritage in Biella area, is preserved and renovated as an important museum of Biella Province.[53] Then it became the center of the whole route, housing the functions of exhibition and education. With the building of ecomuseum, the industrial landscape is preserved and displayed to the public with new temporal and spatial system

Figure 3-17 The Factory of the Wheel (former Zignone wool mill) ， renovated as a note in the "Ecomuseum of Biella Province", Piedmont Region (Photo: by Dario Lanzardo)

[52] It was planned by DocBi (Centro studi Bielessi), in collaboration with Politecnico di Torino. www.docbi.it/

[53] Roberto Parisi and Manuel Ramello, Percorsi Del Patrimonio Industriale in Italia: Catalogo Della Mostra Realizzata Dalle Sezioni Regionali AIPAI in Occasione Del XIII Congresso Internazionale TICCIH 2006 (CRACE, Centro Ricerche Ambiente Cultura Economia, 2008), p. 158.

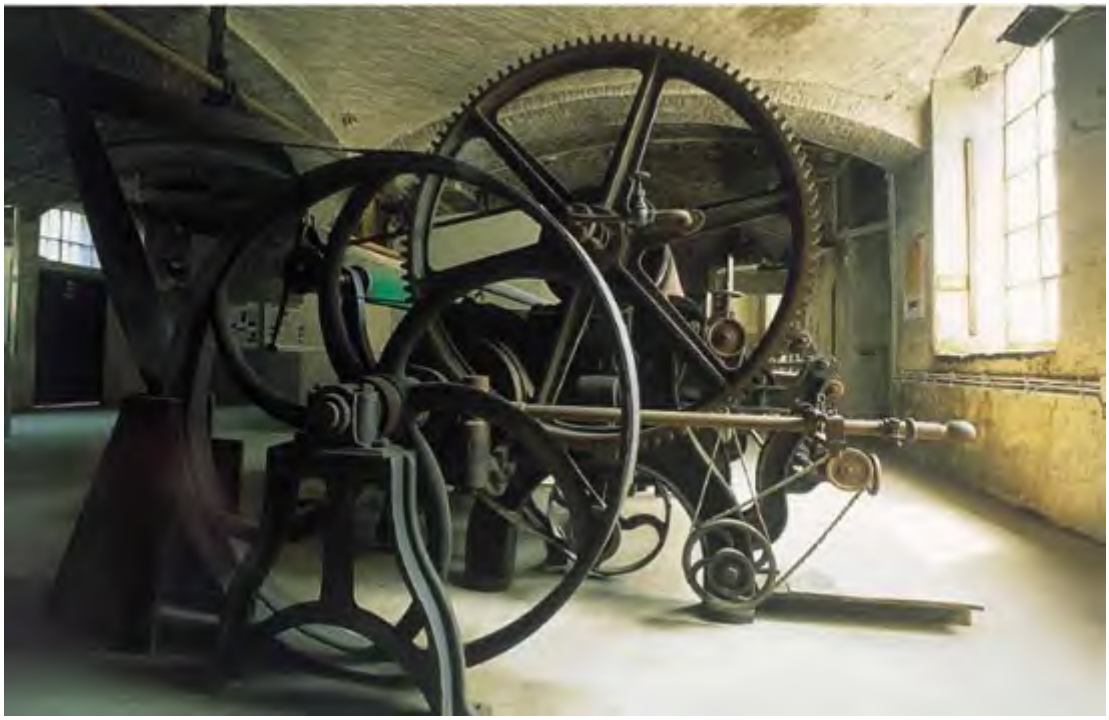

Figure 3-18 one of the machines conserved in the Factory of the Wheel (former Zignone wool mill), Piedmont Region (Photo: by Dario Lanzardo)

3.2.3 Trans-border Collaboration

When the industrial heritage tourism and ecomuseum were popular in the local level, they also became a foundation for the transformation from isolated protection of industrial heritage to trans-border collaboration. By building common standards and creating regional and thematic routes, this network connected different places with industrial heritage in Europe, and now it is extending internationally.

"Route lndustriekultur" in the Ruhr region in Germany was a good start which have begun the collaboration in the regional scale. The metamorphosis of the Ruhr Area began with the International Construction Exhibition (IBA) project from 1989 to 1999: Former industrial wastelands were saved from dereliction and transformed into witnesses to industrial history; Decommissioned mines and mine buildings served as venues for music, dance and theatre; Former production facilities provided space for leisure and relaxation. At the end of ten years of activity, the IBA created this "Industrial Culture Route".[54]

[54] The IBA project has an important impact through media event to generate structural changes in the Ruhr region. Starting with the renewal of garden cities like Welheim near Bottrop (1913-23) or the conversion of the adjacent Prosper III colliery site into a residential area, the IBA ended with a couple of exhibitions at the former colliery Zollverein XII in Essen, or "The Wall" by Christo and Jean Claude, staged inside the former gasholder of the GHH ironworks in Oberhausen. The former colliery Zollern II/IV in Dortmund, the blast furnaces at Duisburg-Meiderich, or the blas engine hall in Bochum are playing the role of territorial land-mark, places of memory and culture and "anchorage" point on the "Industrial Heritage Route". See more in Alexander Kierdorf and Norbert Tempel, *Reports from National Groups: GERMANY(TICCIH National Reports 2012)*, 2012, pp. 91–99.

Figure 3-19 Map Anchor Points of the European Route of Industrial Heritage (Source: http://www.erih.net/anchor-points/map-anchor-points.html)

Along with the well-established IBA project, a touristic promotion of industrial heritage had been done by a growing number of regional networks. The successful experiences of recovery on a regional scale, including the promotion of cultural tourism marketing, environmental sustainability and reconstruction of identity and image of the place, encouraged the European Route of Industrial Heritage (ERIH) to be founded in the European level. The ERIH was established to, in its words, "protect Europe's industrial heritage sites and use their preservation as a motor for the development of regions that are often suffering from economic decline." [55] It is a tourist network of important industrial sites, which leads through European countries like Britain, France, Italy, Germany, the Netherlands, Belgium and Luxemburg.[56] This route system contains anchor points and major industrial monuments within each itinerary. There are ten themed routes encompass areas that made their reputations from textiles, mining, iron and steel production, energy, transport, and industrial landscapes. The regional routes can guide visitors to sites within a defined area. In addition to highlighting specific buildings or factories, web-based information highlights points of local interest surrounding sites or in the area to encourage tourism, the route also

[55] http://www.erih.net/topmenu/about-erih.html
[56] *Ibid*

created a virtual library to facilitate research among organizations and academic institutions involved with preserving and disseminating information about these sites.[57]

It could say that industrial heritage always plays a central role when the European countries who are dealing with these industrial remains throughout the social and economic programs. At the beginning, due to the lack of interest to conserve industrial remains, it often leaded to the demolition and destruction before any conservation and reutilization. Then with the help of some successful reuse projects in innovative methodology, it was realized that the reuse of industrial heritage was not only a sustainable act but also an economically advantageous one. The industrial heritage has gone from a specific interest in the monument (the individual building or a single machine) to the industrial sites (including the machines, buildings and its infrastructure), then to the whole industrial area and industrial landscape.

[57] Carol Berens, Redeveloping Industrial Sites: A Guide for Architects, Planners, and Developers, 1 edition (John Wiley & Sons, 2010, 2010), p. 256.

Chapter 4 Methodology for the Reuse of Industrial Building -- Case Study: 1933 Old Millfun, Shanghai

4.1 INTRODUCTION

1933 old Millfun, an abattoir built in the year of 1933, was originally intended for slaughter. After being abandoned and falling into disuse, the buildings were served a number of purposes over the years from medicine factory, storage facility, and later listed as the *Excellent Historical Building* in Shanghai. There were the restoration and renovation from 2006 to 2008. The abattoir was reused as spaces for creative industry, such as conference, exhibition, banquet and office. This successful transformation shows how the protected industrial heritage can be renovated and rehabilitated with the new uses.

Figure 4-1 The location of 1933 Old Millfun in Shanghai (Source：Google Earth)

Figure 4-2 The site of 1933 Old Millfun (Source：Google Earth)

4.2 Research Method

This research takes 1933 Old Millfun as a case study, including the historical research on the realization of architecture and the reuse methodology research on the renovation project. The aim of historical research is to reveal the original designs and construction process of Shanghai Municipal abattior, such as the original function, original architectural space, original material and original technology. It is based on a large number of documents, especially the architectural archives from Shanghai Municipal Archives, including information of location, design process and construction method. With the documentary study, the research is mainly concerned with four fields, namely project management, site selection and technical inquiry, functions and circulations, architectural form and spatial composition, and structural characteristics. All these explain the significance of architecture, its particular sensitivities and characteristics in the managing and protecting. As a re-recognition process, the historical research also provide a knowledge basement to check the reuse in terms of the authenticity and identifiability.

The temperament of the original space and the function of the abattoir "as a machine"[1] have been represented and illustrated by the architect. As the function was changed and many of the parts of the abattior were already damaged, the reuse project demolished the damaged parts and reinvigorate the abandoned buildings with new uses in term of creative industry. The reuse methodology research focuses on how to reuse the industrial building listed as architectural heritage. As a typical industrial heritage reuse project in China, the strategy and methodology used for 1933 old millfun are deserve to be read in details. The main research methods are included of reading the drawing of reuse, on-site investigation, interviewing the architects who design it and the users and visitors who use this architecture.

4.3 Literature Review

Regarding the historical data of 1933 old millfun, generally speaking, it is not abundant. As the original abattoir, it has not much recording value due to its particular function. However, benefited from the status of official architecture of the Shanghai Municipal Committee, this abattoir still has certain research basis. Its project approval, design, and construction were all developed under the management of the Municipal Committee, and some of its original data can be found in Shanghai Municipal Archives.

The abattoir was proposed to be constructed in 1921 and put into use in 1934; the time in between was 13 years. The early stage construction work was often interrupted by discussion process, so the data is scattered, which has no coherence. Among these scattered materials，there were three critical documents for the historical study. The first one is a description[2] made for the project in 1930. It is the basis for understanding the various details regarding the architecture and the technological process of abattoir. The

[1] The architect of 1933 Old Millfun reuse project, ZHAO Chongxin, views the whole architecture as a reinforced concrete machine designed as per slaughtering technology. ZHAO Chongxin, "Reconstructing of 1933 Old Mill," *Architectural Creation*, 2008, 50–56.

[2] See more in the Appendix VII. Shanghai Municipal Archives, A description of the acceptable layout for the Shanghai Municipal Abattoir (Sawjin Road Abattoir), archive NO.U1-14-2392, 1924-1935.

second is general description of construction[3] in English language made in 1931, which recorded the construction materials and technology requirements of the abattoir.[4].HE Wei and ZHU Xiaomin's paper "An 80 year's old construction report- interpretation on the archives of Shanghai Municipal Council Abattoir"[5] present in detailed materials and construction technology used in abattoir based on this collection of documents. The third one is the document of design scheme drawing finished in 1930[6].

In HE Wei and Prof.ZHU Xiaomin's "A Research on the Architectural Archives of the Shanghai Municipal Council Abattoir"[7], they read large amount of correspondents and letters (in Chinese and English) in this discussion process, systemized and sorted it as per time sequence into consistent document, supporting it with relevant social and historical background data. This paper offers an exact historic context of the abattoir as an outstanding modern reinforced concrete industrial building in Shanghai. Before their research, most of introduction on this abattoir were narrow limited to few points: construction by the funding of The Municipal Committee, designed by British architect Balfours, and built by Ah Hong & Co. They proved that the designer of abattoir was architect A.Carr.Wheeler, who worked at construction section of Shanghai Municipal Council Public Works Department.

Regarding the reuse, as the architect of 1933 Old Millfun reuse project, ZHAO Chongxin published three articles, including "Reconstructing of 1933 Old Mill" [8] ,"Reconstructing of 1933 Old Mill" [9] ,and "Change, Platform and Regeneration-reconstruction process of 1933 old building in diagramic representation"[10] . They are the main literature on the introduction of the ideas of renovation process and the reuse strategies for the old buildings with cultural and commercial values. CHEN Haipen is another architect in reuse project. In his "The restoration of 1933 old millfun" [11], the principals and the methods used in the restoration are discussed. Before the renovation in 2006, the inspection and assessment for the structure of abattior were carried out by the Shanghai Academy of Building Research in 2006. The main works are described in the "Inspection and Assessment of 1933 Old Millfun in Shanghai" [12], including architectural and structural recheck, material strength inspection , damaged degree investigation , settlement and deformation measurement , structural safety assessment , seismic appraisement , strengthen and restoration suggestion. Besides, NIE Bo's paper "On Preservation and Rehabilitation Of Modern Concrete Industrial Buildings in Shanghai(1880-1940)-Case

[3] Shanghai Municipal Archives, Interpretation for the Abattoir CAD.LOT.330 specification of labour and materials for the construction of the lairage and slaughter sections, archive NO.U1-14-2397, 1924-1935.
[4] Shanghai Municipal Council Public Works Department would provide such kinds of description while conducting construction bid for its architectures with certain scale
[5] HE Wei and ZHU Xiaoming, "An 80 Years Old Construction Report- Interpretation on the Archives of Shanghai Municipal Council Abattoir," in *Survey,Research and Conservation of Chinese Industrial Architecture Heritage*, 2011, pp. 330–338.
[6] The original document of design scheme drawing of Shanghai Municipal Abattoir is reserved in private and unpublished.
[7] HE Wei and ZHU Xiaoming, "A Research on the Architectural Archives of the Shanghai Municipal Council Abattoir," *Time Architecture*, 2012, 108–113.
[8] ZHAO Chongxin, "Reconstructing of 1933 Old Mill," Architectural Creation, 2008, 50–56
[9] ZHAO Chongxin, "1933 Old Mill," *Architectural Journal*, 2008, 70–75.
[10] ZHAO Chongxin, "Change, Platform and Regeneration-Reconstruction Process of 1933 Old Building in Diagramic Representation," *Industrial Construction*, 38 (2008), 04–19.
[11] CHEN Haipen, "The Restoration of 1933 Old Millfun," *URBAN CONSTRUCTION*, 70 (2010), 299–300.
[12] LIU Huabo, WANG Hongnan and ZHU Chunming, "Inspection and Assessment of 1933 Old Millfun in Shanghai," *Construction Technology*, 2010, 104–106.

Study on Rehabilitation of the Abattoirof S.M.C.P.W.D (1933 Old Millfun)"[13], chooses the rehabilitation of 1933 Old Millfun as the case for study, observing the protection and regeneration tactic through various perspectives. He also discusses the renewal pattern, design details and the possible technology that can be used for industrial heritage.

Figure 4-3 Shanghai Municipal Abattoir in 1937（Source: Shanghai Municipal Archives.）

Figure 4-4 Shanghai Municipal Abattoir in 1937（Source: Shanghai Municipal Archives.）

[13]NIE Bo, "On Preservation and Rehabilitation Of Modern Concrete Industrial Buildings in Shanghai(1880-1940)-Case Study on Rehabilitation of the Abattoirof S.M.C.P.W.D (1933 Old Millfun)" (Tongji university, 2008), p. 300.

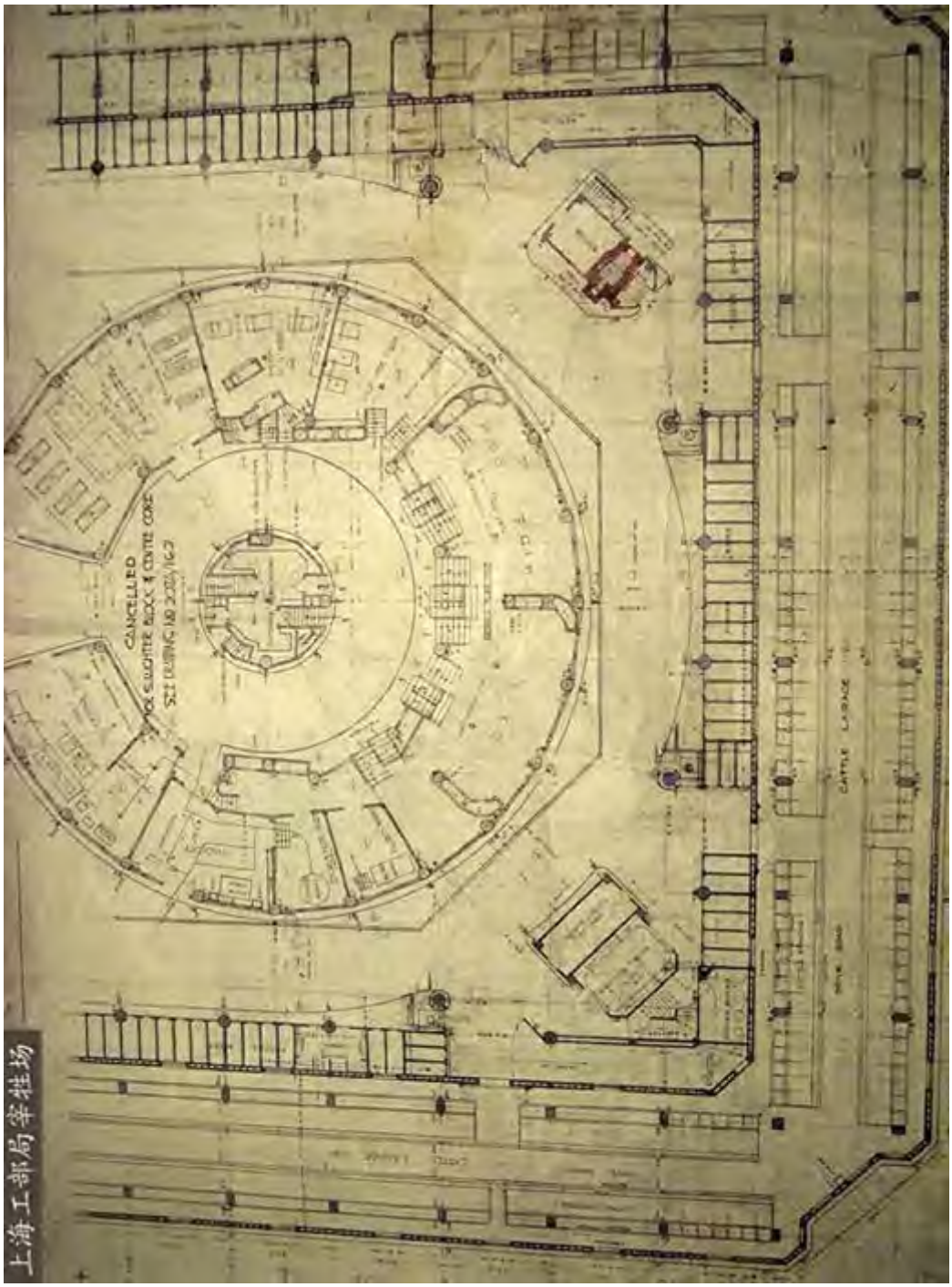

Figure 4-5 The original plan of the Shanghai Municipal Abattoir (Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html)

4.4 Case Study Analysis: Historical Research on the Realization of Architecture

4.4.1 The Project Management and Organizations

The construction of abattoir was mainly related to three departments: Shanghai Municipal Council Public Works Department, Health Office and Finance Department. In particular, the Public Works Department was a department that took charge of all basic municipal construction and construction management, and also the most important department closely related to construction activity in Shanghai Municipal Council; The Health Office was a public institution that participated in the formulation and implementation of construction laws and regulations related to public health, and managed and operated affairs related to health such as abattoir; The main job of Finance Department was to provide financial support. The responsibilities were shared in the following way: the Health Office put forward design specification such as requirements of function and scale; the Public Works Department took charge of the design, engineering bidding, construction supervision and equipment installation bidding; the Finance Department carried out check and approval on the funds needed in construction (Figure 4-6).

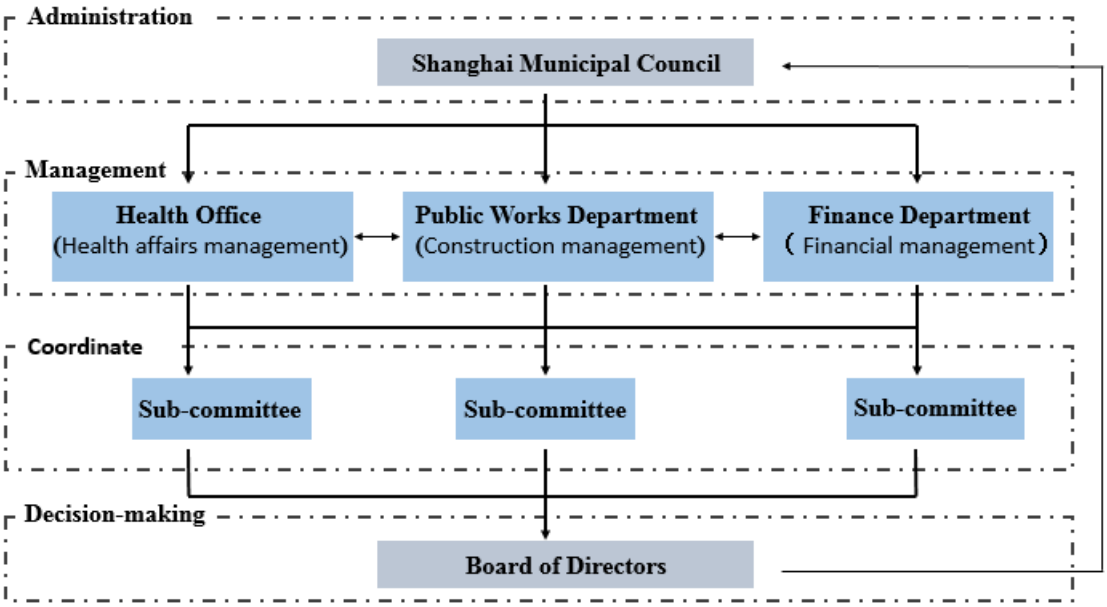

Figure 4-6 Organization structure regarding the management of the abattoir project (Source: by author, according to HE Wei, and ZHU Xiaoming, "A Research on the Architectural Archives of the Shanghai Municipal Council Abattoir," Time Architecture, 2012, 108–113)

Moreover, such three departments needed to consult their respective sub-committees and coordinate concrete affairs. Besides some important affairs needed to be submitted to the Board of Directors for decision-making, various departments should provide enough specialized information and suggestions to the Municipal Council for the reference and decision-making. The Municipal Council needed to offer coordination

basing on public benefit, so as to guarantee various participators have clear understanding on concrete development. Such organization and decision-making process made the design requirements of architecture continuously change with the judgment of various departments on various aspects, and it took over 10 years from project determination to completion.

On May 1931, Shanghai Municipal Council Public Works Department held the inviting bids of construction for the new abattoir. Ah Hong & Co.[14] won the bid. Then both parties signed the construction contract of the abattoir, and the contract regulated that Ah Hong & Co. need to finish the project within 30 months, before Nov 19, 1933. However, in fact, the progress was very rapid; the second storey of four-storey building was completed in Oct 1931. In Jan 1932, the project was temporarily stopped[15]. Shanghai Municipal Council Public Works Department and Ah Hong &Co. signed one *Statement* on May 20, 1931. Such *Statement* was one main attachment of the contract between Shanghai Municipal Council (Party A) and Ah Hong &Co. (Party B), which was expressed in image and text, totaling 106 articles 10 sections.[16] The project was divided into 14 sub-project bidding contracts through public bidding, and Ah Hong &Co. undertook the biggest sub-project: major structure construction. As there was no state construction and acceptance standard at that time in China, such document was essential and also exerted legal effect.

Ah Hong &Co. had proficient skill and superior construction ability. It was also familiar with international standard. The material, technology and management of the abattoir were all executed according code standard of British. In 2006, Shanghai Research Institution of Building Science carried out tests on the concrete strength and the depth of concrete carbonization. Testing results showed that concrete strength exceeded the strength requirements of original design regulations and the depth of concrete carbonization did not became bigger much in the past years. The text approved that the building is still in good conditions after 70 years.

4.4.2 Site Selection and Technical Inquiry

In 1921, one big fire brought disaster to the old abattoir (at current Haining Road and Jiulong Road), thus Shanghai Municipal Council began to consider construction of new abattoir at new site. In 1924, two plots at the both sides of Shajing Road (original Sawjin Road) was finally confirmed（Figure 4-7）in the present address of Hongkou Lane and Shajing Road. The traffic and accessibility were considered firstly in the selection of site. This new site was near to railway and wharf in order to use the port to transport the dirt such as haslet and dung. The proximity to railway was convenient to

[14] Ah Hong & Co. was established in the year round 1895, which was a famous construction company in Shanghai by the end of 19th Century. Ah Hong &Co. had contracted many projects, and the important projects include Shanghai Sichuan North Road Bridge Post Office Building (now national key cultural relic protection site), British Consulate, Racetrack Stand, etc.

[15] Due to the threat of the warring of war .Since 1931, China and Japan had been embroiled in incessant, smaller conflicts, and the Second Sino-Japanese War happened later.

[16] This statement can be generally divided into two parts: the first part mainly illustrated the issues of the communication relationship between Party A and Party B, totaling 32 articles; the latter part was the technical requirements of various specialty types of work, including material, technology, and construction issues, and pointed out the responsibilities to be borne by Party B, totaling 74 articles. Professor Zhu Xiaoming has an deep study on this statement. See more in HE Wei and Xiaoming, "An 80 Years Old Construction Report- Interpretation on the Archives of Shanghai Municipal Council Abattoir."

transport the haslet and meat products. Because Shajing Road was close to neighboring vegetable market, meat market and butcher residence, it could save traffic time and expenses. The site selection comprehensively considered urban context as well. Shajing Road was in the middle position of international settlement, and also close to Shanghai North Station, Hongkou Market and original abattoir. Thus it can better serve various jurisdictions of foreign settlement. Since the land price in Shanghai was flourishing then, the single plot area of Shajing Road was not enough, the site of new abattoir was composed by two plots cut by the road. This was the result obtained on the basis of comparing the land price, operation expenses, and traffic expenses, etc for multiple times.

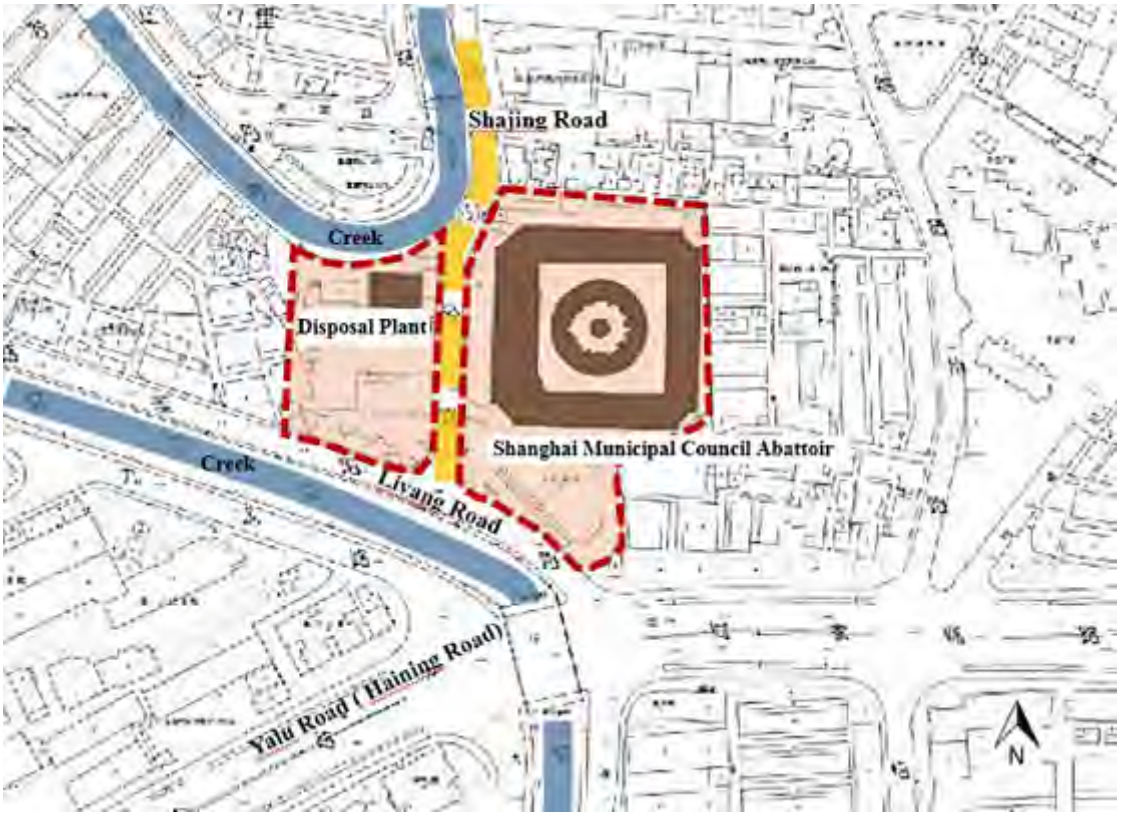

Figure 4-7 Site plan of the original Shanghai Municipal Abattoir (Source: by author)

It is the usual practice that, in the design of abattoir, slaughter building and barn were established at two single-storey building with no interference. Such layout also corresponded to the separation of east and west plot, which was embodied in original design scheme of this abattoir. However, the rapid development of settlement nearby limited the site, so the project had to develop upward into a multi-storey building to achieve more space. The multi-story abattoir in such a scale and number of storey was unprecedented. It was a challenge at that time, although Shanghai at that time already possessed the knowledge to deal with such multi-storey reinforced concrete building.

In 1928, the design draft of abattoir was confirmed, but it did not start immediately. Because there was no reference for such kind of new abattoir. In Mar 1930, Deputy

Director General of Health Office wrote to health director who was in New York at that moment. Due to the lacking of experience in such modern building, he hoped that health director could provide some data from USA. His problem was mainly emphasized on three points: general layout design, number of storey and storey height, as well as the treatment method on livestock. After the Health Director immediately wrote to the relevant departments of various American cities, Los Angeles offered relevant suggestions[17].

Later on, the health director was informed that Toronto in Canada had an excellent abattoir already operated for 16 years, such abattoir was the only one owned and managed by government in North America. In reply, the City of Toronto provided reference for construction operations and equipment arrangement[18]. It suggested Shanghai Municipal Council to place slaughtering procedure at the top storey, and then it can transport livestock to the bottom storey by virtue of gravity, and directly transport raw meat to other market via over-bridge, avoiding crossing with other departments. These opinions were basically adopted in the scheme of Shanghai Municipal Abattoir (Figure 4-8). Based on extensively soliciting international experience, Shanghai Municipal Abattoir Council was began to build.

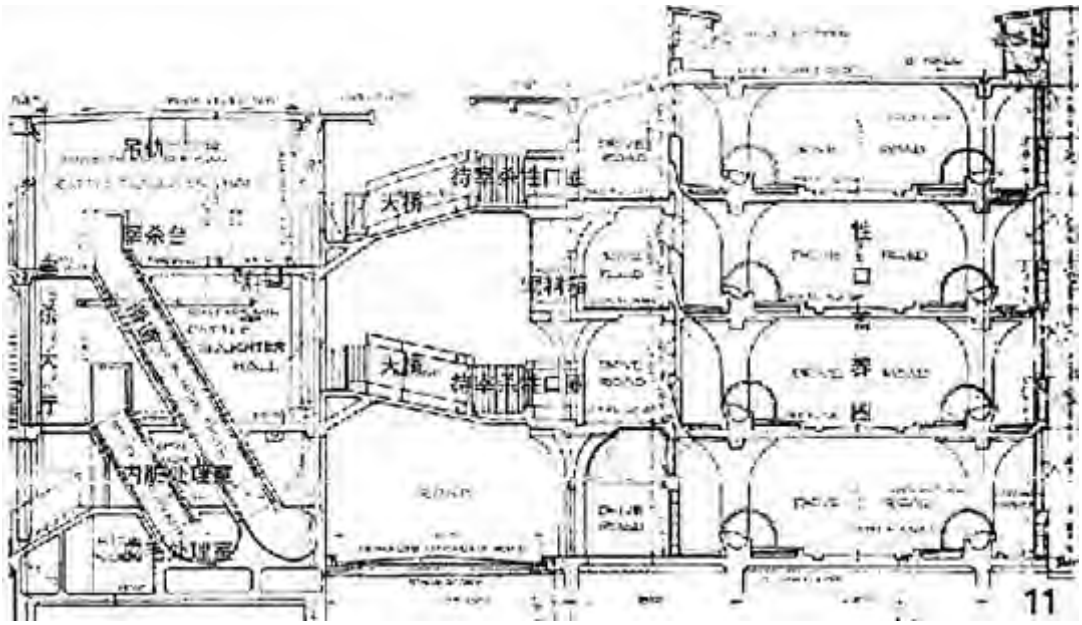

Figure 4-8 original section plan of the Shanghai Municipal Abattoir (Source: according to HE Wei, and ZHU Xiaoming, "A Research on the Architectural Archives of the Shanghai Municipal Council Abattoir," Time Architecture, 2012, 108–113)

[17] Shanghai Municipal Archives, City of Los Angeles's suggestion for the Shanghai municipal abattoir, archive NO.U1-14-2392, 1924-1935. See more in the appendix

[18] HE Wei, and ZHU Xiaoming, "A Research on the Architectural Archives of the Shanghai Municipal Council Abattoir," Time Architecture, 2012, 108–113

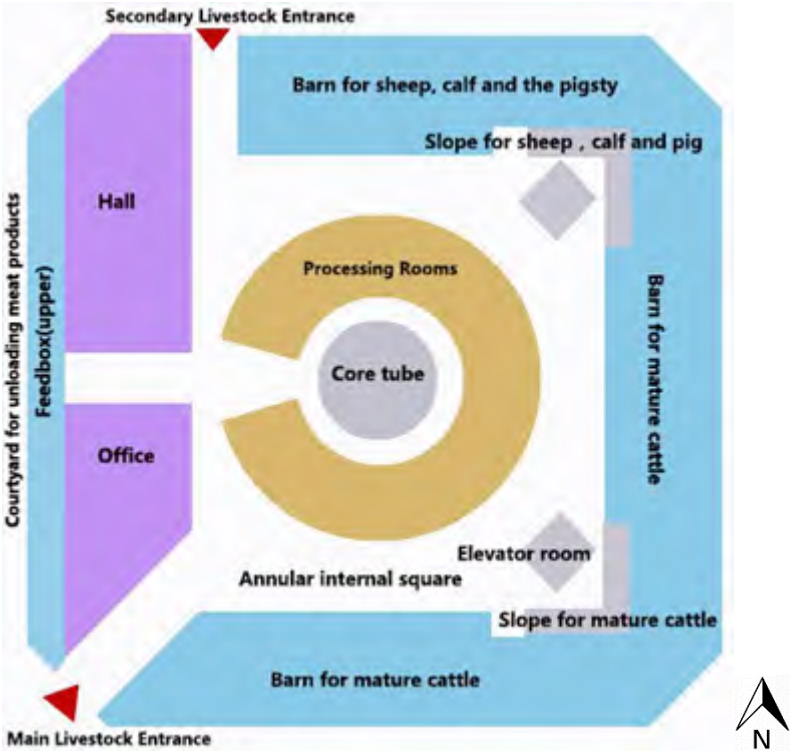

Figure 4-9 functions and circulations diagram of the ground floor (Source: by author. according to HE Wei, and ZHU Xiaoming, "A Research on the Architectural Archives of the Shanghai Municipal Council Abattoir," Time Architecture, 2012, 108–113)

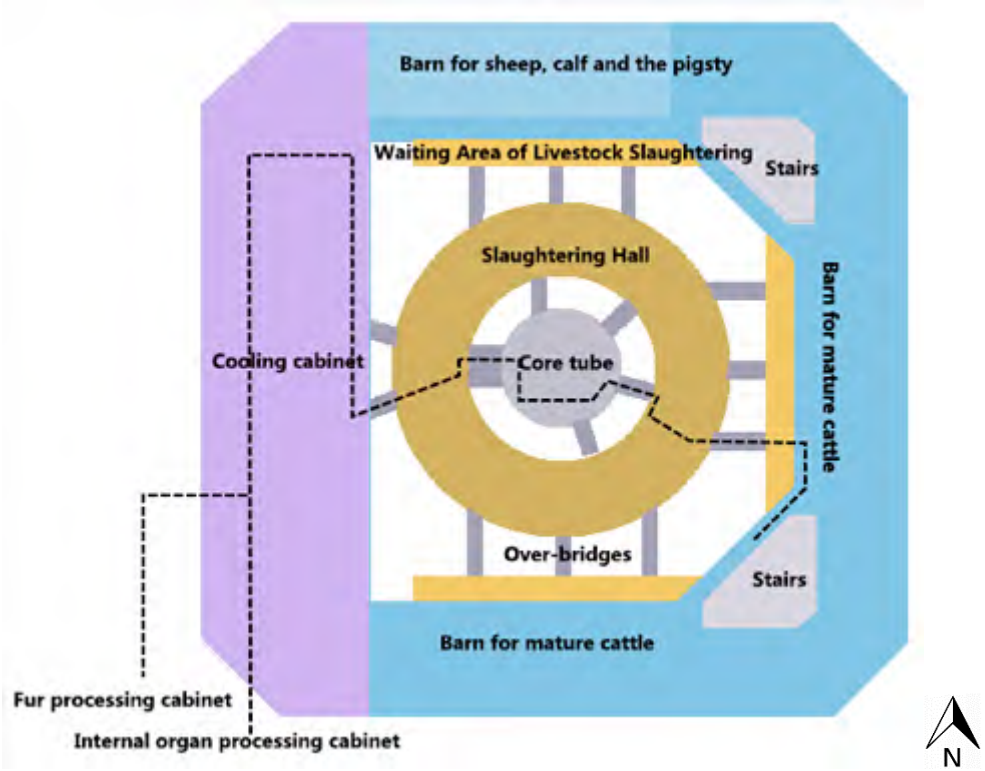

Figure 4-10 functions and circulations diagram of the 2ed and 4th floors (Source: by author. according to HE Wei, and ZHU Xiaoming, "A Research on the Architectural Archives of the Shanghai Municipal Council Abattoir," Time Architecture, 2012, 108–113)

4.4.3 Functions and Circulations

The circulations of abattoir was complex due to its special functions. Its organization system and the operation mode can be present by analyzing the different functional parts. (Figure 4-9; Figure 4-10)

(1) *Livestock Entrances*

The abattoir mainly received livestock transported from Yalu Road (present Haining Road) and North Railway Station, thus the main entrance was set at Shajing Road close to Liyang Road, located at the southwest corner of the building(Figure 4-9). In addition, the west side of north ring of the architecture had one secondary entrance. Livestock enters the annular internal square from such two entrances. The west side part of inner square was separated by a path for linking central slaughter part and the courtyard for unloading meat products in the west side of the building.(Figure 4-9)

(2) *Barns*

When the livestock enters the annular internal square from such two entrances, it can be directly driven into barns at the south, east and north ring of the building according to the set route, or driven into the barn in upper storey via slopes. The internal square had two slopes, of which, the one located at southeast corner was for mature cattle; the one at northeast was for calf and sheep. The slopes were also used as the firefighting access. According to customs, the barn should have one elevator. However, in fact, such elevator shaft at the southeast corner of internal square did not install elevator and was changed into laborer room later.

The barn with various fields for sheep, calf and the pigsty was located at north ring part of barn; the bottom barn of east side at north ring was set with sick cattle breeding shed, so as to directly separate sick cattle for breeding at the time of entrance. The barns of mature cattle were located at east ring and south ring of each storey, and equipped with trough, water fountain and drain; then cattles can be driven to barns at both sides from the cattle road/slope. The west side corridors of internal square on the first and third storey were equipped with feedbox, and the corridor close to the corner of slope was equipped with pot and stove for boiling out feedstuff and discharging flue leading to the roof. (Figure 4-9; Figure 4-10)

(3) *Waiting Area of Livestock Slaughtering, Cage for Slaughter and Slaughtering Hall*

When the livestock was bred for 24-48 hours in barns, it shall be driven to waiting area of livestock slaughtering on the balcony of second and fourth storey. Then the livestock was driven out to pass over-bridges to cage for slaughtering at the outside of slaughtering hall. The width of over-bridge was only for the passing of one draught animal and make it cannot turn, thus it had to walk directly to the cage. Through the different elevation setting between the cage for slaughtering and indoor floor of slaughtering hall, the slaughtering process can experience the subtle change from high to low in elevation, thus subtly utilizing gravity as the power of mechanical operation. (Figure 4-10）

The concrete process is that when livestock enters the completely sheltered cage for slaughtering, the workers board the platform opposite to the head of livestock, and they adopt electric shock way for slaughtering. Later on, the workers descend the cage with

the mechanical system designed utilizing lever principle. After opening the cage, the carcass of livestock would slide to the designated position, while the cage would automatically shut after unloading and return to initial position. The center part was slaughtering hall, the workers would then carry out bloodletting treatment to the carcass of livestock; the blood would be discharged to a specific barrel on floor. After bloodletting, part of skin would be peeled off and the haslet would be removed. Subsequently, the workers would use an electric pulley to hoist carcass, suspending it on lifting hock on the sliding rail of ceiling and moving to center building. Then complete peeling shall be done finally, and the position shall be cleared and used to receive the next carcass of livestock.

(4) *Carcass and Organs Passageway*

The carcass of slaughtered livestock was not allowed to touch the ground. It needed to gather around the core tube via the internal over-bridge of slaughtering hall along the sliding rail of ceiling, and then slide to cooling cabinet for cooling at the west wing. The supervisor shall check and weigh the carcass of livestock. Various kinds of internal organs were discarded to the pipeline leading to bottom processing cabinet, and the nearby of each slaughtering platform had two pipeline mouths. One was fur pipeline that led to fur processing cabinet at the bottom semi-basement; the other was internal organ pipeline that led to internal organ processing cabinet at bottom interlayer.

(5）*Cooling Cabinet*

The cooling cabinets located at second and third storey of west wing of abattoir were divided into several parts to accept various parts of livestock carcass to be cooled. When these meat products slowly moved along the whole mounting track, its cooling process shall be finished. Meanwhile, it also meant that meat products could be sold. Then part of livestock carcass was directly unloaded to the haulage truck via hoisting system, and delivered to various points of consumption within international settlement, while the other part shall be delivered to meat market and refrigerated storage close to the south side of abattoir via the connecting bridge in the south of cooling cabinet[19].

(6) *Processing Room*

The central basement of slaughtering hall had a boiler room, mainly for providing boiled water and vapor for slaughter chamber, internal organ processing chamber, vaporizing chamber, butcher bathing and kitchen. The basement had two furnaces for providing heat for the boiler. One furnace was for incinerating complete sick livestock, the other for incinerating small sick livestock organs. The furnaces were enclosed with a chimney stack between two stairs, and there were three flues. Of which, two were for serving two furnaces, the other one for discharging smoke and heat dissipation for the whole furnace chamber. Later on, after the completion of disposal plant in the west side of Shajing Road, sick cattle processing business had then been transferred to there.

As showed above, the operation of these functions had fully utilized the law of gravity. The Public Works Department once declared that the abattoir was a “self-sufficient” architecture, originating from the action of gravity, objects can automatically descend

[19] This part had been dismantled, it was a hotel before the renovation. see more in HE Wei, and ZHU Xiaoming, “A Research on the Architectural Archives of the Shanghai Municipal Council Abattoir,” Time Architecture, 2012, 108–113

or flow due to different altitude. This appropriate combination of circulation and gravity would greatly save energy consumption. The gravity application in the process of slaughtering learned from the suggestion by the City of Toronto is very helpful.

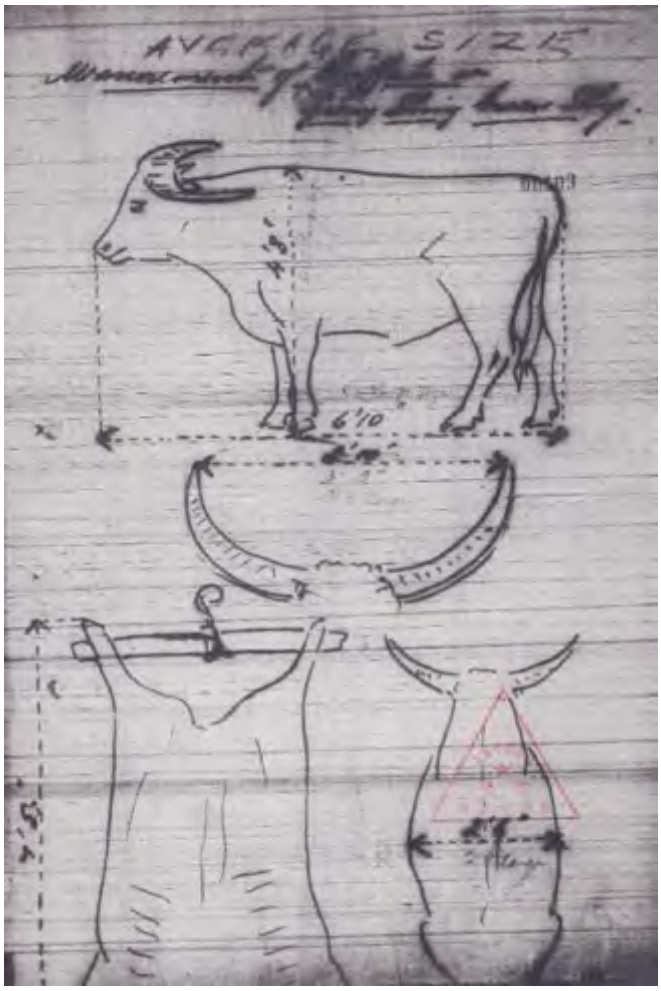

Figure 4-11 The study of the sizes of cow for the abattoir (Source: Shanghai Municipal Archives)

4.4.4 Architectural Form and Spatial Composition

The original section plan shows that the height of four-storey of barn area (outer ring) is equivalent to the height of three-storey slaughtering hall in center (Figure 4-8) , and the difference of storey height is caused by different functions. Because livestock in slaughtering hall is at suspended status, it needs high storey height. If each storey of barn area were set with a slaughtering storey, the numerous over-bridges connections would be unbeneficial to the lighting and ventilation of architecture.

The layout of Shanghai Municipal abbatior was originated from the contradiction between the large space requirements and the small plot. The width of the outer ring corresponds to the width needed by two rows of mature cattle breeding and one row of livestock shed for slaughtering. The layout of barn area (outer ring) and central slaughtering hall can be seen as the relation between expansion external space and the

converging core. The gap between them are assigned to an inner annular square for the permeation of sunshine and ventilation, which was the ingenuity of the architect in guaranteeing space quality.

The central slaughtering hall corresponds to the size needed by slaughtering, and its zigzag design tailored the residual space. When livestock is shocked down at circular slaughtering area for bloodletting, it need bigger space; later on, livestock shall be suspended for slaughtering, the space shall be small; finally when finishing slaughtering and transfer to the center, it only need smaller space. Thus circular plan is most space-saving. Moreover, the procedures including internal organ processing, carcass transfer after slaughtering all need to be processed centrally. Circular plan is beneficial for the concentration of procedures, thus such design is undoubtedly reasonable and convenient as the distance to center of circle is the same.

The plane size of circular slaughtering hall and the number of over-bridges (used as stairs) was also calculated. Shanghai Municipal Council once considered decreasing the quantity of over-bridges to save cost. The architect refuted, believing that the livestock carcass after slaughtering can save more time from various over-bridge to central core than concentrating at certain point and then to the central core from one or two over-bridge. The former minimizes the corridor width needed in inner ring, letting the space of atrium within slaughtering hall be larger. Because it is important to increase lighting and ventilation space as far as possible in such bloody site. In addition, the workers can reach the central core from various over-bridges and then to bottom, it can avoid the interference of various slaughtering areas.

When visiting this building, the intricate layout of over-bridges often makes people puzzled. In fact, it also embodied that main function within abattoir decides architectural form. It can be seen from plane that livestock barn area, slaughtering hall and cooling area are at three entity parts, and the space has complete and overall characteristics, there is no insertion of staircase causing blockage. All over-bridges are at peripheral subordinate position, resulting in the pureness of inside space of the central core and the complexity of outside space of the core. In fact, there are only two levels after entering the inner square, one is external smooth interface of entity space of the core; the other is traffic connection part floating at such interface background. On the one hand, such layout guaranteed the practicality of main space, and reduced the volume of construction entity; on the other hand, the inner square space become large and its spatial quality is improved.

In the general design of architecture, when people enter multi-storey space, its traffic way is generally from staircase and then corridor, from vertical and then horizontal. However, reverse strategy was adopted in the Shanghai Municipal Council Abattoir. The adoption of such strategy was mainly out of the following reasons:

(1) The abattoir was managed by Shanghai Municipal Council, various meatman would rent slaughtering room, and the architecture was used by different owners at the same time. Thus it should guarantee that the different circulation have no cross, and self properties are within self jurisdiction scope.

(2) The abattoir has strict health management system, all kinds of people can only contact their own parts.Thus it should guarantee there’s no cross contamination.

(3) The site of abattoir was small, the smaller the area of traffic part, the bigger emotional square space for lighting and ventilation would be.

Such three points decided the layout of large amounts of over-bridges from bottom to various upper function areas within the architecture. Interestingly, when people enter this building， they would visually obtain the conclusion that traffic dominates the space of abattoir, but in fact, traffic only played a supporting part.

4.4.5 Structural Characteristics

The umbrella-type pillars and non-beam slab are the main elements characterize the structure of abattoir. Among theumbrella-type pillars, the interior of west part of building and the corridors of east, south and north part of building used octagon umbrella-type pillars, while the interior of east, south and north part of building used quadrangle umbrella-type pillars（Figure 4-35）.

With the non-beam slab, the function of abattoir is well matched to its structure. Non-beam slab has many characteristics: the first one is the smooth slab bottom. The ceiling can be directly painted without suspended ceiling, and the installation of air conduit can pass smoothly. The second is the low height of the structure. It can significantly decrease storey height. Compared with beam-and-slab floor, in the same ceiling height apartment block, it can at least increase one storey every 10-storey while not changing the total height of building. Thus it has significant economic benefit. The third one is simple in making up a form and reinforcement, thus it can shorten project time. The abattoir is a filthy place but has high sanitation requirements, thus convenient for cleaning is very important. The ceiling of non-beam slab structure is convenient for cleaning as it does not need suspended ceiling. The smooth ceiling of non-beam slab also can randomly install hook for mechanical operation. Furthermore, the ventilation and lighting are very important in abattoir. Because it has strong smell, and different smells are not suitable for cross communication. If the bloody smell of slaughtering building is transmitted to breeding building, it would cause the panic of livestock.The space height with non-beam slab structure is high, which is beneficial for ventilation and lighting.

The Realization of Shanghai Municipal Council Abattoir

1893： Shanghai Municipal Council Public Works Department built the Hongkou Abattoir at No.10. Shajing Road

1919： British concession Public Works Department expanded the Hongkou Abattoir

1931： Shanghai Municipal Council Public Works Department began to construct the Shanghai Municipal Council Abattoir at No.10. Shajing Road

1933.11： The completion of Shanghai Municipal Council Abattoir at No.10. Shajing Road

1934.01： Shanghai Municipal Council Abattoir at No.10. Shajing Road was put into use

1935： The completion of another building of Shanghai Municipal Council Abattoir at No.29. Shajing Road

1937： With the anti-Japanese War broke out, Japanese army took charge of the Shanghai Municipal Council Abattoir

1941： Japanese puppet government took charge of the Shanghai Municipal Council Abattoir

1945.08： With the winning of anti-Japanese War, Shanghai Municipal Council Abattoir was took charge by Shanghai government of Republic of China

1946：Shanghai Municipal Council Abattoir developed and became the largest abattoir in the Far East. It provided two thirds of the fresh meat in Shanghai

The transformation and abandon of Shanghai Municipal Council Abattoir

1949.05：Shanghai Military Control Commissions of People's Liberation Army took charge of the Shanghai Municipal Council Abattoir

1949.06：The Health Office of Shanghai Military Control Commissions took charge of the Shanghai Municipal Council Abattoir

1953： Beside the slaughter, Shanghai Municipal Abattoir began to pick organs to export

1958.09：It became the Shanghai Frozen Meat Plant

1969：It became the place where Shanghai Meat Plant, Shanghai Chang-shen Food Company, Shanghai Food Research Institute and Shanghai Food Machinery Plant gathered

1970： It became Shanghai Great Wall Biochemical Pharmaceutical Factory。

2002： Shut down.

2002-2005：Abandoned

The reborn as 1933 old millfun

2005.10： It was listed in the fourth batch of Excellent Historical Buildings in Shanghai

2005.12：Shanghai Creative Industry Center began to carry out an investigation on it.

2006.06：Shanghai Creative Industry Investment Co. Ltd., which was collectively established by the three shareholders of Shanghai Creative Industry Center, Shanghai Automotive Asset Management Co. Ltd., and John Hawkins (consultant of the center), started preliminary work on the reconstruction.

2006.08： Shanghai Creative Industry Investment Co. Ltd. started the reconstruction officially.

2006.08： Consultation on the design and planning

2006.08： Shanghai Creative Industry Investment Co. Ltd. renamed Shanghai Municipal Abattoir to 1933 old millfun.

2006.09： Shanghai Cultural Relics Administration Committee started the feasibility study on the building as heritage

2006.10： China IPPR international Engineering Corporation(Shanghai) was confirmed as the design unit

2007.01： Shanghai 1933 old millfun Creative Industry Management Ltd was established for the management of programs

2007.05： Shanghai Creative Industry Investment Co. Ltd. signed co-operation agreements with Shanghai Zhongheng Enterprise Management Consulting Co., Ltd for the operations management

2008：The completion of the reconstruction

2008- Now: 1933 old millfun Creative Industry Park

Figure 4-12 The significant events of Shanghai 1933 old millfun (Source: by author)

4.5 Case Study Analysis: Reuse Methodology Research

Project	1933 Old Millfun
Architects	ZHAO Chongxin, CHEN Haipen, ZHU Zhongyuan China IPPR international Engineering Corporation(Shanghai)
Developer	Shanghai Creative Industry Investment Co. Ltd
Location	NO.10 and 29,Shajing Road, Shanghai,
Site area	12,600 square meters
Total floor area	32,000 square meters
Design /completion	2006-2008

As we can see from the significant events of this abattoir, the building had been used as abattoir until 1960s, with the construction of some annexation buildings. Then it was utilized as a medicine plant from 1970--2002. Later, it was abandoned and the whole buildings became the asset of Shanghai Automotive Industry Corporation. In 2006, one private enterprise entitled "Shanghai Creative Industry Investment Co. Ltd." was collectively established by the three shareholders of Shanghai Creative Industry Center, Shanghai Automotive Asset Management Co. Ltd., and John Hawkins - consultant of the center.[20] Then the abattoir was started to renovate in aim of creating a creative center with new functions include luxury center, experience center, history museum, film and TV shooting base, creative industry promotion center, and the related leisure facility, such as bar, coffee house and tea house. The business type with frequent logistics and more sewage such as large scale catering are not introduced, so as to reduce the pressure to the original architecture.

4.5.1 The Status Quo before the Reuse

Before the reuse project, there are five buildings in 1933 Old Millfun (Figure 4-13):

1# building was original municipal abattoir, totaling five-storey in reinforced concrete structure.

[20] Jun Wang, "Shaping Distinctiveness in Culture-Led Urban Regeneration:public-Private Partnership in the Project of Red town,Shanghai," *Cities*, 26 (2009), 318–330 <doi:10.1016/j.cities.2009.08.002>.

2# building, the original disposal plant, totaling four-storey, was completed with reinforced concrete structure in 1933. It was used as disposing site and furnace of wastes such as sick livestock, waste meat, haslet, and fur;

3# building ,the dog shed of abattoir completed in 1933-1934;

4# building, the canteen and warehouse completed in 1966

5# building, the boiler room completed at the beginning 1950s

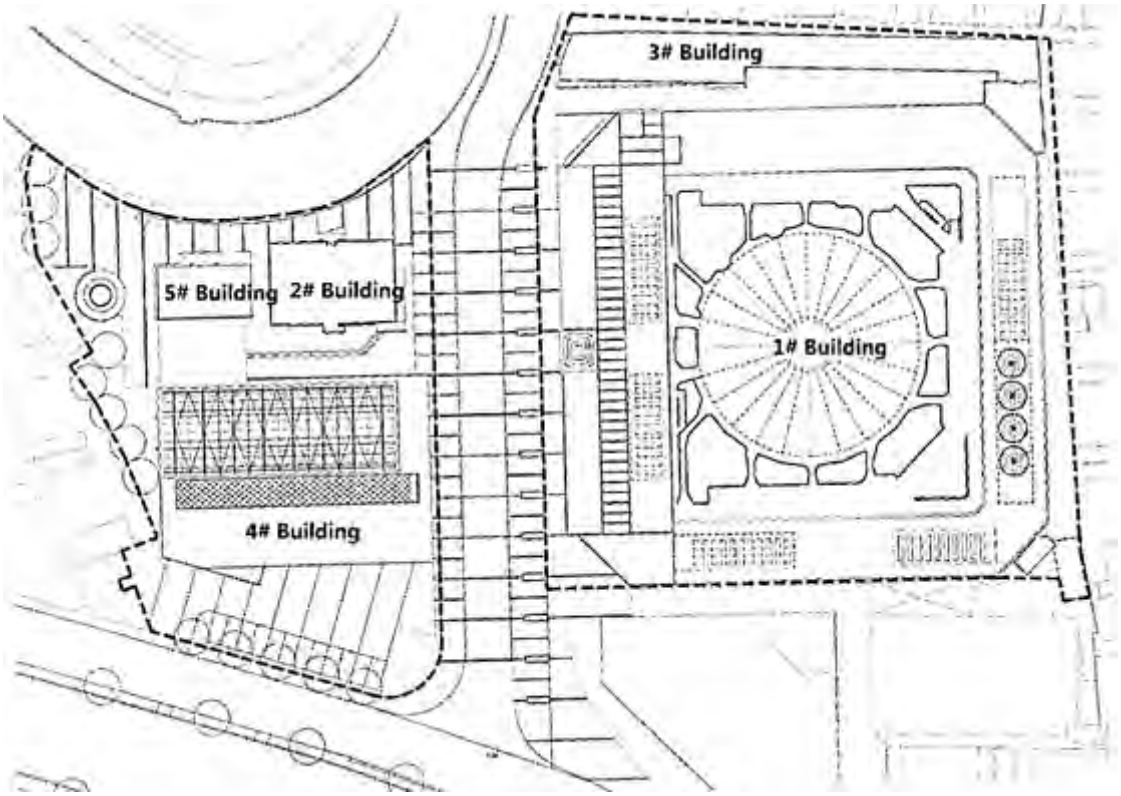

Figure 4-13 The general plan of the five buildings: 1# building -Shanghai Municipal Council Abattoir; 2# building-the original disposal plant; 3# building-the dog shed of abattoir; 4# building-the canteen and warehouse; 5# building-the boiler room (Source: by author. According to Chongxin, ZHAO, "1933 Old Mill," Architectural Journal, 2008, 70–75)

Among them, the original Shanghai Municipal Abattoir (1# building) is the most valuable building in the site. Due to its architectural value and historical value, it was listed in the fourth batch of Excellent Historical Buildings in Shanghai and historical site monument of Hongkou District, Shanghai in 200521. Before reconstruction, this building was already beyond all recognition (Figure 4-14). It was used as warehouse and auxiliary house of lots of units, its outer wall was painted with pink coating(Figure

[21] NIE Bo, "On Preservation and Rehabilitation Of Modern Concrete Industrial Buildings in Shanghai(1880-1940)-Case Study on Rehabilitation of the Abattoirof S.M.C.P.W.D (1933 Old Millfun)" (Tongji university, 2008), p. 300

4-29;), and inner wall has different face brick, mosaic, coating; indoor space was also cut into labyrinth, and lots of bridges were damaged(Figure 4-15; Figure 4-16).

Figure 4-14 1933 Old Millfun before the restoration, 2006(Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html)

Figure 4-15 The interior of 1# building before the restoration,2006 (Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html)

Figure 4-16 The interior of 1# building before the restoration, 2006 (Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html)

4.5.2 Reuse Strategies and Principles

The value assessment is necessary before the reuse. Basing on its peculiar heritage value, 1# building, as the representative heritage of early industrialization stage in 1930s, is the main renovation and reconstruction object in the reuse. It is the only abattoir architecture in its category in the world up to now, which has rarity and uniqueness. Its umbrella-type pillars and non-beam slab have advanced construction technology. The bridges are unique in space, and the facade modeling typical Art Deco style with high cultural value. The space of the abattoir is also particular. It is square outside and round inside, the four parts around enclose one square, the middle was a 24 side main building, which connect with the outside with 13 over-bridges on each storey (totaling 26 over-bridges in two storey);

In reuse strategy, on one hand, it should be progressed as per the laws, regulations of *Excellent Historical Building* and the approval opinion of the Shanghai Municipality. On the other hand, the architect ,ZHAO Chongxin, views the whole architecture as a reinforced concrete machine designed as per slaughtering technology. He said “I believe the architect did not want to create it into an extraordinary architecture at that

time, but it is."[22] The operation method of abattoir and original characteristics of space have been seen as key aspects for representation in reuse. He believes that, as part of technological process, the slopes and bridges connecting the interior and exterior space are the key elements. They have organically liked different storey, which is not only significant to the temperament of the original architecture space, but also essential to constructing the new function of creative industry and facilitating it to be an attractive place.

The main restoration principles include:

1. Authenticity: The historical appearance of the architecture should be restored as far as possible, and space design should maintain the temperament of original architectural space. In addition, the typical elements such as the exterior facade, slope, non-beam column cap, concrete ornamental design, and cast iron opening lattice should be conserved and renovated in priority. As to the parts already damaged, it should be restored as per original pattern; the original material and original technology could be used for its original appearance.

2. Identifiability: As newly added element for function requirements, such as elevator and stairs, it should be differentiated with historical element as far as possible, so as to protect explicit historical memory and all keep the separation between old and new.

3. Reversibility: this principle should be applied to new added functional space partitioning and the equipment for meeting functional requirements.

4. Security: Combining with structural steel detection, the components that influence structural security should be reinforced under the premise of not influencing architectural appearance combining with renovation design..

In the reuse, the architect insists that the complete exterior facade of architecture and peculiarity of interior main space should be kept, and new function should be endowed on such basis, hoping to reinvigorate an obsolete industrial heritage, and adjust it into a fashion site from original abattoir architecture. Consequently, the architect conscientiously remove the parts added later on and unified internal material with cement. Furthermore, the plane layout and spatial organization are also re-designed for the requirements of new function. He added staircase and elevator to meet the new requirements on function and security. After reconstruction, the new 1933 old millfun is popular with its special space character. The indoor space is concise in appearance and shape, and geometry in interior decoration; and the internal space composed by umbrella-type column cap has strong visual impact.

Meanwhile, some obstacle parts in the site was demolished (Figure 4-17). Other buildings are also done certain extent of reconstruction. 4# building is a general building completed in 1966, which has structural value. By dismantling part of building that is difficult to be used, a 5m wide staircase is newly built, linking first storey, second storey and garret, so as to generate unique architectural space, and strive to form a dialogue between 1# building and 4# building in term of space relationship.

[22] ZHAO Chongxin, "Change, Platform and Regeneration-Reconstruction Process of 1933 Old Building in Diagramic Representation," Industrial Construction, 38 (2008), 04–19

Architectural appearance also adopts ferrous metal that has same color with the doors and windows of 1# building, forming contrasting and linking sense with the old architecture via modern design method.(Figure 4-28;Figure 4-28;Figure 4-26)

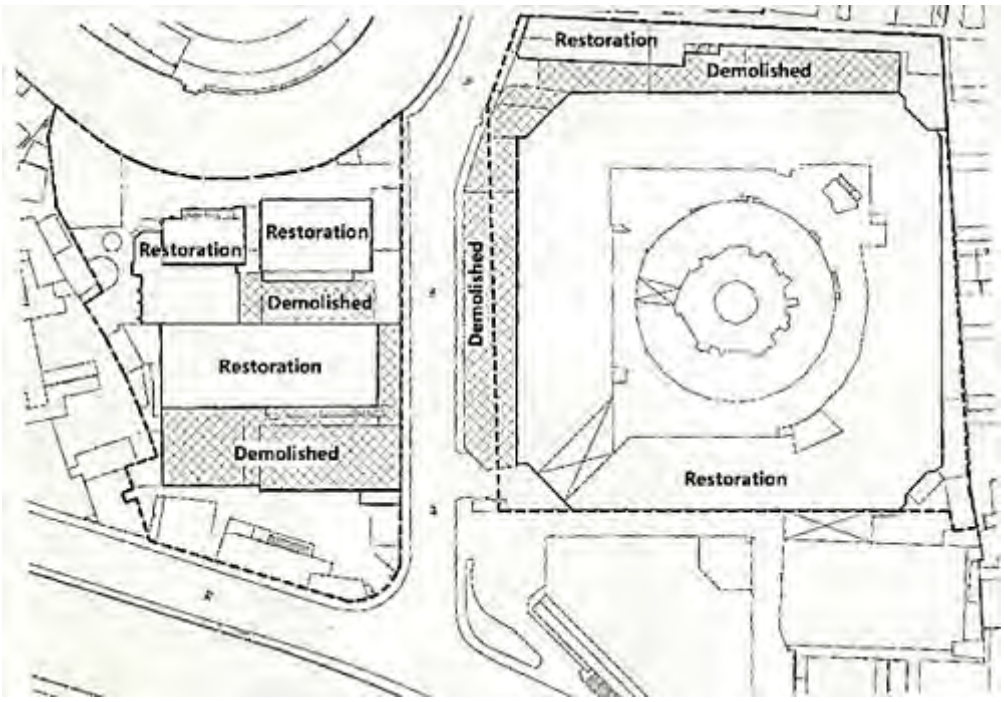

Figure 4-17 The restoration parts and demolished parts in the reuse project (Source: by auther. According to Chongxin, ZHAO, "1933 Old Mill," Architectural Journal, 2008, 70–75)

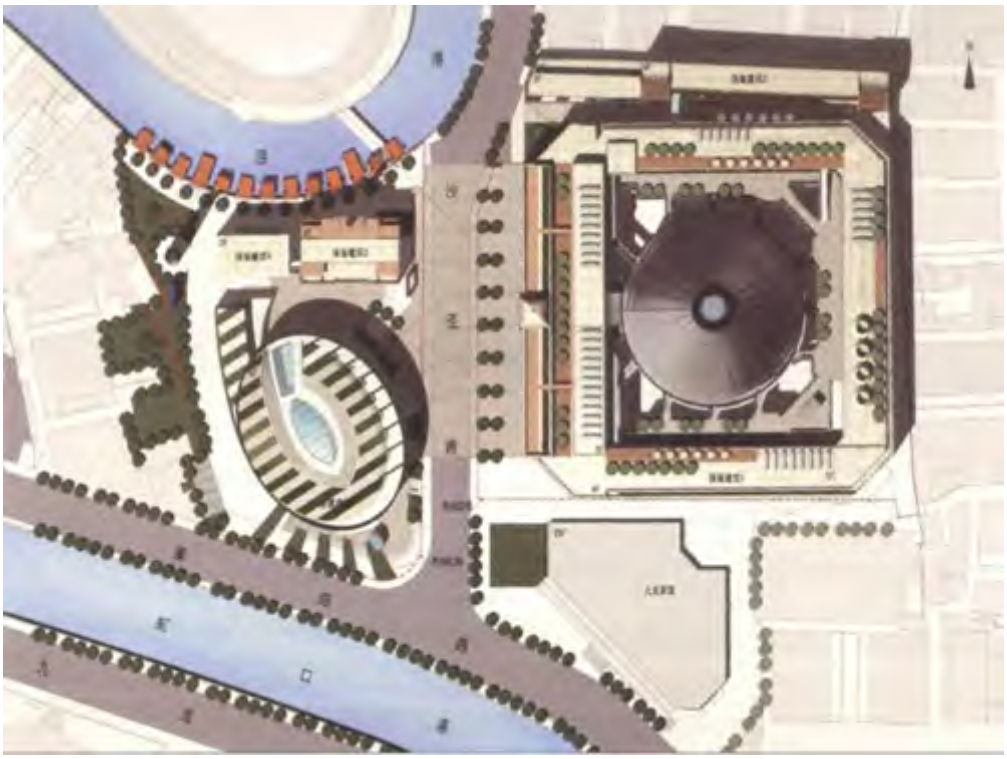

Figure 4-18 The general plan for the reuse project (Source: Chongxin ZHAO, "Reconstructing of 1933 Old Mill," Architectural Creation, 2008, 50–56)

Figure 4-19 Rendering of 1933 Old Millfun overview (Source: Chongxin ZHAO, "Reconstructing of 1933 Old Mill," Architectural Creation, 2008, 50–56)

Figure 4-20 Rendering of the restoration bridge space, 1# building, 1933 Old Millfun (Source: Chongxin ZHAO, "Reconstructing of 1933 Old Mill," Architectural Creation, 2008, 50–56)

Figure 4-21 Rendering of the restoration west fa ade, 1# building, 1933 Old Millfun (Source: Chongxin ZHAO, “Reconstructing of 1933 Old Mill,” Architectural Creation, 2008, 50–56)

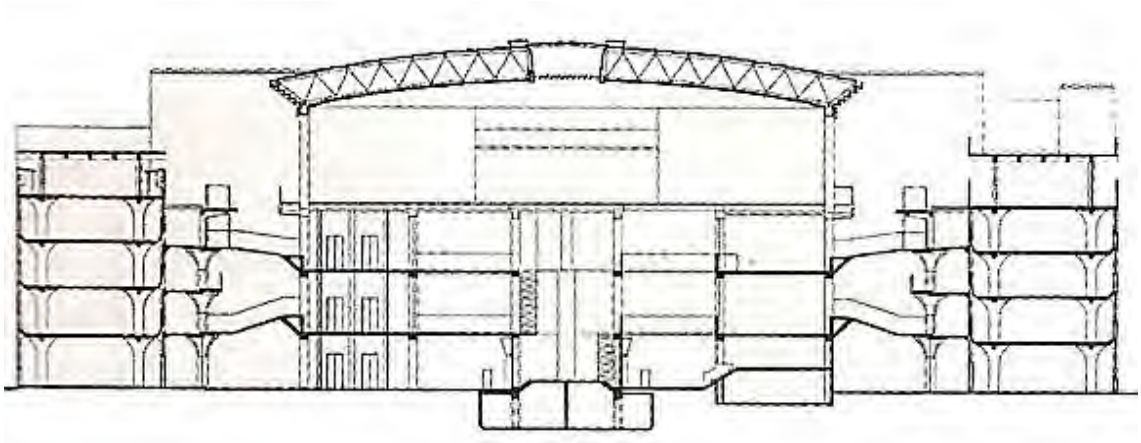

Figure 4-22 Section Plan for the reuse project, 1# Building (Source: Chongxin, ZHAO, “1933 Old Mill,” Architectural Journal, 2008, 70–75)

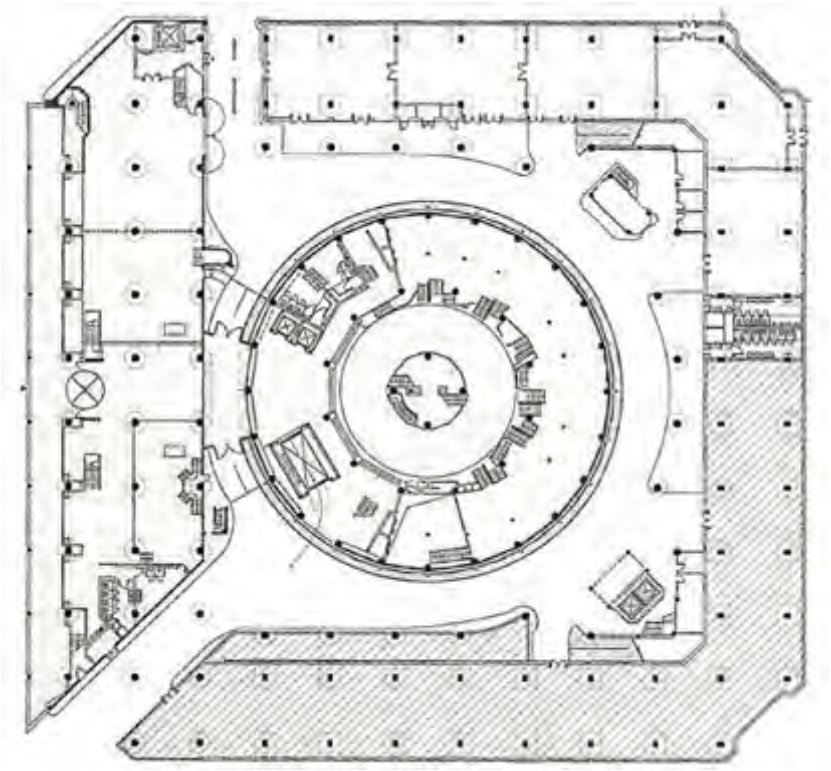

Figure 4-23 The 1st Plan for the reuse project, 1# Building (Source: Chongxin, ZHAO, “1933 Old Mill,” Architectural Journal, 2008, 70–75)

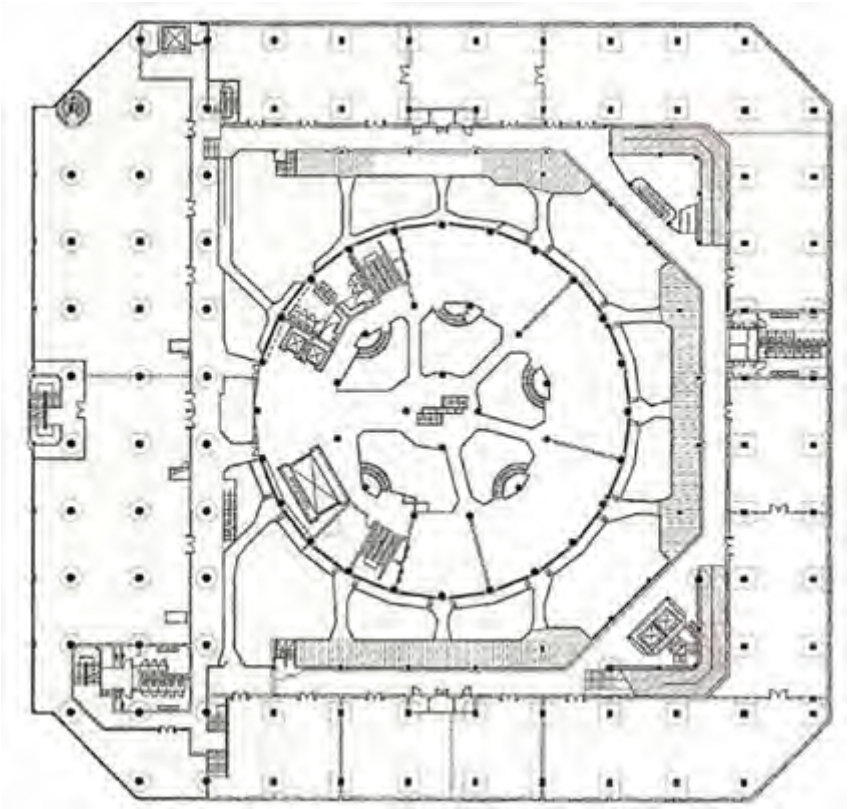

Figure 4-24 The 3rd Plan for the reuse project, 1# Building (Source: Chongxin, ZHAO, “1933 Old Mill,” Architectural Journal, 2008, 70–75)

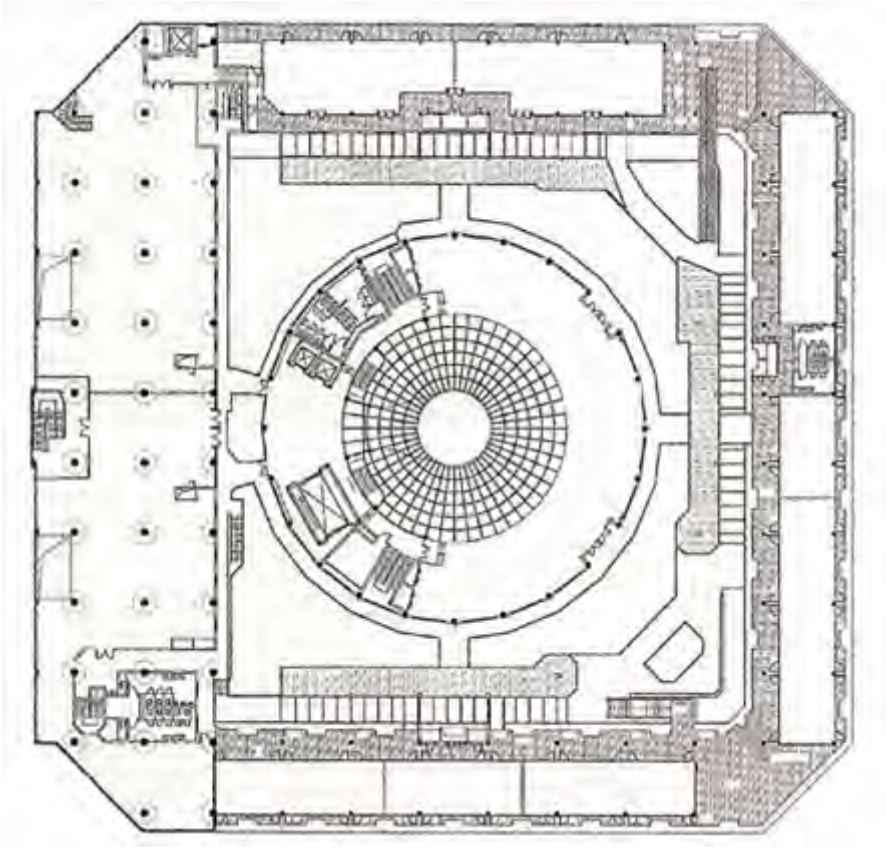

Figure 4-25 The 5th Plan for the reuse project, 1# Building (Source: Chongxin, ZHAO, "1933 Old Mill," Architectural Journal, 2008, 70–75)

Figure 4-26 The 4# building after restoration, 1933 Old Millfun (Source: Chongxin ZHAO, "Reconstructing of 1933 Old Mill," Architectural Creation, 2008, 50–56)

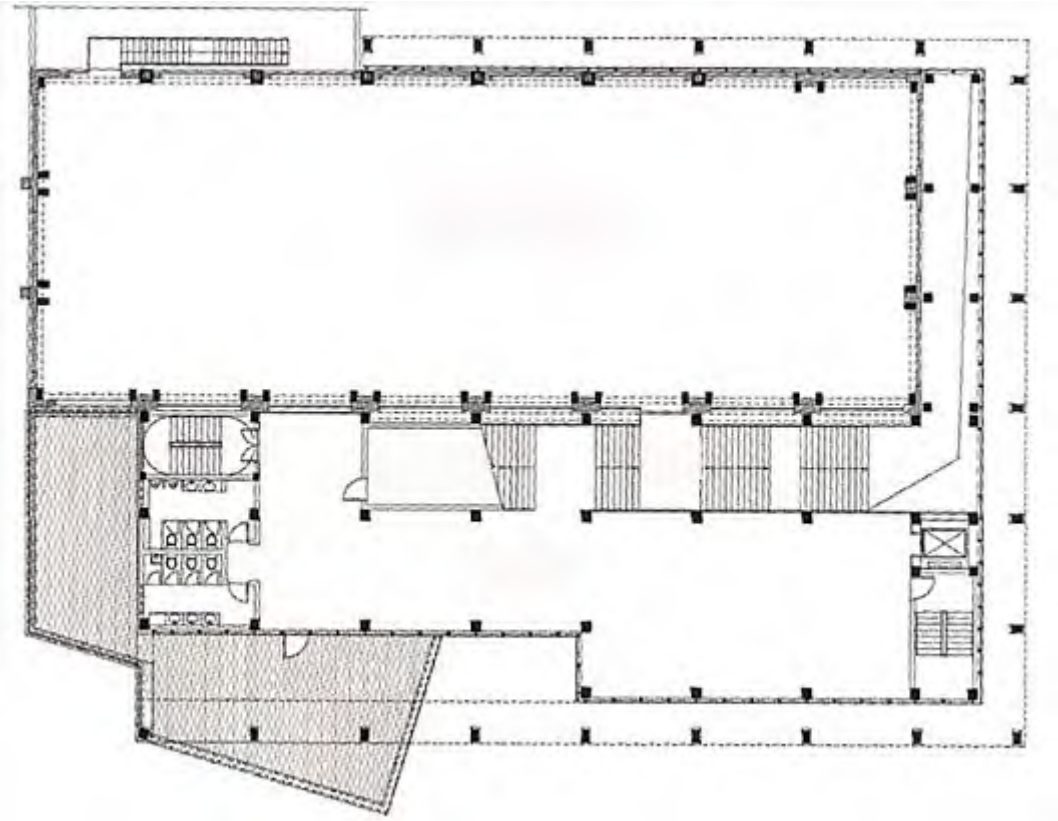

Figure 4-27 The 2nd floor of 4# building (Source: Chongxin ZHAO, "Reconstructing of 1933 Old Mill," Architectural Creation, 2008, 50–56)

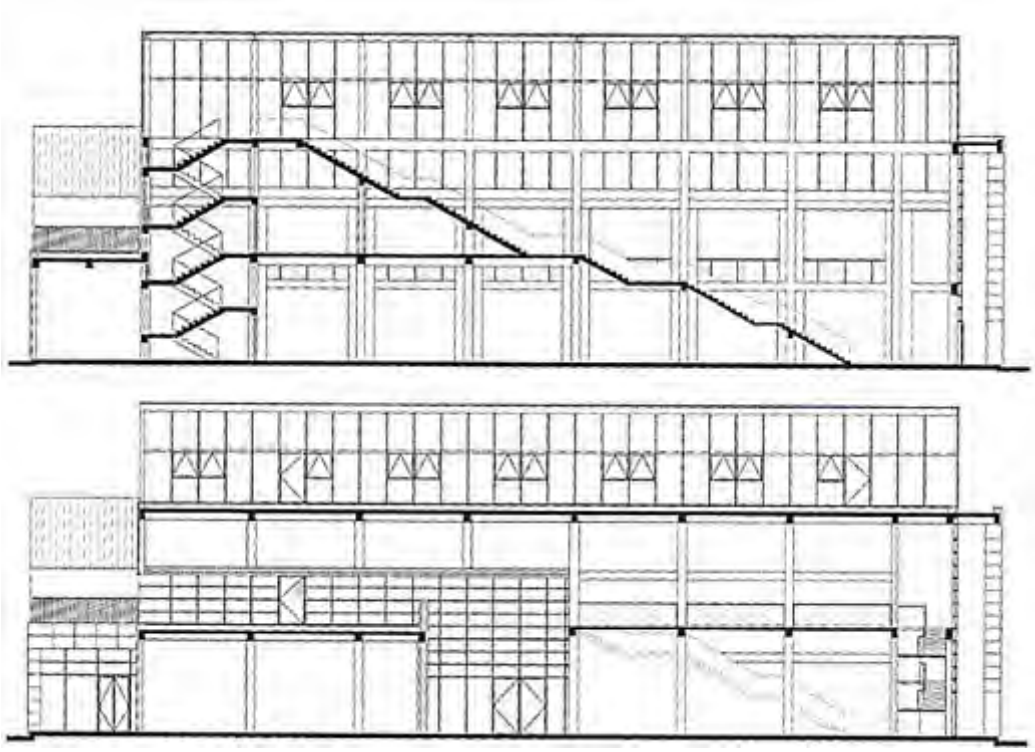

Figure 4-28 The sections of 4# building (Source: Chongxin ZHAO, "Reconstructing of 1933 Old Mill," Architectural Creation, 2008, 50–56)

4.5.3 Renovation Work

By conducting detailed on-site survey, and the research and comparison on historical drawing and photos, the concrete renovation methods on 1# building were formed. As an abattoir, the 1#building was successively used as meat processing plant, pharmaceutical factory, various warehouses, and logistics houses, etc, and experienced a dozen times of preliminary construction, thus space is chaotic, and its inside was separated into mutually impassable enclosure space, and building surface also experienced reconstruction and refurbishment over the years. Therefore, the primary work is dismantling. The material after dismantling shall be over 5000 tons. The whole process in dismantling of no value added wall and added components of building is cautious in very slow way.

The other renovation work, such as dismantling, peeling off, clearing and restoration were carried out to key renovation parts such as architecture facade, slope, bridge, internal basic spatial pattern, non-beam column cap, and other original characteristic decorations, so as to completely exhibit the original historical style and features of the architecture.

The main renovation work includes:

Main façade. It is cleaned and renovated according to the design drawing in 1933. Before the renovation, the external wall was coated a layer of pink coating, thus a neutral detergent was adopted in renovation. The new material for repairing is consistent with original material as far as possible, so as to fully exhibit the color and texture of original “washing stone” concrete used in facade. Meanwhile, the added pipelines on current facade are removed. The blocked lattice windows on the facade are also cleaned, and their seriously damaged parts were restored as original style. (Figure 4-29; Figure 4-30； Figure 4-31; Figure 4-32)

Figure 4-29 The external wall coated a layer of pink, 1# Building, before the restoration (Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html)

Figure 4-30 The construction site of the restoration project, 2006 (Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html)

Figure 4-31 The construction site of the restoration project, 2007 (Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html)

Figure 4-32 The construction site of the restoration project, 2007 (Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html)

Windows. The original goods entry and exit platform below the arcade at the side of west facade was renovated as showcase. In renovation, dismountable active window is re-designed. The Showcase is 500mm away from umbrella-type pillar, so as to offer better conservation in term of visual effect and structure. (Figure 4-33). The other windows are replaced into customized al-alloy window with the delicate decorative lines used for separating.

Figure 4-33 Ornamental designed pillars and showcase below the arcade at the side of west facade, 1933 Old Millfun after restoration (Photo: by author)

Ornamental pillars. In West fa çade there are 10 ornamental designed pillars, and there are geometry lines at the top of pillar with strong decorative style and characteristics. They are strictly restored according to the original drawing.(Figure 4-34;Figure 4-33)

Figure 4-34 The west fa çade, 1933 Old Millfun after restoration (Photo:by author)

Umbrella-type columns. The umbrella-type columns (octagon and quadrangle) are the main characteristic of such architecture, and its shape is originated from the structural design of non-beam slab. In the west part of the architecture, there are octagon umbrella-type columns, and in the south, east and north parts of building there are all quadrangle umbrella-type column. The various polluted decorative surfaces on the column are completely cleaned in the process of renovation. Meanwhile, the cement sand plaster is added with original technology. As one of important elements in the space, the peculiar style of such columns are kept and fully embodied. (Figure 4-35)

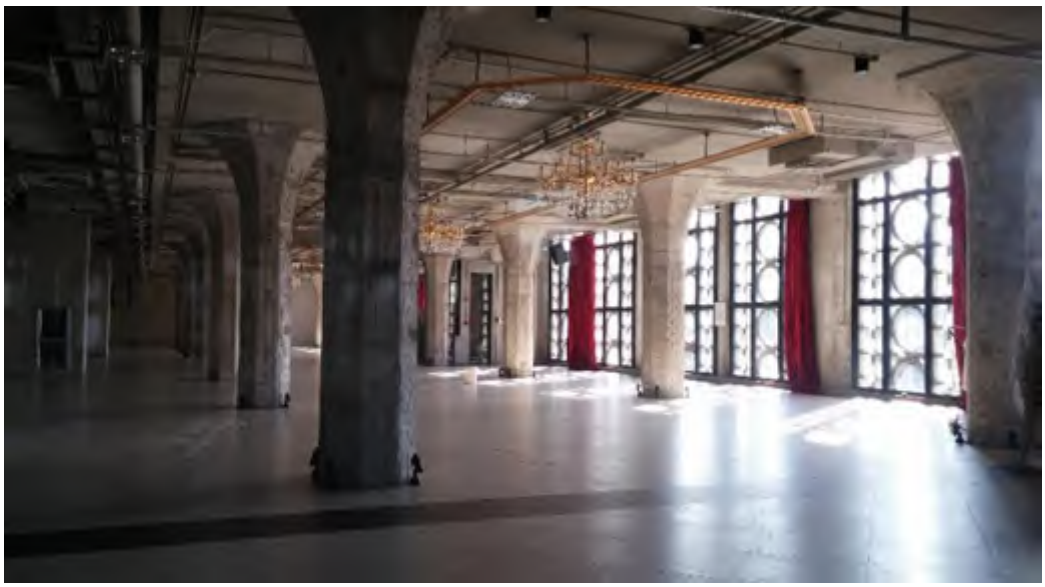

Figure 4-35 Non-beam slab and umbrella-type pillars, the interior after the restoration (Photo: by author)

Bridges. The bridge space is one of the characteristics of the architecture with most peculiarity, and its unique charm was originated from the mysterious and changing space formed by architectural lighting. External bridge space contains four-storey bridges and twenty-six mutually connected skew bridges, and the two new bridges were added later on. Excepted two damaged, these bridges are mostly kept intact. They are renovated in the process of reuse. The two newer bridges added in later period are dismantled to completely restore the original appearance. Meanwhile, there are ten well-preserved interior bridges and five semicircular spiral stairs, the polishing and repairing is mainly carried out to completely restore their original design effect. (Figure 4-36; Figure 4-37)

Figure 4-36 The bridges before restoration (Left) (Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html) and after the restoration(right) (Photo: by author)

Figure 4-37 The cross- bridges after restoration, 1# building, 1933 Old Millfun (Photo: by author)

Slopes. In the original design, there were large amounts of slopes in the building, which make the appearance of the building a bit strange. There are two types. One type are large slopes that facilitated livestock to enter the upper floor barn; the other type are the small slopes that brought livestock to the cage of slaughtering at the highest point of slaughtering process. In the restoration, all these slopes are preserved to represent the original slaughter process. (Figure 4-38)

Figure 4-38 The slope path of cattle after the restoration (Photo: by author)

Circular glass floor center hall. It is the most prominent part in overall reconstruction, a 24-side plane extending the contour of original architecture and 10m high space is at the core position of the architecture. Seen from composition, the new reconstruction part strengthens the central sense of original architecture, and exerts leading role on overall architecture. The floor is enclosed by large sheet glass, the conciseness and pureness of glass form strong contrast with concrete texture of original architecture. Before, the top of this five-storey was a simple steel structure, after reconstruction, the top is set with 6m diameter openable lighting hole. Except providing natural lighting for the hall, it can let sunshine be projected to bridge space, enabling light as great sculptor to carve the bridge space in this historical architecture. The users can watch the bridge space via transparent glass floor. Although the glass center hall is new, but the reconstruction does not destroy the facade effect on Shajing Road, which is in conformity with regulations for *Shanghai Excellent Historical Building*. (Figure 4-39;Figure 4-40; Figure 4-41)

Figure 4-39 Overviews of 1933 Old Millfun, before restoration (Left) and after the restoration (right)(Source: Chongxin, ZHAO, "1933 Old Mill," Architectural Journal, 2008, 70–75)

Figure 4-40 The Circular glass floor center hall after restoration, 1# building, 1933 Old Millfun (Photo: by author)

Figure 4-41 The Circular glass floor center hall after restoration, 1# building, 1933 Old Millfun (Photo: by author)

Elevators. The original building has one goods elevator, and three goods elevators were added in later period, totaling 4 goods elevators. In reconstruction, two goods elevators are dismantled and the other two kept as passenger elevator. Meanwhile, three elevators are added in central core. The lift shaft adopts flameproof glass as partition, forming strong texture comparison with original concrete.

Figure 4-42 The central circular ring before restoration (Left) (Source: http://forum.xitek.com/forum-viewthread-action-printable-tid-390839.html) and after the restoration(right) (Photo: by author)

Stairs. Most of original stairs in the architecture were kept intact; the original stairs in main entrance were dismantled and blocked before, they are re-built in the process of reconstruction. Meanwhile, five new stairs and three new bridges are added for the need of firefighting evacuation.

Bathrooms. As the building was an industrial building, the area of restroom was very small and gradually abandoned due to the change of use function, only a small simple restroom below the stairs of first storey. In reconstruction, each storey of west building, east building and inner circle part is set with restroom; and it is blocked up 400mm basing on existing floor, so as to guarantee the minimum influence to architectural structure.

Interior walls. The newly constructed interior walls in later period are dismantled, and light-weight partition are adopted to divide space for the new functions.

Layout of pipeline. Basing on the principle of renovation on historical architecture, the layout of pipeline is resolved by setting tube well in concentration in different zones; and holes are opened corresponding to pipeline position, so as to maximally decrease the influence to structure and internal space. The layout of all transverse pipelines follows the principle of "concentration, symmetry, and uniformity". In order to decrease the visual influence to the umbrella-type columns, the horizontal distance between all pipelines and fringe of column cap is controlled at minimum.

In the reuse of historic building, it is always difficulty to cater the new functions and represent the characteristics of the original architecture at the same time. In this case, due to the original charming architectural space is precious for the architect, so the building was changed less to the greatest extent in reconstruction process. The latter added covering of various surface materials, including various mosaic, face brick, coating and timber were removed, and then the original design material "cement" was applied to reappear the characteristics of original design. After the repairing and polishing of cement, the overall interior space forms uniform gray tone. Compounded by ferrous metal and glass, the new architectural space generates a historical and modern sense at the same time. Meanwhile, architect adopts uniform concrete ornamented ceiling, floor and wall, compounded by uniform style door, window, and floodlighting, the "mysterious and magic" temperament of original building is well highlighted again.

Moreover, the original function and the production line are often ignored in the reuse of industrial building. In this case, as a reuse project, it is very successful. As a reuse project of industrial architecture heritage, although the original circulation for the cattle slaughter is reserved to exhibit the specific history, the varies characters of architecture revealed the historical research should be emphasized in a more detail way.

Figure 4-43 The diversified activities in 1933 Old Millfun (Photo: by author)

Figure 4-44 The diversified activities in 1933 Old Millfun (Photo: by author)

Figure 4-45 The corridors after restoration, 1# building, 1933 Old Millfun (Photo: by author)

Figure 4-46 The shops in the 1#building, 1933 Old Millfun (Photo: by author)

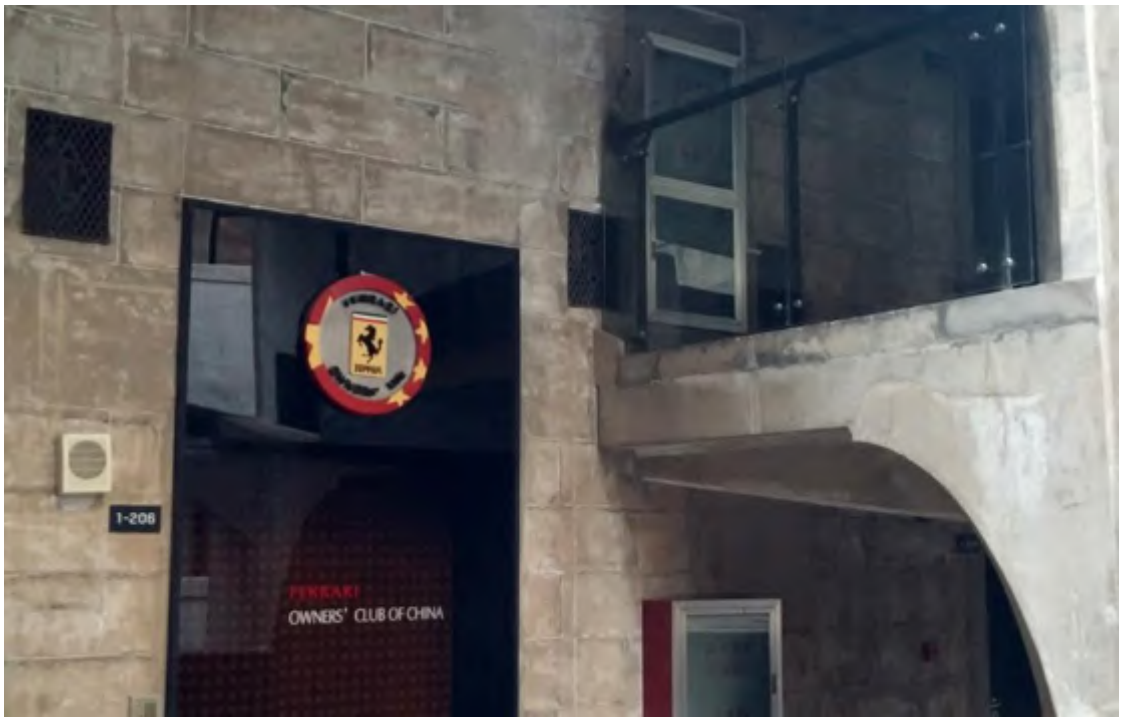

Figure 4-47 The club in 1933 Old Millfun (Photo: by author)

Chapter 5 Methodology for the Regeneration of Historic Area with Industrial Heritage--Case study: Tianzifang , Shanghai

5.1 INTRODUCTION

Located in Alley 210, Taikang Road, Luwan District, Shanghai, Tianzifang（Figure 5-1； Figure 5-2;Figure 5-3） is an area consisted of various alleyway house[1] and alleyway factories. This area can be traced back to the 1920s and has distinctive Shanghai characteristics. When the factory spaces had fallen into disuse by the 1990s, it met various threats of dismantlement. Then the artists arrived and reused the abandoned factories and houses as art shops, galleries and studios. After a dynamic changing progress of regeneration, nowadays, over 160 creative companies from about 10 countries and districts aggregate here. In this regeneration and reuse of the decaying factories and living houses, it was participated with the local residents for the first time in China. It shows characteristics of urban renewal from below and community participation by transforming the mixed industrial and residential area into art community and commercial spaces. These particularities make Tianzifang a typical case over the past twenty years and arises much discussion and arguments.

Figure 5-1 The location of Tianzifang area in Shanghai (Source：by author)

[1] The Shanghai alleyway house was a rich and vibrant street form，which occupied the ambiguous space between the traditional Chinese courtyard home and the street. It is known by a variety of names, linong being the most common, while longtang is the local Shanghainese name for it. There is also shikumen, a particular type of alleyway house which takes its name from its elaborately carved doorway, a throwback to the paifang or ritualgateways that marked the entry to residential wards in Chinese cities. See more in Gregory Bracken, "The Shanghai Alleyway House：A Threatened Typology," in *Politics and Space in East Asia's Cities* (Spring, 2013), VII, 45–54.

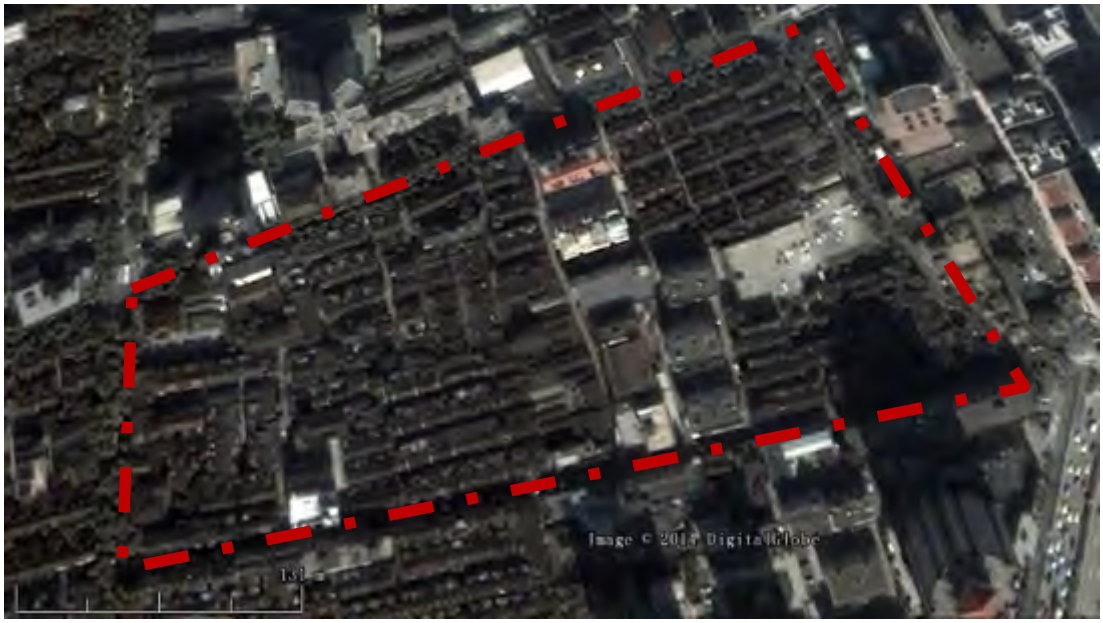

Figure 5-2 The area of Tianzifang area in the year of 2000 (Source: Google earth, edited by author)

Figure 5-3 The area of Tianzifang area in the year of 2010 (Source: Google earth, edited by author)

5.2 Research Method

The aim of this research is to explore that how did a decline historical block mingled with industrial and residential functions gradually become such a popular and vibrant place with community-initiated rehabilitation in the context of huge transform over the past twenty years. The study on its regeneration methodology will play a positive impact on promoting the reuse and preservation of industrial heritage as a catalyst in the rehabilitation of historic districts in China

Through the literature review and fieldwork, the historical geography of Taikang road area and the transformation of this area are revealed. Then the particularities of Tianzifang's dramatic regeneration process are identified in the aim of contributing industrial heritage in the rehabilitation of historic districts. The study on the regeneration program, including the site observations and analysis, are conducted to examine the problem emerged in the process from spontaneous transformation to government management and its possible solutions. Finally, this study presents a framework to understand the underlying factors in Tianzifang regeneration pattern combined with two developing approaches between "top to bottom" and "bottom to top".

5.3 Literature Review

Being a peculiar industrial form in Tianzifang, mixed with ecological traces of concession cities, alley factories became an integral part of the history of industrial development in Shanghai and even in China. In the "The Historical Rises and Falls and Neighborhood Revitalization of Shanghai Alley Factories"[2], starting with the historical causes and background of alley factories, the thesis analyzes the heritage value of its buildings and alleyway housing areas. Further, it summarizes and discusses the significance and strategies on revitalization of neighborhood of alleyway factories with the case study of Tianzifang. Regarding the development process of Tianzifang, as a researcher who participated in the regeneration program in 2007-2008, LI Yanning introduces the historical development and present situation of Tianzifang in details in his "A sample of bottom-up regeneration for historical blocks in Shanghai" .[3]

Through the analysis of methods used in Tianzifang, the thesis "The Protection of Characteristic Streets in Modern City: A Case Study of Shanghai Tianzifang" [4] discusses about the methods to protect unique streets characters, including the discussion of the conflicts between people and use of land, environmental safety problems, the relationship contradiction between new and old. As a trainee in the *Luwan District Urban Planning Administration Bureau* in 2008, LIANG Dipiao provides abundant materials in his thesis "Study on social risk management on the urban regeneration".[5] JIANG Wei focuses on how to preserve cultural values and enhance the unique identity of local features through conversion of usages and spatial reconfiguration in her thesis "Residential/Commercial/Industrial Historic Blocks in Germany and China" **[6]**.

Meanwhile, the bottom up Urban renewal of Tianzifang is discussed in the "Narration of Historic Block Renovation in Power and Concept Dimensions: Case of Tianzifang in

[2] ZUO Yan, "The Historical Rises and Falls and Neighborhood Revitalization of Shanghai Alley Factories," *Traditional Urban Industrial Heritage*, 02 (2013), 23–28.
[3] LI Yanning, "A Sample of Bottom-up Regeneration for Historical Blocks in Shanghai（in Chinese）," *China Cultural Heritage*, 2011, 38–47.
[4] KE Xiongbin and others, "The Protection of Characteristic Streets in Modern City:A Case Study of Shanghai Tianzifang," *HUAZHONG ARCHITECTURE*, 2011, 184–188.
[5] LIANG Dipiao, "Study on Social Risk Management on the Urban Regeneration" (Tongji University, 2009), p. 128.
[6] JIANG Wei, "A Comparison of Urban Renewal of Mixed-Use Residential/Commercial/Industrial Historic Blocks in Germany and China——Case Studies of Hackesche H(o)fe in Berlin and Tianzifang in Shanghai," *Modern Urban Research*, 2012, 34–46.

Shanghai"[7]. Prof.Yu Hai reads the Tianzifang from the eye of a sociologist. He argues that the conflicts in Tianzifang case are not only the struggles for dominant power within different governmental departments, but also the arguments about the ways of urban renewal and the notions of urban developments. In his another thesis "Tianzifang Experiment: the City Renewal Model Superseding the Binary Opposition of a Place"[8], he also points out that the experiences of Tianzifang are caused by inner-governmental challenges for the dominant ways of urban renewal, as well as the practices of urban context appreciation, creative industry promotion, resident interests and social justice involvements. Furthermore, the attributes and factors that contribute to socially sustainable development in the rehabilitation of historic districts with case study of Tianzifang is examined in the "Sustainable Development and the Rehabilitation of a Historic Urban District - Social Sustainability in the Case of Tianzifang in Shanghai"[9]. In terms of institutional arrangement and institutional supply system, the thesis "Research on Urban Renewal From Below: Based on Institutional Vision ——A Case Study of Tianzifang in Shanghai"[10] by HUANG Jiang uses the tool of positive analysis and draws support from New Institutional Economics, to analyze the institutional characteristics of urban renewal from below.

[7] YU Hai, "Narration of Historic Block Renovation in Power and Concept Dimensions: Case of Tianzifang in Shanghai," *SOCIAL SCIENCES IN NANJING*, 2011, 23–29.
[8] YU Hai, "Tianzifang Experiment:the City Renewal Model Superseding the Binary Opposition of a Place," *China Ancient City*, 2009, 26–31.
[9] Esther Hiu Kwan Yung, Edwin Hon Wan Chan and Ying Xu, "Sustainable Development and the Rehabilitation of a Historic Urban District - Social Sustainability in the Case of Tianzifang in Shanghai," *Sustainable Development*, 2011, 01–18 <doi:10.1002/sd.534>.
[10] HUANG Jiang, XU Zhigang and HU Xiaoming, "Research on Urban Renewal From Below: Based on Institutional Vision ——A Case Study of Tianzi Fang in Shanghai," *ARCHITECTURE & CULTURE*, 2011, 60–61.

5.4 Case Study Analysis: the Dynamic Bottom-up Regeneration Process

5.4.1 Historical Geography of Taikang Road Area (1920s-1980s)

Historically, Tianzifang area was located in the south end of the central area in the 3rd expansion zone in the former Shanghai French concession and the block was shaped in the 1920s(Figure 5-4), during which the Southern Taikang Road didn't even exist; instead, it was merely an unnamed dead-end narrow passage before Taikang Road was officially built. At that time, the north and south land parcels were an integral whole and it extended eastwards to the range of the current Chongqing South Road. In the 1920s historical map (Figure 5-5), it could be seen that the block had still maintained the farming form in Southern Chinese riverside towns at that time. Many river-ways ran through the block and few residential buildings with typical Southern Chinese riverside settlement pattern were built along the river. It was not until the official construction of the Tiakang Road (which was named as Jiaxiyi Road when it was first built) in 1926 that the connected parcel was divided into three parts: southern and northern Taikang blocks and eastern Sinan block.

Figure 5-4 The location of Taikang road in the historical map of Shanghai concessions in the year of 1914: Taikang road (now in the Tianzifang area)was located in the south end of the central area in the 3rd Expansion Zone in the former Shanghai French Concession and the block was shaped in the 1920s (Source: Chen, Congzhou, Zhang, Ming (eds), Shanghai modern architectural history (1988), SDX Joint Publishing Company)

Figure 5-5 The map of Tianzifang zone in 1920s (Source: The Album of Shanghai during the Past 150 Years,2003,Press of Shanghai Pictorial Publishing House)

With the increasingly deepening urbanization of the 3rd Expansion Zone in former French Concession, Tianzifang block had gradually shaped its unique property, namely the co-existence of various residential buildings and alleyway factories. The adjacent regions of the northern and western block were the dense area of the core upscale neighborhoods, the important justice institutions and municipal administrations and such institutions as universities, hospitals and medical institutions were gathered in the northern side, indicating that this region was situated in the border of the French Concession. The southern block was the border of former French Concession, which scattered a lot of makeshift areas and high-density residence and faced Chinese settlement across the river. Under this influence of layout, the residential buildings in Tianzifang area had obvious urban fringe and transitional characteristics and most of its southern residential buildings were alleyway houses. Affected by the adjacent architectural types, most of the residential buildings in the northern and western block were detached houses and new-styled alleyway houses. In the southeastern block, it had gathered many small and medium-sized factories and enterprises since the 1920s in order to pursue the convenient water transportation since it was close to Luojiawan-Zhaojia Bang River, the historical river in the border of the former French Concession. By now, the multi-type residence and alleyway factories had become two main functional buildings and the diverse constitutional features have extended until today. (Figure 5-15;
Figure 5-16)

According to the 1940s street map (Figure 5-6), we could see the characteristics of the industrial buildings in the block. Since it was far from the former French Concession,

some heavily-polluted industries (i.e. the hardware industry and chemical industry) were located here in a certain scale. In addition to the residential buildings, most of the block buildings had been used by small handicraftsmen and factories in such industries as chemical engineering, food and hardware industry. In 1940, there were more than 20 factories in the block and this number fell to 17 in 1947.

Figure 5-6 The functional distribution map of Tianzifang block in 1940s (Source: LI Yanning, A *sample of bottom-up regeneration for shanghai historical blocks*, 2011（03）China Cultural Heritage)

After People's Republic of China was founded in 1949, the building function of Tianzifang had gone through huge transformation. In the early days of 1950s, the policies of public-private partnership[11] and socialist transformation[12] had discarded the private workshops in this block one by one, while the original small industrial workshops had been changed as residential buildings and the previous detached alleyway houses had been turned into the public houses where lived several households later. And the existing middle- and large-sized alleyway factories had also gradually become state-controlled industrial enterprises. Having played a certain role in the primary stage of new China, the state-run factories in the block had gradually became the main economic power. However, with the development of the urbanization and the new industries, these factories had been abandoned since they failed to meet the

[11] A public–private partnership (PPP) is a government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies. See more in http://en.wikipedia.org/wiki/Public%E2%80%93private_partnership

[12] The early days of New China were a period of economic recovery. While developing production, China gradually established socialist public ownership of the means of production. http://www.chinadaily.com.cn/china/cpc2011/2011-05/10/content_12480522.htm

requirements in the new era. By the end of the 1980s, no big changes had ever occurred in the fundamental form and layout of the various parcels in the area and what had been changed was that the industrial buildings in this block had became obsolete and vacant.

5.4.2 The Transformation of Alleyway Factory Area: From Industrial Decline to Rebirth with the Help of Artists (1990s-2004)

Since the end of 1980s, the story of Tianzifang went vividly and dramatically, huge changes had begun to take place in the peaceful mixed state of the original residential function and industrial production in this block driven by the Reform and Opening-up[13]. From 1994 to 2003, some municipal industrial enterprises in Luwan District had adjusted their industrial structure, capital structure and layout structure gradually and merged with or shifted to other functions on a large scale. Among them, most of the shifted enterprises had turned to the service "third industry enterprises", as evidenced by all the industrial enterprises in Tianzifang area, where the original industrial workshops had been obsolete and vacant in quantity. For example, many factories in this block had finally changed to provide workshop rental service since these industrial enterprises had transformed as service "third industry enterprises". The transferring reform of these enterprises had promoted the comprehensive transformation of Tianzifang area functions and most of the previous industrial factories and small industrial workshops had been torn down and left unused, providing opportunities for the entry of new-typed industries. This period could also been seen as the eve of the rebirth of Tianzifang.

In addition to the influence of the "merger with or shift to others" of the alleyway factories, the building functions in the block changed because of the development tide of the surrounding real estate. In 1992, Luwan district government began to reconstruct the old areas in a large scale and Tianzifang area gradually implemented the local real estate development of "dismantling the old buildings and constructing new ones."[14]

During this period, the previous Taikang Vegetable Market had successfully moved in the abandoned factories（Figure 5-7）, bringing a new thought to Luwan Government as well as the relevant functional administrative departments. It formed far-reaching influence to the utilization models of the vacant factories in this block. This reform was proposed to use the abandoned factories instead of the national investment to improve the supporting facilities in this area.

[13] Since 1979, China has pursued a policy of reform and opening to the outside world, a policy which was initiated by Deng Xiaoping. Major efforts have been made to readjust the economic structure, and reform the economic and political systems. http://www.chinadaily.com.cn

[14] LI Yanning.

Figure 5-7 Taikang Vegetable Market had succesfully moved in the abandoned factories in1990s （Source：by author）

In early 1999, Luwan Government proposed to bring economic benefits with the featured agglomerative economies effect by enhancing the street culture characteristics. Previously, few stores dealing with the transactions of antiques as well as calligraphy and painting collection had emerged at the intersection of Taikang Road and Sinan Road in the 1990s and formed agglomerative effect. Afterwards, Luwan Government had started to expand Taikang art-ware characteristics and bring in creative artists, painters and designers at home and abroad through the assignment and replacement of old factories and warehouses in order to build Taikang Road as a street with distinctive art-ware features. This work plan had started to introduce flexible commercial activities for Taikang Road.

Later on, the utilization model of creative industry had begun to appear in the alleyway factories in this block: in December 1998, Yilufa Cultural Development Co., Ltd was founded in this area; Chen Yifei Studio was established at No.2, Alley 210, Taikang Road in August, 1999; in May, 2000. Under the support of Shanghai Municipal Economic Committee and Luwan Government, Taikang Road had conducted an overall reconstruction; in early 2001, ER Dongqiang, a photographer, had set up Hanyuan Cultural Art Center at No.2B, Alley 210, Taikang Road; in October, 2001, the 5th floor of the previous Shanghai Food Machinnery Factory located in No. 3, Alley 210 had been transformed as an art creation center; in 2001, HUANG Yongyuan, a painter had named Alley 210, Taikang Road as “Tianzifang” with the spoonerism of “TIAN Zifang”, a name of the famous ancient painter, suggesting that this was a settlement for the artists.(Figure 5-9) By 2002, Tianzifang Cultural Art Street had been primarily formed. After the continuous reconstruction to the old workshops, Taikang Alley 210 had turned from a messy and unknown alleyway factory areas to an area with artistic celebrities and cultural activities and its city status and image had begun to change. During this period, the old factories with an area of 20, 000 square meters had been reused, attracting more than 70 enterprises from 18 countries and districts to be opened

in this area and forming the characteristics of interior design, visual arts and industrial art. From the transformation of the entry of the road vegetable market to the primary formation of Tianzifang art cultural street, Tianzifang had gradually formed a utilization and operation model of the "obsolete space" and a "from bottom to top" regeneration pattern also made its first appearance.

Figure 5-8 Photographer Dongqiang's Hanyuan Cultural Art Center at No.2B, Alley 210 (left)and Chen Yifei Studio at No.2, Alley 210, Taikang Road(right) (Photo: Li Yanning)

Figure 5-9 The alleyway Factories area in Tianzifang: in 2001, HUANG Yongyuan, a painter had named Alley 210, Taikang Road as "Tianzifang(田子坊)" with the spoonerism of "TIAN Zifang", a name of a

famous Ancient Chinese painter, suggesting that this was a settlement for the artists. By 2002, Tianzifang Cultural Art Street had been formed. (Photo: Li Yanning)

5.4.3 The Transformation of Residential Area: From the Threats of Dismantlement to the Spontaneous Reuse (2004-2007)

Together with the increasingly deepening reconstruction of Tianzifang factory area (Alley 210, Tai Kang Road), it had gained increasingly popularity. Meanwhile, affected by the surrounding real estate development, alleyway houses in the central area (Alley 274 and 248, Tai Kang Road) （Figure 5-10）had been classified as the demolition of the old urban transformation. After 2000, with the development of *Dapuqiao* Commercial Zone and the favorable news of World Expo 2010, the commercial value of the surrounding areas of Taikang Road had became prominent one more time. In the *Regulatory Detailed Planning of Xinxinli, Luwan district government*[15]released in 2004, it was reported that Tianzifang should be built as a comprehensive community dominated by commercial, residential and cultural leisure activities. In the detailed planning published in 2004, it was clear that the real estate development would be tear down the old buildings and construct new ones, according to which, all the previous alleyway houses and detached houses in the south shall be replaced by high-rise buildings.

Figure 5-10 Analysis on the structure of alley space in 2010 (Source: by author. According to GUO Chunbin, "Research on the Spontaneous Rehabilitation of Old Residential Areas," in *Urban planning conference 2011*, 2011, pp. 7413–7425.)

[15] http://daj.luwan.sh.cn/lw2005/10.html

In 2004, Alley 274 and 248 of Taikang Road had been listed in the dismantlement areas and Taiwan Advanced Real Estate Co., Ltd would be the developer of this region, which was also the developer of Southern Taikang Road. After the release of the dismantlement notice, the residents of these two alleys had been prepared to move to other places. Some of them had moved away before the formulation of the dismantlement agreement, while those who stayed there were mostly senior residents. Plenty of alleyway houses in the central block remained non-occupied and the life order in the alley became gradually chaotic. However, due to the infrastructure of the rail transit in the southern Taikang Road, the over-ground development had been constrained and adjusted in various forms, increasing the difficulty in the dismantlement and development of this block. Besides, the dismantlement of the northern Taikang Block also fell behind the schedule. Under this circumstance, from the year of 2005, the vacant residences in the block were rented out rapidly, maximizing the use value before the dismantlement. Alleyway houses also introduced many service contents thereafter.

During this time, the residents in the alleys improved their living standards by letting out the houses. For example, ZHOU Xinliang, a resident in No.15, Alley 210, Taikang Road first thought whether he could leased his house to the design companies relevant to creative industries just as the old factory workshops in order to win higher rent. It was hard for him to live in Shanghai since his retirement pension was only RMB 507. Therefore, he rented his 32-square meter room in the courtyard in the 1st floor to a costume designer at a monthly rent of RMB3500 and he spent RMB1000 to live in the 2nd floor. In this way, he could have a net income of RMB 3500 every month on account of a single room, 7 times higher than his retirement payment, thus, greatly improving his living standards and his worn-out alleyway house had also been renewed by the designer and became a characteristic art room.[16]

Along with the construction of Taikang Alley 210 creative agglomeration as well as the simultaneous operation of residence dismantlement and short-term renting of the central block, Shanghai had strengthened its calls to protect historical blocks and historical buildings. In as early as 2003, according the *Regulations of Shanghai Municipality on The Protection of The Areas with Historical Cultural Features* [17], Shanghai Municipal Government had determined the 12 *Historical and Cultuaral Scenic Areas* in the central city, among which, *HengshanRoad-Fuxing Road Historical and Cultural Scenic Area* was just close to northern Tianzifang area. The attention of the public had been attracted to the functional changes the new and old alleyway houses, detached houses and alleyway factories in central Tianzifang and the resulting social response. However, the preservation and renovation of the historical blocks would inevitably come down to the governmental leadership and investment, which was also a problem in front of Tianzifang area. Without the dismantlement, the development of the block would lose the capital investment resources.

[16] LI Yanning, "A Sample of Bottom-up Regeneration for Historical Blocks in Shanghai（in Chinese）," China Cultural Heritage, 2011, 38–47

[17] http://www.asianlii.org/cn/legis/sh/laws/rosmotpotawhcfatehb1294/

In 2004, Taikang Road established *Taikang art street management committee*, which was responsible for the investment attraction of Tianzifang as an administrative body of the street committee, taking charge of the factory reconstruction in Alley 210. With the expansion of the spontaneous renting behaviors, the residents of Taikang Road organized and built *Tianzifang Shikument Owners Management Committee*, dealing with the statistics of the percentage of the non-residential function in the alleyway houses and owner contacts in 2005.(Figure 5-41)

From 2004 to 2008, the *Street Committee* and *Taikang Art Street Management Committee* proposed to the municipal government and district government by various means of the *National People's Congress* and *the Chinese People's Political Consultative Conference*, demanding to give up the original dismantlement-construction development mode and promoting Taikang Road area to expand the utilization model to the entire neighborhood on the basis of the flexible use of the resources in the alleyway factories.

Figure 5-11 The daily life in alley 248,Taikang road, in the year of 2004 (Soure:LI Yanning, "A Sample of Bottom-up Regeneration for Historical Blocks in Shanghai（in Chinese）," China Cultural Heritage, 2011, 38–47)

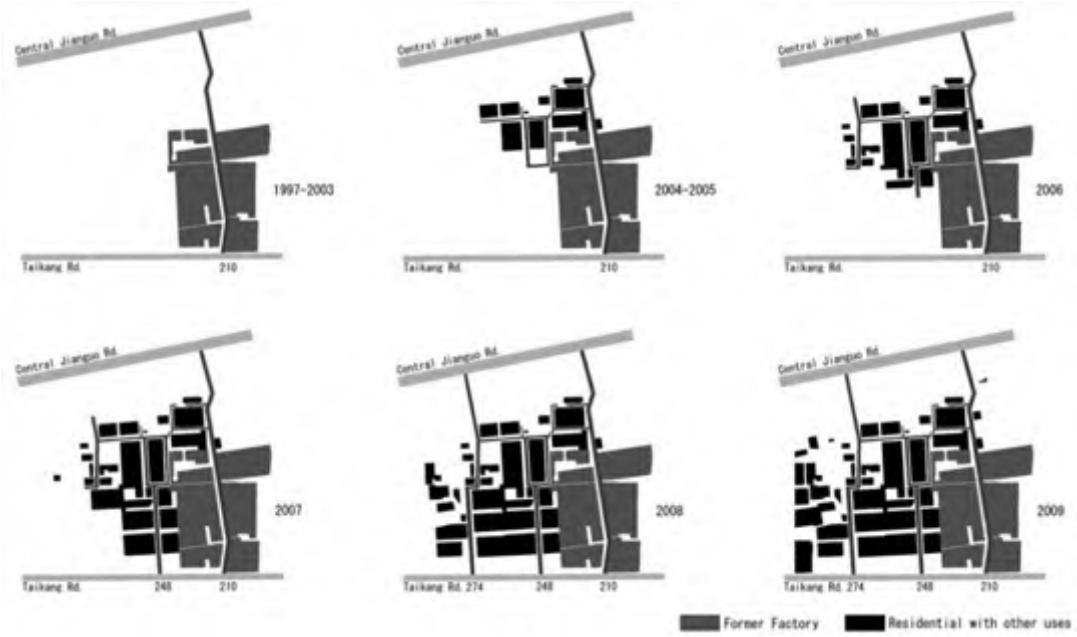

Figure 5-12 Proliferation of non residential uses into Shikumen alleyway housing area (Source: Hiroyuki Shinohara and Architect Lecturer, "Mutation of Tizifang,Taikang Road,Shanghai," in *The 4th International Conference of the International Forum on Urbanism (IFoU)*, 2009, pp. 749–752.)

5.4.4 Discussions on the Regeneration Approach: From Spontaneous Transformation to Government Management (2007-2008)

As more and more residential buildings in the dismantlement residential areas in Taikang Alley 274 and 248 had been rented, the residential buildings in this block had attracted the attention of the creative industrial zone in Taikang Alley 210. On one hand, the stores increased in the alley and the renting modes diversified, leading to "principal tenant" or "secondary tenant". On the other hand, numerous residential buildings had changed its residential functions after the renting into the functions such as catering, entertainment, leisure and clothes. On account of the uniqueness of the architectural space and location convenience, the commercial atmosphere in here warmed up quickly and the popularity increased greatly.

In accordance with the statistic data of 2007 *Luwan district Jianzhong Committee*, as of August, 2005, the 28 residents in the ground floors in northern Taikang Alley 210 had gradually rented out their houses. They contributed to repair the pavements, street lamps and environment of the alley and bought public leisure tables and chairs well as umbrellas. The regional rent increased from RMB 3500 per room in 2004 to RMB 4471. By the end of 2005, keeping the renting momentum of houses in Taikang Alley 210, the residential buildings in the central block had also accumulated a great number of non-residential stores. Instead of totally copying the industrial features dominated by the original interior design, visual art and industrial art in Tianzifang, the stores in alleyway houses increased the supporting service contents such as leisure, entertainment and catering around the requirements of Tianzifang industrial characteristics. The consumers here were most the groups working in Tianzifang or nearby.

The residents here had a variety of voices to the changes of the residential function and got differentiated into several conflicting groups, whose conflicts and contradictions mainly focused on benefit distribution and non-residential disturbance. On one hand, the problem of benefit distribution was manifested on the residents in the 2nd and 3rd floors, whose houses had no independent passages, making the rents far lower than those of the ground floor; on the other hand, the non-residential disturbance mainly included the various noises. With the introduction of bars, restaurants and design workshops, numerous air conditioning outer machines had been installed in the exterior walls, generating noises from day-and-night operation. Additionally, the bars and restaurants located in the ground floors had extended their business scope to the outdoor alleys and their business hours to early in the morning, thus greatly affecting the normal rest of the upstairs and surrounding residents. Besides, the non-residential disturbance also included sanitation and fire control. Since the various supporting facilities in this neighborhood were set for the residential functions instead of the sanitation requirements such as the sewage treatment and waste disposal in the catering service. In the meanwhile, because the service industries had gathered several folds of the original residents in the same alley, making the narrow fire-fighting access unable to get through and causing many hidden dangers in the alley. The market-oriented transformation of residential buildings into non-residential buildings made it necessary for the owners to redecorate and reconstruct the neighborhood buildings; in order to make the buildings more individual and convenient to use, some owners had also torn down and constructed the buildings at random. Since the block was under dismantlement, Luwan District Construction Department had no specific management methods and the potential safety hazards in the buildings increased day by day.

The “disorder” in the utilization model of the spontaneous transformation of residential buildings into non-residential buildings in the neighborhood buildings had been rapidly covered by the heated business sentiment. According to the statistical data of the transformation of residential buildings into non-residential buildings in the central area, it took 14 months to increase from zero to 30 stores (from early 2005 to April, 2006); however, it took only 6 months (from May, 2006 to November, 2006) to increase from 30 stores to 100 stores. In early 2007, over 140 stores had been gathered in the alleyway houses.

During this period, the stores in the alleyway houses didn’t have the integrity as creative parks; instead, they manifested an unorganized state since they are increased and substituted randomly on market request. Because two alleys in the central block were under dismantlement, the block entered into the overall renewal and utilization with the disordered introduction of the housing rental and non-residential functions, as indicated by: the excessive rents, the failure to pay taxes, the random reconstruction, the abandoned safety, the resident complaints and the frequent conflicts. This region to be dismantled had almost became an area with illegal and free construction. Although it was understandable to maximize the commercial exploitation, the relevant functional management departments had no law and regulation to follow in the management of this region.

By the early 2007, diverse plans and suggestions had formed in the governmental departments on the urban renewal of Tianzifang area. Some people believed that the identified planning requirements should be insisted, in other words, the dismantlement and construction of the central block should be launched as soon as possible and the

existing types of operation should be introduced in the newly-built frontage podium buildings on both sides of Taikang Road. Others suggested that the government should intervene into the integral management and avoid various realistic questions to develop the business models in the neighborhood streets with characteristics because they had been satisfied with the old city renewal modes of "transformation of residential buildings into non-residential buildings" in northern Taikang Road as well as the commercial atmosphere accumulated in this block. Forced by the fact that the land holding company was powerless of the development of Tianzifang area and the coming of World Expo, Luwan district government had accepted the basic strategy on the overall preservation and utilization of Tianzifang area. The government hoped to conduct a comprehensive regeneration on the neighborhood buildings with "disordered" uses by means of the flexible and diverse development and utilization models and reference of the development experience accumulated in the pre-stage Tianzifang creative parks. The government had listed Tianzifang area as the pilot project of "transformation of residential buildings into non-residential buildings" in Luwan District. The government also determined that it was *Luwan District Land Department* that was responsible for the redemption of the land to be dismantled as compensation for the land holding company to change the development land. This measure was of revolutionary and creative significance and it was also the key turning point whether Tianzifang area was to be dismantled or left un-developed.

The teamwork results of several departments in Luwan District hadn't come out until early 2008. The redemption of the demolition land had been completed and the residential land of the high-rise commercial real estate development in the original planning had been adjusted as residential land as well as commercial and residential land, which had not only guaranteed the maximum preservation of the historical buildings in this block, but also formulated detailed planning for the reconstruction of "transformation of residential buildings and non-residential buildings" as well as the auxillary facilities such as fire control and sanitation. In April, 2008, as *Luwan District Tianzifang Administration Committee* was established, the original concept of Tianzifang had been expanded comprehensively and the operation and management of Tianzifang area had turned from "spontaneous behaviors" to "government management".

5.5 Case Study Analysis: the Regeneration Program with Government Management

As mentioned above, with the transformation and renovation of the area from the end of 1980s to 2007, the original neighborhood factories in Tianzifang Alley 210 had become the office land of creative industries, which also included the workshops and art galleries of the artists. Functional changes also occurred to most of the residences in Alley 248 and 274, mainly into the business entertainment facilities such as restaurants, bars, costumes and art boutiques. In transforming the mixed industrial and residential area into art community and commercial spaces with community participation, this area was reborn from the dismantle.

After the government intervened in the regeneration of Tianzifang, there was a regeneration program conducted from the year of 2008. In terms of the benefit distribution, the management committee intervene in the residents and the merchants as the third party. On one hand, the committee conducted overall management of the imbalanced benefit distribution of the residents in different floors in order to ensure that the renting value would be maximized. It also balanced various benefits by means of annual tax return; on the other hand, the committee raised coordinated management methods to the various problems derived from "transformation of residential buildings into non-residential buildings", including the intervention and management of the key links such as business registration and the terminal use of the bank credit cards. Since 2008, Luwan district government had invested RMB 10 million in reconstructing and maintaining the public and common supporting facilities such as sewer, septic tanks, afforestation and building appearance in Tianzifang area. There were about 1500 households in the public and private houses in Tianzifang community. Almost a half of this area installed traditional toilets, which would be reconstructed as modern flush toilets. While improving the renovation and utilization of the block, the living standards of the original residents had been improved greatly. In this regeneration program, Tianzifang area had realized the transformation from "disordered" to "well-organized". It is necessary to study

5.5.1 Status Analysis of Tianzifang (2008)

5.5.1.1 Population composition

There were about 1500 families living in the public and private houses in Tianzifang area with an enrolled population of about 5000.1990s-2000s many of the younger generations had moved away from Tianzifang, leaving the senior citizens in here due to the narrow residential areas. The communities apart from the center of Tianzifang had a seriously ageing problem.

However, after the renewal and development in the past years, great changes had occurred to the social population composition and most people working in creative cultural industries had moved into Tianzifang while many local residents moved to the adjacent communities after renting their houses in the central area. Currently, Through

the survey and investigation in 2008[18], 390 out of 671 families had rented their houses and 158 enterprises had been introduced in Central Tianzifang. These people working in creative cultural industries and relevant service industries greatly differentiated themselves from the original community residents in the educational level, economic background as well as personal and cultural values. Since the social structure of Tianzifang had developed from homogenization to diversification, the social differentiation had came to prominence here. With the social stratum division, the internal conflicts had increased in the community.

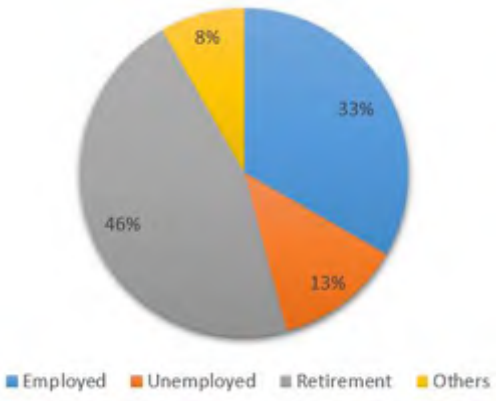

Figure 5-13 Employment Survey in Tianzifang block in 2008（Source: by author; According to LIANG Dipiao, "Study on Social Risk Management on the Urban Regeneration" (Tongji University, 2009), p. 128）

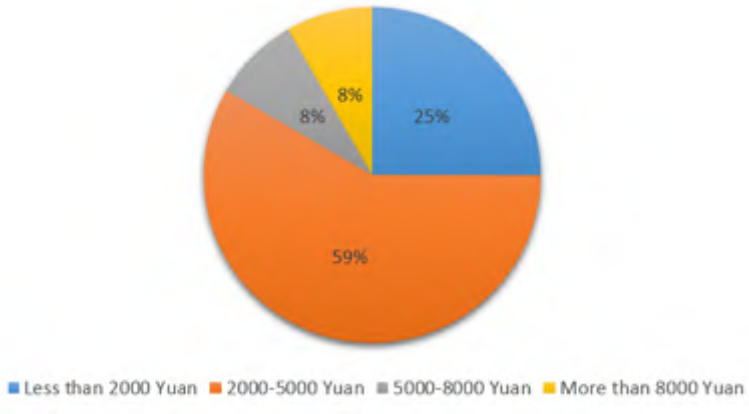

Figure 5-14 Survey on the household monthly income of residents in Tianzifang block in 2008（Source: by author; According to LIANG Dipiao, "Study on Social Risk Management on the Urban Regeneration" (Tongji University, 2009), p. 128）

5.5.1.2 Architectural Style and Space Characteristics

Tianzifang had already had the functions of industry, residence and commerce before its emergence and it stood out from the sheer traditional residential blocks and industrial factories with its diversity. The mixture of the alley and factories was an

[18]LIANG Dipiao, "Study on Social Risk Management on the Urban Regeneration" (Tongji University, 2009), p. 128.

outcome of the integration of the local life and industrial production, reflecting the requirements of the social development as well as people's living and work conditions at that time.

In early 20th century, in order to meet the huge living requirements of various populations around the world, the neighborhood residences integrated by traditional Chinese courtyard buildings and Western row buildings emerged in French Concession and International Settlement in Shanghai, where there was limited land. The enclosed block arranged by neighborhood residences had formed the basic texture of Shanghai and the internal roads had been called alley. The alley was not only a passage, but it also demonstrated different livings; provided different interactive space for residences of different levels in the narrow line space and formed the unique alley culture in Shanghai's development in the past century. And Tianzifang region was a typical neighborhood residence.

Besides, with the foreign capital as well as domestic governmental and civil capitalists' investment in the industries after the opening of Shanghai Port, a great many of small-scale factories with rough equipment, namely the neighborhood factories had been established in the neighborhood residences in the expensive Tianzifang region apart from big factories. The alleyway factory was a special product of small enterprises and manual workshops mixing in the high-density neighborhood residences. With the changes of time, their property right and nature had changed for several times; what remained the same was the mode of "factory front and residence rear" suitable for the socio-economic requirements at that time.In terms of the building type and the spatial pattern, Tianzifang had displayed itsdiversity and complexity. (Figure 5-15; Figure 5-16)

From the perspective of the architectural type, there were detached houses for the upper classes, common new-styled neighborhood residences for middle classes, the crude neighborhood residences for the lower classes and factory workers as well as large-sized production areas. They had mixed with the workshop-style alleyway factories built in the 1930s and the industry buildings constructed in about the 1970s. When it came to the architectural style, it had integrated many different styles and recorded the winding course of the socio-economic development ever since the opening of Shanghai. Before the renovation, a lot of problems existed in Tianzifang. For example, the wire got old in the block and the laying was a mess. At the same time, fire-control facilities were in a desperate demand and numerous chairs had been put in the narrow passageway, laying huge potential fire-fighting and public safety dangers for the creative cultural community with many people flows.

Figure 5-15 The Protection and the Planning of Use Concept of Taikang Road Historic Area in Shanghai: (1)Detached-House; (2)High Grade New-styled alleyway Houses; (3) Alleyway Houses with yards; (4)Ordinary New-styled Alleyway Houses; (5)Traditional alleyway factories; (6) Modern alleyway factories (7)Ordinary alleyway Factories; (Source: National Historic Cities Research Center)

	
Traditional Residential house in suburb of Shanghai	New-styled Alleyway Houses

Traditional Alleyway Houses

Classical Style Villa

Modern Residential House

Modern Western Style Public Building

Figure 5-16 The typical residential buildings in Tianzifang (Source: by author)

Different from other alleys, the alleyway factories had brought more abundant space for Tianzifang. Located among the residences, most of the alleyway factories had set the residences behind the factory. Usually, the design of the alleyway factories just needed to satisfy the minimum requirements for operation and production; therefore, the remaining buildings often had simple appearance and there was no other decoration apart from the necessary production signs. However, it was exactly these remains that preserved the functional distribution and pattern in the alleys at that time and its ups and downs had directly reflected the industrial rise and decline as well as the changes of social situations; therefore, it had long-lasting and far-reaching social-cultural significance to preserve its original space and features.(Figure 5-17)

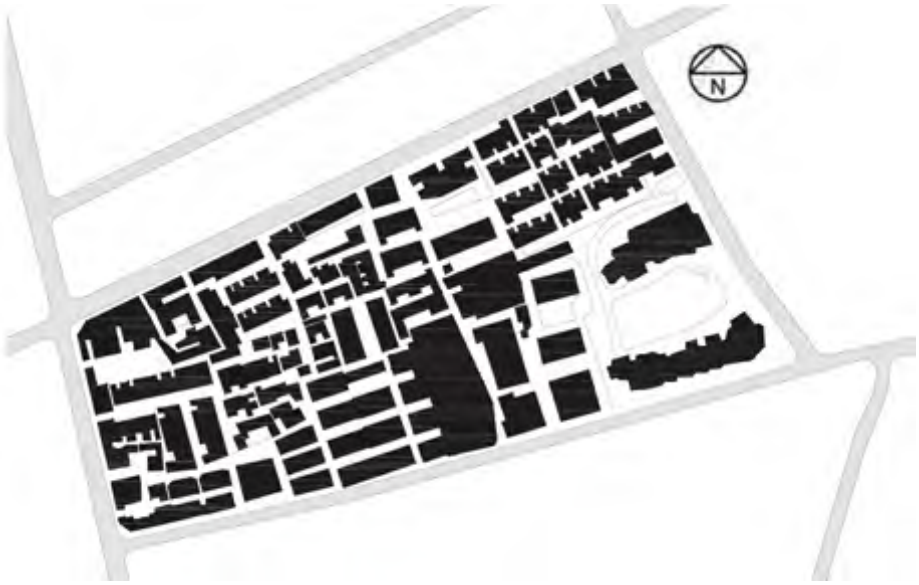

Figure 5-17 The fabric of Tianzifang block (Source: Yan, ZUO, "The Historical Rises and Falls and Neighborhood Revitalization of Shanghai Alley Factories," Traditional Urban Industrial Heritage, 02 (2013), 23–28)

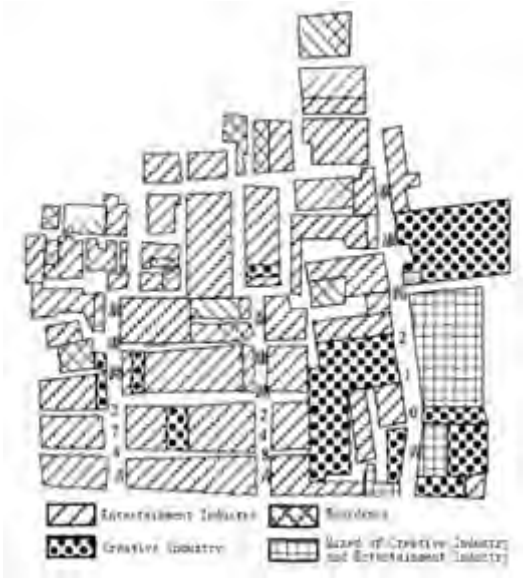

Figure 5-18 Land- use Status Map of Tianzifang area in the year Of 2008 (Source：Xiang, KONG, and QIAN Jun-jie, "An Analysis of the Development of Industrial Creative Industry and Reconstruction of Tianzifang Area in Shanghai," Human Geography, 26 (2011), 46–50)

The road system of Tianzifang was an annular pattern formed by four urban roads, including Ruijin Er Road, a urban secondary main road; Jianguo Zhong Road, a local urban road, Sinan Road and Tiakang Road. Because of lacking the parking facilities in this block, the vehicles had seriously occupied the roads, greatly affect the road traffic. As the main pedestrian walkway, the internal passage was quite circulars and inconvenient with imperfect road system. In the meanwhile, traffic facilities were in a bad need in this block, in case of any emergencies, it was difficult for the people to find a way out in the narrow passage, laying a hidden safety danger in this block.（Figure 5-19；Figure 5-20）

Figure 5-19 Analysis of traffic system in 2008（Source: edited by author .According to GUO Chunbin, "Research on the Spontaneous Rehabilitation of Old Residential Areas," in *Urban planning conference 2011*, 2011, pp. 7413–7425.）

Figure 5-20 Analysis of alley space in 2008 （Source: edited by author. According to GUO Chunbin, "Research on the Spontaneous Rehabilitation of Old Residential Areas," in *Urban planning conference 2011*, 2011, pp. 7413–7425.）

5.5.1.3 Historical and cultural Values Analysis

The formation and development history of Taikang Road was merely an epitome of Shanghai housing construction and concession construction and its historical and cultural values were mainly indicated in the following three aspects:

1. Historically, the historical and cultural scenic area in Taikang Road was nothing but an epitome of the modern and contemporary traditional community development in Shanghai.

2. The historical and cultural scenic area of Taikang Road had become an inclusive space image expression with Shanghai-style culture and various community patterns had left their own shadows in here, forming an assorted and unique community. These community patterns had integrated with and separated from each other. Under the interactive influence, it formed a mixed but coordinated modern community in Taikang Road; attracted people from different social classes to work and live here in different historical periods and become a unique image expression of Shanghai culture.

3. On account of its pleasant architectural scale, diverse building types, profound interactive space, colorful community living contents and favorable geographical location, Taikang Road had become an important carrier of Shanghai city culture.

5.5.2 The Regeneration Program (2008-2010)

In accordance with the development planning of *Tianzifang Management Committee*, the regeneration project would be conducted in 2008. The focus of the 1st phase was to welcome World Expo, improve the creative industry agglomeration dominated by traditional and modern alleyway factories in Taikang Alley 210 and built a civil cultural leisure port in Alley 248 and 274. On the premise of unchangeable residential functions, Phase II would repair and preserve the original buildings and construct new-styled communities with Shanghai culture, lifestyle and alleyway features integrating residence and industry. By injecting in cultural creation, travel & leisure as well as technical innovation, the 3rd phase would improve the residential and living standards of the original residents. Among them, Phase I would be fundamentally completed by the 2010 and the rest Western villas and garden alleyway houses would be reconstructed by stages and in groups. To conclude, the entire reconstruction plan would be finished in 2015.

Figure 5-21 Function analysis on the area of the 1st phase regeneration project （Source: by author. According to GUO Chunbin, "Research on the Spontaneous Rehabilitation of Old Residential Areas," in *Urban planning conference 2011*, 2011, pp. 7413–7425.）

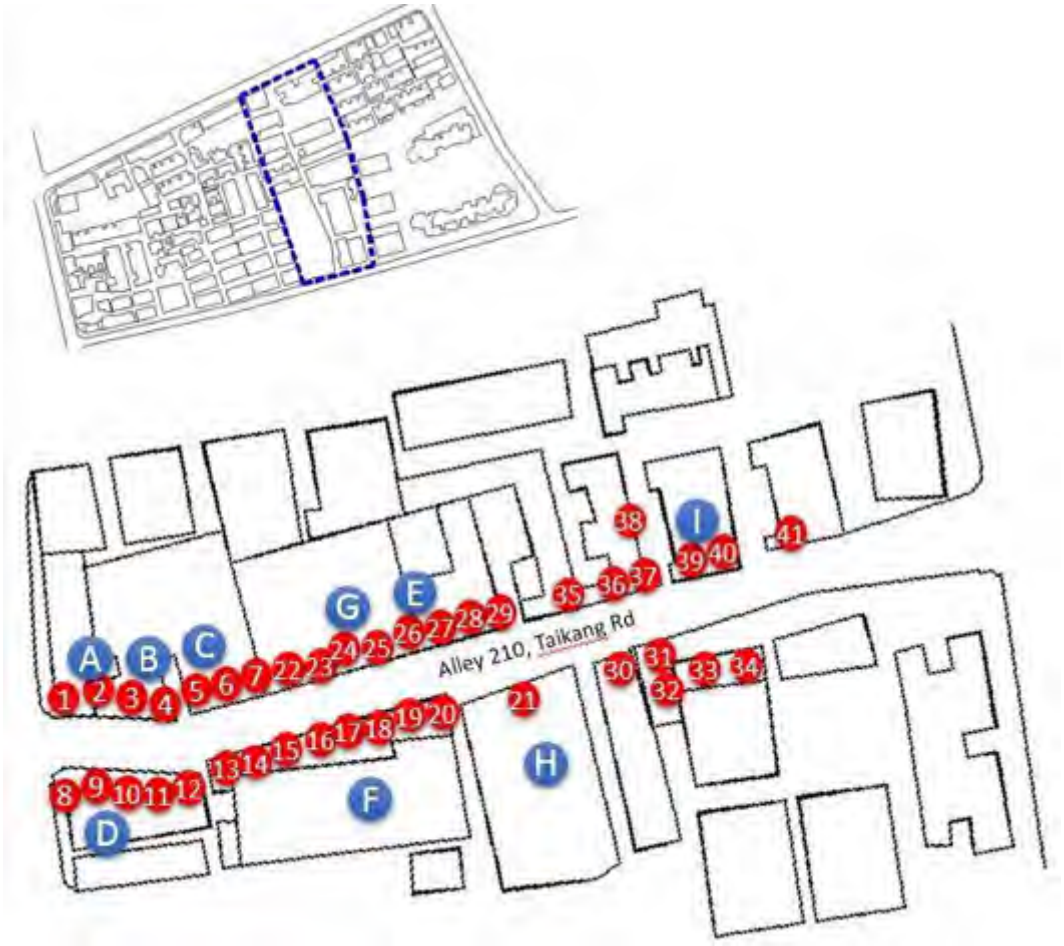

Figure 5-22 Map of the original industrial buildings and their new functions in the Alley 210, Taikang Road (Source: by author)

	Original Name of Factory	Address
A	Dazhong Industry CO.	No. 200. Tai Kang Rd
B	Yamei Chemical Company Ltd.	No. 220. Tai Kang Rd
C	Gourmet Powder Factory (with workshop)	No.44 Ln. 210. Tai Kang Rd (workshop at No. 40A)
D	China Art Paper Making's warehouse	No. 45 Ln. 210. TK Rd
E	Yongming Bottle Cap Plant	No.40. Ln. 210. TK Rd
F	Jianchen Powder Company (with warehouse)	No. 46. Ln. 210. TK Rd
G	No.2 Factory of Haihua Tannery	No. 46. Ln. 210. TK Rd
H	Kangfu Weaving Factory	No.47, Ln. 210. TK Rd
I	Yonghua Silk Factory	No. 51. Ln. 210. TK Rd
J	Jingyi Tannery	No. 190. TK Rd
K	Heyi Hat Maker	No. 50. Zhicheng Fang

Table 5-1 List of the original industrial buildings in the Alley 210, Taikang Road (Source: edited by author. according to SUN Wanyao, “The People’s Way of Conservation: The Study of Tianzi Fang, Shanghai on Its Bottom-up Revitalization,” Hong kong University, 2010, p. 90)

	SHOP NAME	BUSINESS TYPE	STREET ADDRESS
1	Friends of the Pottery Workshop	Art/Design Office	Rm. 102 8i 2/F, No. 220
2	Turn Long Photo Studio	Art/Design Office	Rm. 103, No. 220
3	Eastern Accents Jewelry Studio	Art/Design Office	Rm. 104, No.220
4	Art Legend Gallery	Art/Design Office	Rm. 105, No. 220

5	CPH Copenhage	Fashion Boutique	No. 1, Lane 210
6	Sheng Tang Mu Dan	Fashion Boutique	No. 2, Lane 210
7	Jin Zhi Yu Ye	Fashion Boutique	No. 3. Lane 210
8	Reception Room of Tianzi Fang	Government	Rm. 102, No. 2, Lane 200
9	Chen Yifei Modeling Agency	Souvenirs/ Design Products	Rm. 201, No. 2, Lane 200
10	XMJ	Art/Design Office	Rm. 101, No. 2, Lane 200
11	a Shanghai	Souvenirs/ Design Products	Rm. 103, No.2, Lane 200
12	Red,	Fashion Boutique	Rm. 101, No. 3, Lane 200
13	Rui Yuan Photography	Art/Design Office	Rm. 102, No. 3, Lane 210
14	Zhuo Zheng Zhai	Fashion Boutique	Rm. 103. No. 3, Lane 210
15	Feel Shanghai	Fashion Boutique	No. 3, Lane 210
16	Red Dawn Jewellery	Souvenirs/ Design Products	No. 3-1, Lane 210
17	Morion Corsten	Souvenirs/ Design Products	No. 3-5, Lane 210
18	Shu Yuan Consulting	Art/Design Office	No. 3-2, Lane 210
19	Hari Rabu	Souvenirs/ Design Products	No. 3-3, Lane 210
20	La 3 Cafe	Food & Beverages	No. 3-1, Lane 210
21	Gathering Building for painters	Art/Design Office	No.5, Lane 210
22	Chen Yifei Studio	Art/Design Office	No. 2-1, Lane 210
23	Deke Erh Art Center	Art/Design Office	No. 2-5, Lane 210
24	WOO	Souvenirs/ Design Products	No. 2-2, Lane 210

25	Shan Ge Clothing	Fashion Boutique	No. 6, Lane 210
26	Shanghai Shoubai Cultural & Art Ltd. Co	Art/Design Office	No. 4-2, Lane 210
27	Kylin	Souvenirs/ Design Products	No. 4, Lane 210
28	Stella Lam	Fashion Boutique	No. 6, Lane 210
29	The Yard	Food & Beverages	No. 7, Lane 210
30	Urban Matica	Art/Design Office	No. 9, Lane 210
31	JinDan COM	Fashion Boutique	No.11-B, Lane 210
32	Ecogood	Souvenirs/ Design Products	No. 11-C, Lane 210
33	in SH	Fashion Boutique	No. 11-A, Lane 210
34	Helen LEE	Fashion Boutique	No. 11-D, Lane 210
35	JIP	Souvenirs/ Design Products	No. 51-4, Lane 248
36	Shi Yi Jie	Souvenirs/ Design Products	No. 51-4, Lane 248
37	Chu Qi Bu Yi	Souvenirs/ Design Products	No. 51-1, Lane 248
38	Zhi Cheng Fang	Souvenirs/ Design Products	No. 51-1, Lane 248
39	Zhen Cha Lin	Souvenirs/ Design Products	No. 12-2, Lane 210
40	Plus+	Souvenirs/ Design Products	No. 12-1, Lane 210
41	No. 10, Tianzi Fang	Souvenirs/ Design Products	No. 10, Lane 210

Table 5-2 List of the shops renovated from the original industrial buildings in the Alley 210, Taikang Road (Source: edited by author. according to SUN Wanyao, "The People's Way of Conservation: The Study of Tianzi Fang, Shanghai on Its Bottom-up Revitalization," Hong kong University, 2010, p. 90)

According to the *Regulatory detailed Planning of NO.56 Block, Luwan District*, Tianzifang mainly included three main functional regions（Figure 5-23; Figure 5-24）. The central region was a featured commercial district, including Taikang Alley 210, 248 and 274. By virtue of the existing industrial foundation, this region combed the neighborhood space and develop featured creative industries and leisure commerce by renovating alleyway houses and other old buildings. The eastern and southwestern

areas had been planned as residential areas. In the eastern side were the early-developed high-rise buildings, including Sinan Apartment and Sinan Garden while there were new-styled alleyway houses and independent garden houses in the north of Sinan Garden and the southwestern side, which would still serve for the residential function after renovation and repair and which would also be the spare space for the development of creative cultural industries. The first floor could be used for commercial purpose while the second and above floors were still the living places. The northwest side remained to be used by Ruijin Erlu Primary School. In order the meet the requirements of land index, the school needed to consider to expand eastwards or southwards.

Figure 5-23 Analysis of Land Use State in 2008 (Source: by author. According to LIANG Dipiao, "Study on Social Risk Management on the Urban Regeneration" (Tongji University, 2009), p. 128)

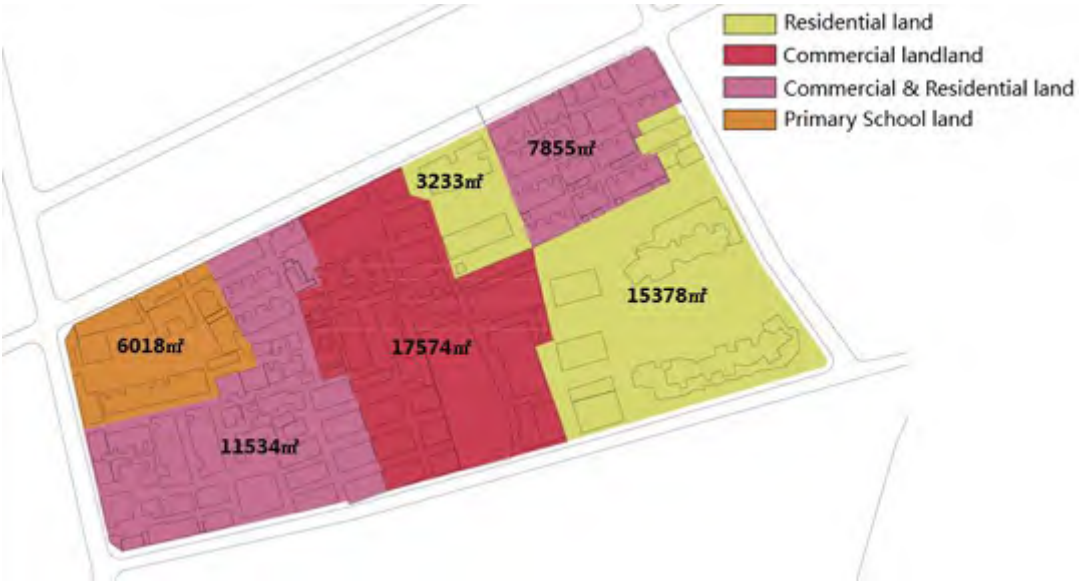

Figure 5-24 General Land Use Planning for the regeneration in 2008 (Source: by author. According to LIANG Dipiao, "Study on Social Risk Management on the Urban Regeneration" (Tongji University, 2009), p. 128)

After the renovation in 2008-2010, the traffic pattern of Tianzifang remained the previous fishbone structure with a main alley as the traffic road coming in and going out of this block and several vertical branch alleys as secondary roads(Figure 5-10). The original architectural features had been maintained completely with only some adjustments. Some of them added the modern architectural elements such as glass and steel structure. On the condition with no obvious changes in the architectural appearance, the renovation of the environmental space had also respected the original texture of the alley space with only some new properties: the original public space with distinctive levels, the semi-public and semi-private space as well as the private space had been transformed into the public space with different gradations. On the contrary, the irregular small space mingled there had broken the previously monotonous linear structure and formed a natural courtyard. (Figure 5-25)

Figure 5-25 Analysis on the building types in 2010（Source：GUO Chunbin, "Research on the Spontaneous Rehabilitation of Old Residential Areas," in *Urban planning conference 2011*, 2011, pp. 7413–7425.）

Figure 5-26 The model of Tianzifang regeneration project (Source: by author)

Figure 5-27 The tourist map of Tianzifang (Source: www.tianzifang.cn)

Figure 5-28 The construction site 2008 (Source: KE Xiongbin and others, "The Protection of Characteristic Streets in Modern City: A Case Study of Shanghai Tianzifang," HUAZHONG ARCHITECTURE, 2011, 184–188.)

Figure 5-29 The renovation of fire control facilities ,2008 (Source: KE Xiongbin and others, "The Protection of Characteristic Streets in Modern City:A Case Study of Shanghai Tianzifang," HUAZHONG ARCHITECTURE, 2011, 184–188.)

Figure 5-30 The interior of the alleyway house, 2008. (Source: KE Xiongbin and others, “The Protection of Characteristic Streets in Modern City:A Case Study of Shanghai Tianzifang,” HUAZHONG ARCHITECTURE, 2011, 184–188.)

Figure 5-31 Streetscape before the regeneration in Tianzifang (Photo: Li Yanning)

Figure 5-32 Streetscape after the regeneration in Tianzifang (Photo: Li Yanning)

Figure 5-33 The same alley before and after the regeneration in Tianzifang (Photo: Li Yanning)

Figure 5-34 Art shops and other commercial space in Tianzifang (Photo: by author）

Figure 5-35 The renovated factory in alley 210 (Photo: by author）

Figure 5-36 Most of the alleyway factories were unrecognizable except the sign with original name of these factories (Photo: by author)

Figure 5-37 The exhibition space in a gallery renovated by industrial building（Photo: by author）

Figure 5-38 The interior space of a shop renovated from a industrial building (Photo: by author）

Figure 5-39 The interior spaces of an office(left) and a coffee bar(right) renovated by industrial buildings (Photo: by author）

Historical Geography of Taikang road area

1920s : The area was characterized with farming form in Southern Chinese river-side towns

1930s : Urbanization in the 3rd expansion zone in the former Shanghai French concession British concession

1940s : In addition to the residential buildings, factories were built in such industries as chemical engineering, food and hardware industry

1950s : With two stages: "liberation" and "reform and opening up", the state-run factories in the block had gradually became the main economic power

The transformation of Tianzifang in favor of artists

1990s : The decline of factories in the block, and most of them had turned to the service "third industry enterprises". Luwan district government began to reconstruct the old areas in a large scale and Tianzifang block also gradually implemented the local real estate development of "dismantling the old buildings and constructing new ones."

1999 : Luwan Government had started to expand Taikang art-ware characteristics and bring in creative artists, painters and designers

1999-2000 : Some famous and appealing artists' Studios were established in the original factories at Taikang Road

2002 : Tianzifang Cultural Art Street had been formed.

Spontaneous reuse of the decaying factories and living houses

2004 : The residential area (Alley 274 and 248, Taikang road) had been listed in the dismantlement areas and Taiwan Advanced Real Estate Co., Ltd would be the developer of this region

2004: Taikang art street management committee was established, which was responsible for the investment attraction of Tianzifang as an administrative body of the street committee, taking charge of the factory reconstruction in industrial area (Alley 210).

2005 : The vacant residences in the block were rented out rapidly, maximizing the economic value before the dismantlement.

2005 : Tianzifang Shikument Owners Management Committee was established to deal with the statistics of the percentage of the non-residential function in the alleyway houses and owner contacts.

2005-2008: Discussion and arguments on the regeneration approaches

Government management on the regeneration and conservation

2008 : Tianzifang Administration Committee was established, the operation and management of Tianzifang Block had turned from "spontaneous behaviors" to "government management" .

2008-2009: The regeneration was to welcome World Expo 2010, improve the creative industry agglomeration dominated by traditional and modern alleyway factories in Taikang Alley 210 and built a civil cultural leisure port in Alley 248 and 274.

2010-2014: The expansion of Tianzifang block with creative industry and commerce.

Figure 5-40 the significant events on Tianzifang (Source: by author)

5.6 Rethink on the Regeneration Methodology in Tianzifang

5.6.1 The Community-initiated Rehabilitation

In China, the government-leading dismantlement and reconstruction of urban historical areas had always been a mainstream. However, it had always been a controversial issue on its specific behaviors. The architects and the planners had criticized that the thorough renovation had broken the spatial texture and numerous historical blocks had disappeared with the roar of the bulldozers. The sociologists paid attention to the social justice of the old area reconstruction, which had not only driven people away, but also driven the people's social relations. The ordinary residents had migrated from the central urban areas to the suburbs and far city areas and conceded the internal space for the wealthy, generating the gentrification in the central areas. A great deal of criticism had pointed out that it would, on one hand, lead to new differentiation and polarization in the city social space; on the other hand, it would lower the diversity of the urban community and population[19].

Viewing from the whole country and Shanghai, massive demolition and construction had been a leading mode for urban renewal. The statistical materials indicated that starting from the demolition of the dangerous and rough houses with an area of 3.65 million square meters; the large-scale old area renovation had dismantled 100-million-square meter old houses by the end of 2008 and several times of new houses had been built. In 2010, the national land sale revenue had amounted to about RMB 3 trillion, which was one third of the national fiscal revenue in the same year.[20] The land leasing revenue in Beijing and Shanghai had occupied a half of their local revenues. The mode of "massive demolition and construction" had been approved of by many people since it could build infrastructure, accelerate the urbanization process,

[19] Some works had defined the urban renewal in Shanghai since the 1990s as the ways of New Liberalism, which was not only the reason of the rise of Shanghai, but also the evidence lacking sociality and humanity. Hai, YU, "Narration of Historic Block Renovation in Power and Concept Dimensions: Case of Tianzifang in Shanghai," SOCIAL SCIENCES IN NANJING, 2011, 23–29

[20] YU Hai, "Tianzifang Experiment:the City Renewal Model Superseding the Binary Opposition of a Place," China Ancient City, 2009, 26–31

highlight the work performance and improve the residents' houses. The main impetuses behind the leading mode were the local finance and local construction. This mode to sell the land and lead the development of the central areas with capital was the key to solve the capital shortage, which had disturbed the government to satisfy the people's livelihood and construct the infrastructure. In reality, in such renewal, the bottom officials had frequently seen and dealt with the social conflicts brought by the mode of massive demolition and construction. Some people had noticed that this mode was unsustainable since it intensified the contradictions between the government and the people; therefore, they hoped to conduct the urban renewal and renovation in a small-scale and progressive way. However, it was quite hard to be realized since it failed to bring return to scale and spatial changes. Therefore, the widely-known mode was led by the government and cooperated with the developers. The government supported to develop the historical blocks commercially; invested infrastructure in the renewal projects and mobilized the governmental officials to organize residents' migration. In this process, the government and the officials had viewed this improvement as their own achievements and affirmed its social and moral values without comprehensively considering the losses of other value to the residents, including the inconvenience of the traffic, public service and work opportunities; the personal feelings and collective memories of the neighborhood livings as well as the right to live in the central area; the damage of urban spatial texture and social context as well as the disappearance of the historical blocks and local contexts.

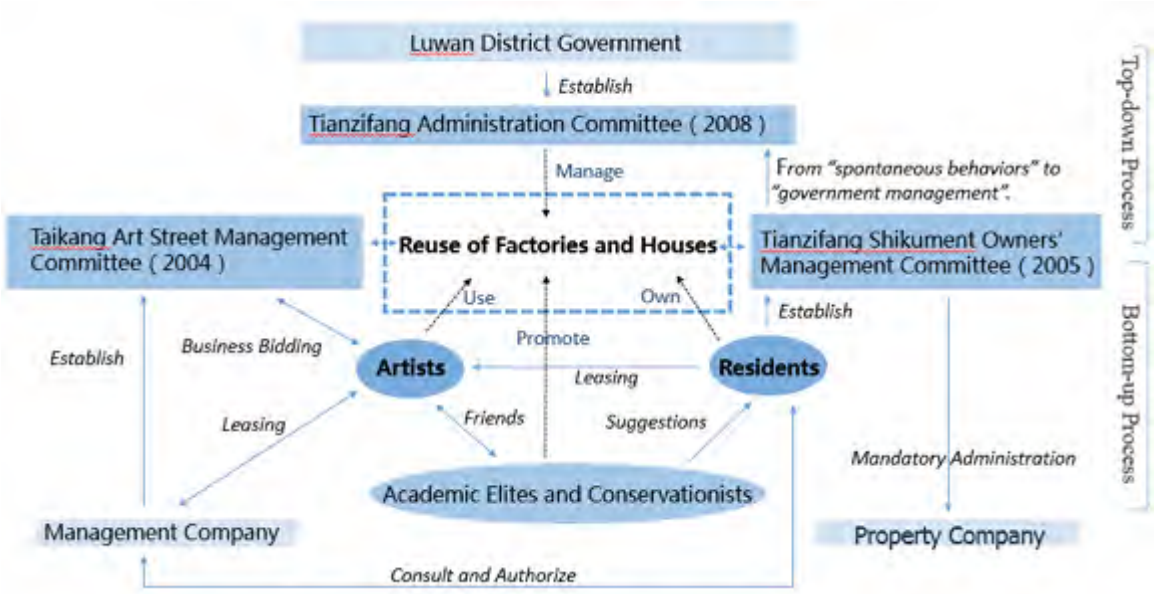

Figure 5-41 the regeneration mechanism and relationship of different subjects in Tianzifang (Source: by author. According to TONG Qianci, "The Spatial Mechanisms of Cultural Creative Industrial Development in Shanghai" (Ming Chuan University, 2009), pp. 1–126.)

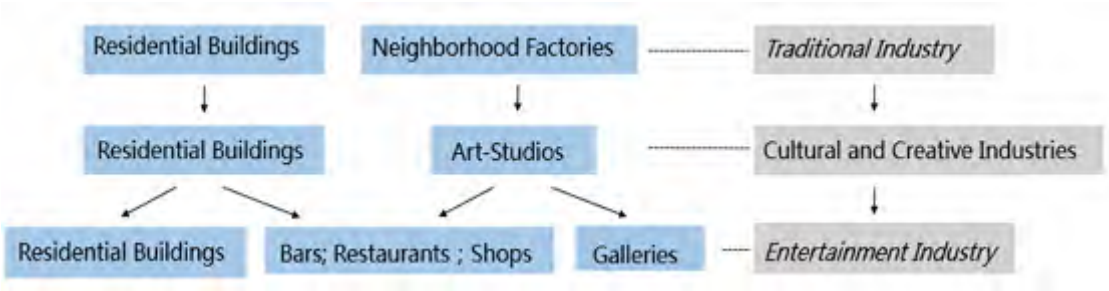

Figure 5-42 The change in industry and landscape in Tianzifang Area (Source: by author)

Tianzifang had offered a special case: there was no national capital investment but cultural injection; there was no land value development but cultural resources digging; there was no residents' migration but urban form renewal and functional improvements. The mode of Tianzifang, called "Shanghai SOHO" meant that under the institutional legitimate power and spontaneous social creativity, the city walked on an urban renewal path different from the mainstream modes. It was led by the officials, having the legitimacy of the national power; but the ideas and main power came from the society. This was also a combination of the politics and the commerce, which was unlike the mainstream political-commercial combination. The later was the alliance of the strong power and capital where there was less or no spontaneous social power or the intentions of the common people. On the contrary, the mode of Tianzifang had not only the "main theme", but also the spontaneous social power. Compared with the mainstream mode, Tianzifang was not a capital-intensive project; instead, it created cultural capital by developing cultural industries in the alleyway factories without any capital. When it finally turned the abandoned factories into the industrial space with intensive cultural significance, it not only created cultural capital and symbolic capital, but it also won the speaking right to talk with the power capital.

However, we could also see that driven by tourist economy, the building renewal and regeneration mode of Tianzifang area had broken through the bottom line of the heritage preservation of the historical block and the proportion of its commercial development had far exceeded the basic requirements of the preservation of historical blocks and architectural heritages. In reality, the industrial heritage and neighborhood buildings had been deemed as the accessory exhibition items of the tourist industry with proper respect.

5.6.2 The Leading Role of Academic Elites

Tianzifang had encountered the crisis to be dismantled for several times; however, it had been preserved in the end. Many people thought that it could be attributed to some accidential factors. As a matter of fact, the extensive discussion on the idea of urban renewal had also played a significant role. If the power to support demolition had prevailed within the government, then the entire society had shared one voice to oppose dismantlement. Instead of coming from the common people, the social voices were

mainly made by the academic leaders such as RUAN Yisan[21], ZHENG Shiling[22]and LI Wuwei[23] as well as by the central and local party newspaper such as "People's Daily" and "Liberation Daily". The government should not ignore the voices of the cultural and academic elites as well as the mainstream media. In a sense, this power fight had been more or less, equivalent to the contradictions between the public power represented by the government and the cultural power represented by the elites as well as the consensus power represented by the media.

The real influential words and ideas started from inviting the team of architects, planners and economists to Tianzifang for site investigation and case study and ended in the recommendation of Tianzifang to the public in academic language by the academic elites. RUAN Yisan approved of the renewal scheme to preserve the old buildings and blocks in Tianzifang and praised the recreation made by the artists since it had given Tianzifang abundant geographical features, highlighted the vivacious characteristics of the time and demonstrated the real life of Shanghai people. ZHEN Rongfa[24] had played an important part in making the critical step to borrow power from the society in order to protect Tianzifang. He said, "With the guidance of Academician ZHENG Shiling and Professor RUAN Yisan, I have got a thorough understanding of the value of the shape-space and urban development mode of Tianzifang; with the help of Researcher LI Wuwei and Master CHEN Yifei, I had been aware of the cultural industry value of Tianzifang". ZHEN Rongfa had constructed a significant narrative for Tianzifang in the words of academic elites: the legitimacy of the preservation of historical blocks and the advancement of cultural industry development. At the same time, on the basis of the idea to benefit the residents, ZHEN Rongfa also supported the original residents to rent out their houses to increase their incomes, create welfare value, form a benefit pattern and give rise to the idea that any forced demolition would cause instable and disharmonious political troubles. This was the most powerful but most dangerous momentum a subordinate official can build up and it was also another power borrowed from the society in order to protect Tianzifang; however, this time it was made by the bottom of the society instead of the social elites. ZHEN Rongfa had invited the residents to directly participate in the urban development project, which was not bad in theory; however, it didn't conform to the policies and regulations or even laws (i.e. the problem of "transformation of residential buildings into non-residential buildings"). What he needed to shoulder was not only the decision-making responsibility, but also the political and legal responsibilities, the serious results of which had lingered around ZHEN Rongfa's mind for a long time. By 2006, his behaviors finally got approved of by the government.

Looking back the development of Tianzifang area in the past years, innovations could be seen in the protection and regeneration of the historical areas with industry buildings . As a matter of fact, the renewal of the historical blocks in Shanghai had possessed several different modes. Many projects belonged to commercial

[21] As the Director of National Research Center of Historic City at Tongji University, Prof. Yisan Ruan is a professor and PhD supervisor of Urban Planning at the College of Architecture and Urban Planning, Tongji University. He was known as the Guardian of Urban Context, the Guards of Historic and Cultural Cities, and the Guardian of Ancient Towns.

[22] Zheng Shiling is one of the leading Chinese architects and theorists. He is a professor and head of the Institute of Architecture and Urban Space of Tongji University and also a member of the Chinese Academy of Sciences.

[23] Li Wuwei is an famous economist，Vice-Chairman of the Standing Committee of the Shanghai City People's Congress

[24] Zheng Rongfa is the ex- administrative head of the Dapuqiao area where Taikang Road is located. He is the firt one to propose the idea of reuse the alleyway factories in Tianzifang

development oriented or developer-led approach without any historical protective contents. The “bottom-up” mode adopted in Tianzifang area and innovatively differentiated itself from other cases. In order to reserve the business vitality spontaneously formed in the block as well as the fewer and fewer neighborhood buildings and factories, Luwan district government had made a breakthrough in launching the critical controlled planning adjustments and land redemption. Ever since the governmental intervention, the development of creative cultural industries had integrated with the historical heritages and the reconstruction of historical areas. Through the successful protection and utilization of Tianzifang neighborhood building, the value of industrial heritage had drawn unprecedented recognition as well as the attention of all sectors of the society. Although it was difficult to copy the mode of Tianzifang because specific historical conditions were needed, this kind of theoretical discussion was conductive for the instruction of the following renewal projects.

Chapter 6 Distinguishing the Methodology for the Reuse of Industrial Heritage in China

In China, opportunities and challenges arise at the same time in the reuse of industrial heritage. On the one hand, the reuse practice results more discussion on the industrial heritage, which gets more attention than before. On the other, through reading the reuse cases in both architecture and urban level, it can be seen that there is a lack of rational and holistic methodology to guide the preservation and reuse of industrial heritage. This part is trying to explore the protocols for the reuse of industrial architecture heritage based on the analysis of current main reuse modes and their problems.

6.1 Analysis of the Main Reuse Modes

6.1.1 The Government-leading Reuse Mode

In term of government-leading reuse mode, because the reuse dominated by the government, the main objects are industrial buildings and industrial zone whose property rights belong to the government or state-owned enterprises. These reuse projects have large scales, play an important role in urban transformation and are often as demonstrations of the government, such as NO.10 Steel Plant of Shanghai Steel Company, Shanghai brewery ,Beijing 751 Design-Park, Beijing Capital Steel Group, etc.

Under the government's dominance, the reuse of industrial heritage has the characteristic of social development. From the urban master planning, the government expropriates the idle industrial buildings and sites to construct public facilities. For example, in 1980s, NO.10 Steel Plant of Shanghai Steel Company moved out. The original factory was idle for almost ten years. Because the location of the old factory was good, many developers wanted to develop this land. Considering the whole city public space and improving the environment quality, in the master planning of Shanghai, the plot of NO.10 Steel Plant was defined as public facilities land, such as culture and service. In 2005, after being renovated into Shanghai Sculpture Space, the public space is very popular with the public[1]. In another case, after 751 factory was out of production, Beijing municipal government decided to convert some parts of the original site into a city park with the theme of "industrial heritage exhibition". The designers reorganized the original space with modern landscape design method and created high-quality urban open space with historical connotation. Generally speaking, this reuse mode dominated by the government mainly focuses on the public interest and the manufacturer itself cannot receive a good economic return. Therefore, there are few reuse projects according to this pattern currently.

Another characteristic of this reuse mode is to depend on government's administrative power and have quick effect. However, there are some problems sometimes. The transformation of Shanghai Brewery is a typical case. Although the construction of

[1] L. Wang, "Memory and Revival of a City: Practice in Shanghai Sculpture Space," *Red Town*, 1 (2006), 4–8.

Meng Qing Garden had positive significance to the improvement of the surrounding environment, there were only three isolated buildings of Shanghai brewery left[2]. From the perspective of the integrity of the industrial heritage protection and reuse, the government's unilateral push caused irreparable damage. Although the government has very strong administrative power and can push the transformation quickly, the transformation of industrial heritage often requires patience and has to consider the factors.

6.1.2 The Enterprise-leading Reuse Mode

The enterprise-leading reuse mode refers to through the transformation by the enterprise itself, the enterprise makes use of the advantageous location of factory and runs the tertiary industry or rent out directly. At the beginning of the industrial transformation, many companies are shut down and generate many laid-off workers. Some factories rent the workshops to earn money after simple renovation. There are typical cases, such as Shanghai M50, Beijing 798, etc.

After Chunming textile Factory was shut down in 1999, the first problems were the idle land and laid-off workers' settlement. At first, the district government had leased the land to the real estate developers, who formulated the master planning to demolish the original industry site and to replace of high-rise residential buildings. At the same time, because the old factory buildings with capacious space were rented in cheap price, many artists began to lease workshops as studios. By collecting rents, the factory solved the problem of the laid-off workers. With the opportunities of artists, the factory manager wanted to transform the workshops into a cultural creative industry agglomeration area. This idea was recognized by the Shanghai municipal government. Then the government's attitude turned from demolition to reservation. The municipal bureau for urban planning changed the regulatory detailed planning. Through the coordination with the government and the factory manager, the original planning by the developer was changed into a comprehensive development plan to form a creative industry agglomeration area[3].

It can be seen that, the reuse of Chunming Textile Factory was spontaneous at the beginning. Through the enterprise and the artist's efforts, the idea of transforming the original factory into M50 Creative Industry Agglomeration Area received support from the municipal government. There are three forces affected the transformation of industrial heritage. The first was the power of the original enterprise. Chunming Textile Factory leased and managed the workshops to obtain the economic benefits. In order to preserve the morphology of creative industry park, they also controlled the original style and features of industrial buildings and did not allow large-scale changes. The second was the artists' spontaneous force. When this industrial site was faced with the crisis of demolition, the famous artists could call for more public attention to this event; the third is the intervention force of the municipal government. After the government

[2] HUANG Yi-ru and MAO Wei, "Between Demolition and Conservation:Review of the Conservation of the Workshops in Union Brewery Ltd.Shanghai," *TIME+ARCHITECTURE*, 02 (2006), 88–93.

[3] LIU Cheng and LI Zhen, "The Reuse Patten of Shanghai Industrial Heritage : Yesterday,Today and Tomorrow of Industrial Heritage over Expo 2010," *Architectural Culture*, 2011, 177–182.

realized the importance of creative industry, the original plan would be changed. Bases on these factors, M50 obtained the continuous operation.

In the early stage of the industrial heritage reuse, this mode was adopted by most of enterprises. The advantage of this reuse mode lies in the dominance of the enterprise itself. As long as the business goes well, the company can ensure the long-term interests. But not all transformations will be successful. The main influence factor is the geographical position. Not all factories are located in the center of the city and have convenient traffic. In addition, the market positioning of new function after reuse is also important.

6.1.3 The Developer-leading and Government-assisting Reuse Mode

Under the policy of land nationalization in China, in the process of industrial site turned into the new function, the government's policy decides the industrial heritage's fate. From the beginning of the 21st century, under the support of government, combining industrial heritage with creative industry and the transformed into creative industrial agglomeration area are very popular in many cities. the characteristic of this reuse mode is to rent industrial heritage resources from the enterprise and then conducts transformation and packaging for second rent, such as Shanghai Bridge 8 and 1933 old Millfun, etc.

In the case of Bridge 8, developers rented the right to use former Shanghai Automotive Brake Factory for 20 year, inviting Japanese architects to transform it into office building[4]. The planning and operation are very successful. Rent standards had reached the level of Shanghai *Grade A* office, and meanwhile the development of surrounding areas had been promoted. In general, the reuse mode of Bridge 8 is a marketization development under the guidance of government with the creative industry development strategy. Government and the real estate developer perform different roles. The government is a server role, not involve in the actual operation and management. The reconstruction, development and leasing and so on are mainly operated by the real estate developer. Generally, because of the operation under the professional developer, the reconstruction management of such reuse pattern is good, while the transformation lays stress on commercial functions. The characteristics of such pattern are that the original property owner (the enterprise) could obtain considerable gains without wasting industrial heritage resources, while investor (the developer) earn profits through management. However, the intervention by government is needed for the frequent contradiction between the original property owner and the developer. The transformation of the 1933Old Millfun is also a case of developers leading and government assisting. Shanghai Creative Industry Center[5] was founded in 2006, and began early investigation work for Municipal abattoir. The same year, Shanghai

[4] SEIICHI HIROKAWA, KENJi HANTANT and HIDEKI AZUMA, "The Fashion Design Centre of No.8 Bridge in Shanghai," *Time+ Architecture*, 02 (2005), 107–111.

[5] In 2006, one private enterprise entitled "Shanghai Creative Industry Investment Co. Ltd." was collectively established by the three shareholders of Shanghai Creative Industry Center, Shanghai Automotive Asset Management Co. Ltd., and John Hawkins - consultant of the center. See more in Jun Wang, "Shaping Distinctiveness in Culture-Led Urban Regeneration:public-Private Partnership in the Project of Red town,Shanghai," *Cities*, 26 (2009), 318–330 <doi:10.1016/j.cities.2009.08.002>.

Creative Industry Center and the owner of abattoir have achieved agreement on renting the abattoir for 15 years which got full support of Government of Shanghai Hong Kou District. For the successful development of 1933 Old Millfun, the government built a new road for the project and therefore rearranged the traffic flow of some surrounding road, and updated the relevant public facilities. The auxiliary operation of the government has reduced the pressure on project development, meanwhile improving the quality of the transformation.

In term of the reuse mode, Bridge 8 and 1933 Old Millfun are similar, both of which are transformed of industry building by developers funds and then gain supply from government. However, there are also some differences. The development approach of Bridge 8 is simpler, which is invested and operation managed by a developer alone and the government mainly provides policy support; while the 1933 Old Millfun is operated as a team. From the sources of funding to transformation operations, are all carried out by Shanghai Creative Industry Center with different subjects, thus biggest dispersing the development risk and gathering more supports. Except for the policy support, the Old Millfun 1933 has got the actual support for the transformation of infrastructures from the government. In the treatment of industrial heritage, Bridge 8 is purely commercial operation with casual attitude in dealing with the transformation. Developers of 1933 Old Millfun also actively seek cooperation with academia, reserving useful reuse methodology for the transformation of industrial heritage.

6.1.4 "Bottom-up" Reuse Mode with Residents Participation

In some cases such as Beijing 798, Shanghai M50, etc., the artist's spontaneous behaviors help the industrial heritage attract public attention and finally are preserved and reused. These kinds of reuse are with "bottom-up" character. However, there are only a few industrial heritage "bottom-up" reuse with residents' participation. Tianzifang is a rare example in China.

The development of Tianzifang was without government fund and basically relied on private capital. Its reuse is a way of self-sufficiency, which determined Tianzifang's different reuse methods from the large amounts of cost for transformation in bridge 8 and in 1933 Old Millfun. The capital of Tianzifang industrial buildings renovation in the first phase mainly came from the tenants. Their payments were used for the infrastructure reconstruction. Instead of government fund, Tianzifang turned over a large amount of taxes to the country every year. The second phase of Tianzifang was residents' spontaneous behavior. With the corresponding rent, the living standards of residents were greatly improved. At the same time, the residents provided capital together to renovate the floor in alley and street lamps, etc. They also added leisure chairs and umbrellas, etc. In the renewal of the old buildings, the residents spontaneously set up a building protection team and formulated strict rules for tenants. The tenants were not allowed to destroy the old buildings and signed agreement of not destroying the original architectural style [6]. Without developers, through the

[6] Esther Hiu Kwan Yung, Edwin Hon Wan Chan and Ying Xu, "Sustainable Development and the Rehabilitation of a Historic Urban District - Social Sustainability in the Case of Tianzifang in Shanghai," *Sustainable Development*, 2011, 01–18 <doi:10.1002/sd.534>.

self-sufficient way, Tianzifang made its average rent lower than the creative industry agglomeration area. Even some young artists with ordinary economic capacity can afford.

6.2 Analysis of Main Existing Problems

6.2.1 Cognitive Limitations

Since some artists have rented some workshops and warehouses as their studios, industrial heritage in China began to get attention. With the popularity of this kind of practice in some cities and the increase of the news reports for these events, the concept of industrial heritage becomes more and more popular among the public. Some conservationists consider these events as an opportunity and begin to call for the protection for industrial heritage. At the same time, with the government's promotion for creative industry agglomeration area, the developers are involved in this activity and develop large-scale industrial heritage.

Compared to the situation in Europe, due to the lacking of industrial archaeology and the unawareness of heritage's value, the process of understanding for industrial heritage in China has its own characteristics. On one hand, many people view the waste and old industrial buildings and facilities as the obstacles of city development and they are not aware of the importance of protection and the significance of reuse. These cognitive limitations cause the misunderstanding of industrial heritage. When people are calling on to protect the city's history and the urban memory carrier, they usually attach importance to the protection of historical buildings and blocks but turn a blind eye to industrial buildings and sites where people live and work for generations. They carry on the large-scale demolition and renewal. On the other hand, although at present there are many cases of industrial heritage reuse, in their practice, with industrial heritage protection as a slogan, they are not completely aware of the real value. Regarding on reuse methods, the questions such as how to excavate the value of industrial heritage, how to decide to dismantle, keep or renovate, are still ambiguous. The management system for protection and the reasonable methodology for reuse have not been formed yet.

6.2.2 The Imperfect Protection System

Because the protection management of industrial heritage is under the current cultural heritage protection system, there are some problems of industrial heritage protection, although the specific protection measures for the industrial heritage continue to be developed and perfected in cities like Shanghai and Beijing[7]. The first is lacking of sufficient industrial heritage survey. Except shanghai and Beijing, there are numerous other cities with industrial production as the leading industry in modern times. However, many industrial heritage are scattered in every corner of the city and their value has not yet been discovered. The survey, mainly including of historical survey and status survey,

[7] See more in *chapter II- Exploring the Reuse Ways of Industrial Heritage in China*

is the essential premises of protection and reuse work. For lack of special census about industrial heritage, many important industrial buildings, industrial facilities are classified into the scope of demolition in urban development.

The second is for lack of sufficient value assessment. Value assessment is the key to authenticity and integrity in the process of industrial heritage protection and reuse. According to *Compiling Guideline of Protection plan for Major Sites Protected for their Historical and Cultural Value at the National Level* issued in 2004, the industrial heritage listed as cultural relics protection units need value assessment and protection strategy formulation. However, the compile requirements do not stipulate special investigation report files. Therefore, value assessment has been omitted in many cases.

The third is the singleness of the protection object. Now most industrial heritage are listed in protection in the form of individual building and only a few entire industrial zones are listed in protection[8]. The surrounding environment and integral layout which play important roles in the value of industrial heritage usually are not included in the scope of protection. Among the protection list of historical zones, most belong to living and public land. The number of industrial zone listed for protection is small. The coverage of protection system for industrial heritage should be enlarged. Through the delineation of the industrial heritage protection zone, the overall protection in these areas should be conducted. By doing so, both region collective memory and the characteristics of industrial development can carry on. Meanwhile, another problem is that much attention is paid to the tangible heritage such as plants, while it is not enough to protect the intangible heritage with special significance and representation, such as the industrial technology, production process and enterprise culture.

6.2.3 The Simplified Reuse Mode

Represented by Beijing and Shanghai with relatively developed modern industry, they went through similar stages roughly in terms of industrial heritage reuse: in 1990s, for economic self-rescue purpose, part of the factories out of production rented the workshops spontaneously. There appeared a lot of furniture stores, building materials markets and food and beverage stores, etc. which renowned from spacious industrial buildings; from the end of the 20th century to the early 21st century, a group of artists spontaneously established their studios based on idle factories and received recognition and support from government after drawing social attention, which directly led to a dominant mode of reuse supported by the government--the creative industry agglomeration area. It should say that from spontaneous transition to government support and from one case to group present a benign development trend. However, compared to the fact that a large number of industrial heritage were torn down and vanished in the process of urban renewal, the reuse process was still too slow. The reuse ways used in this process are not diversified enough. No matter in the big cities such as Shanghai and Beijing or some other cities, they mainly focused on transformation into “artist studio” “gallery” “creative industrial park”. These reuse methods are difficult for small and medium-sized cities with relatively weak economic strength and low cultural

[8] These industrial areas in protection include the Shanghai Yangshupu Water Plant in Shanghai, the Capital Steel in Beijing, industrial area along Suzhou River. etc.

quality to realize.

In this rehabilitation of industrial heritage, one of the main characters in the reuse is the operation with the strategies of cultural-led regeneration. It is not a rare way in the transformation of industrial buildings in the international level. Driven by global city making, not only Shanghai, but also Beijing, sees culture as a key to bolster a new economy and to deal with decayed urban sites.[9] Both municipal governments began to take the creative industries with industrial heritage as a new driver for the urban development. However, many of creative industry agglomeration area transformed by industrial heritage go into the reuse mode of "bar and cafe". The definition of Creative *Industry Agglomeration Area* should be: a specialized zone, under the guide of government, dominated by cultural creative industries, with a corresponding management system, public service facilities, conducts the production and sale of creative products[10]. Its main functions include research and development, training, incubation, production, exhibition and trading, etc. but in many cases, there appears business circle "with wine, no ideas; with coffee, no history". They show strong commercial atmosphere without the culture and creativity, which is far from the intent of creative industry agglomeration area. At the same time, the ability to improve the space quality is relatively weak. There are very few cases combining reuse with surrounding service facilities or the revival of community.

According to objects of reuse, the reuse mode can be divided into comprehensive reuse and monomer reuse. Comprehensive reuse mode refers to the comprehensive development of industrial heritage within the area. It could combine the industrial tourism resources with the surrounding non-industrial tourism resources effectively to form a special tourism route. China's transformation for industrial heritage often focus on individual buildings or single area and has not formed a mature and integral development system. The main reason is for lack of the unified planning for industrial heritage. Especially the cooperation mechanism cross different provinces has not yet formed, which makes the reuse of industrial heritage resources still scatter. The "linear" or "network" distribution pattern has not been formed. For this point, the European Route of Industrial Heritage[11]provides us a very good case to study.

6.2.4 The Lack of Public Participation

Public participation is "a process by which people, especially disadvantaged people, can exercise influence over policy formulation, design alternatives, investment choices, management, and monitoring of development interventions in the communities".[12] It is also defined as "the redistribution of power that enables the have-not citizens to be

[9] J Wang and S Li, "The Rhetoric and Reality of Culture-Led Urban Regeneration-A Comparison of Beijing and Shanghai, China", 2009, pp. 875–888.

[10] Jane Zheng and Desmond Hui, "Making Creative Industry Parks in Shanghai: The Urban Regime and The 'Creative Class,'" *Development*, 2005, pp. 1–21.

[11]The European Route of Industrial Heritage (ERIH) is a tourist network of important industrial sites, which leads through European countries like Great Britain, France, Italy, Germany, the Netherlands, Belgium and Luxemburg. http://www.erih.net/topmenu/about-erih.html

[12] B. Bhatnagar and A.C. Williams, Participatory Development and the World Bank：Potential Directions for Change (Washington, DC: TheWorld Bank, 1992), p. 195 <http://ideas.repec.org/p/fth/wobadi/183.html> [accessed 14 May 2012]..

deliberately included in the future".[13] In dozen years, Industrial heritage in our country gradually attract more attention and reuse. We can see the participation of artists, developers and government. However, there are very few participations of the public and civil conservation organization. In the process of urban regeneration, the residents pay more attention to their own interests, such as employment, housing, urban infrastructure, compensation, etc. For some public interests such as the protection of the historical and cultural environment, the layout of the urban roads, the relationship between old city reconstruction and the overall urban development are neglected. This phenomenon reflects the reality of the residents' low awareness for protection, but it cannot be denied the fact that for a long time there are very little guidance from the governments and the planners. in our country, public participation is still in an early stage in terms of public participation' legislation, organization and the operation method.

Through the conservation organization to protect industrial heritage is a common protection mode in western countries. In the process of protecting some individual buildings, for the property owners do not want to save the buildings, the conservation organizations raise special protection foundation and buy property right to avoid building demolition with the corresponding funds. They set up corresponding foundation for subsequent management and protection. From the history of industrial heritage protection practice, through economic lever to realize property rights transformation was the main method to protect industrial buildings with a small scale and low real estate value[14]. For large-scale industrial zone in the cities, because the land area is great and there are a lot of industrial relics need to be dealt with, it is extremely hard to rely on private capital to buy the property right. Therefore, dominated by conservation group, rather than a simple alienation of property right, is a major form of protection method. For instance, the machine hall of Germany's Zollverein[15] was recognized by a few people who understood the value of industrial heritage. Through the power of the team, the value was further explained and recognized by the owners, development institutions and government agencies. Thus they were persuaded to protect industrial heritage.

For China whose government is in a relatively powerful position, conservation organization's functions in the industrial heritage protection are also under restrictions. But in recent years, the "bottom-up" reuse mode has received more and more attention. For instance, Shanghai Tianzifang has become the focus of Chinese and international scholars because of the residents participation. However, this attempt lacks institutional guarantee and how much influence it has also need observation. Recently, some critics on Tianzifang mainly focus on the gentrification. With the regeneration, the neighborhood has been changing, so does the everyday life of the people live there. "The people working in these sectors not only run the local businesses, but also use them, constituting a complex system … The quarter loses its traditional working class

[13] Sherry R. Arnstein, "A Ladder Of Citizen Participation," Journal of the American Institute of Planners, 35 (1969), 216–224 <doi:10.1080/01944366908977225>..

[14] Carol Berens, Redeveloping Industrial Sites: A Guide for Architects, Planners, and Developers, 1 edition (John Wiley & Sons, 2010, 2010), p. 256.

[15] Anne Brownley Raines, "Wandel Durch (Industrie) Kultur [Change through (industrial) Culture]: Conservation and Renewal in the Ruhrgebiet," *Planning Perspectives*, 26 (2011), 183–207 <doi:10.1080/02665433.2011.550443>.

features in favor of specialization in the consumption-production of culture".[16] Meanwhile, the value rise of the surrounding real estate by the process of urban transformation always pushed out the local residents. "Although gentrification helps reserve physical forms on districts and extends historical landscape, yet it is bad for maintaining a social network on districts and passing down intangible heritage".[17] Therefore, in the regeneration of historic area with industrial heritage, how to make the residents not be driven out is a question.

6.3 Protocol for the Reuse

For the situation and existing problems of the industrial heritage reuse in China, there is a need to construct a comprehensive protection and reuse system. This study tries to establish a set of reuse protocols for the industrial architecture heritage18 through two phases: assessment phase and reuse phase. Assessment phase is mainly through investigation and assessment to find the reuse object and establish its values, while the reuse phase is the guides and restrictions for reuse.(Table 6-1)

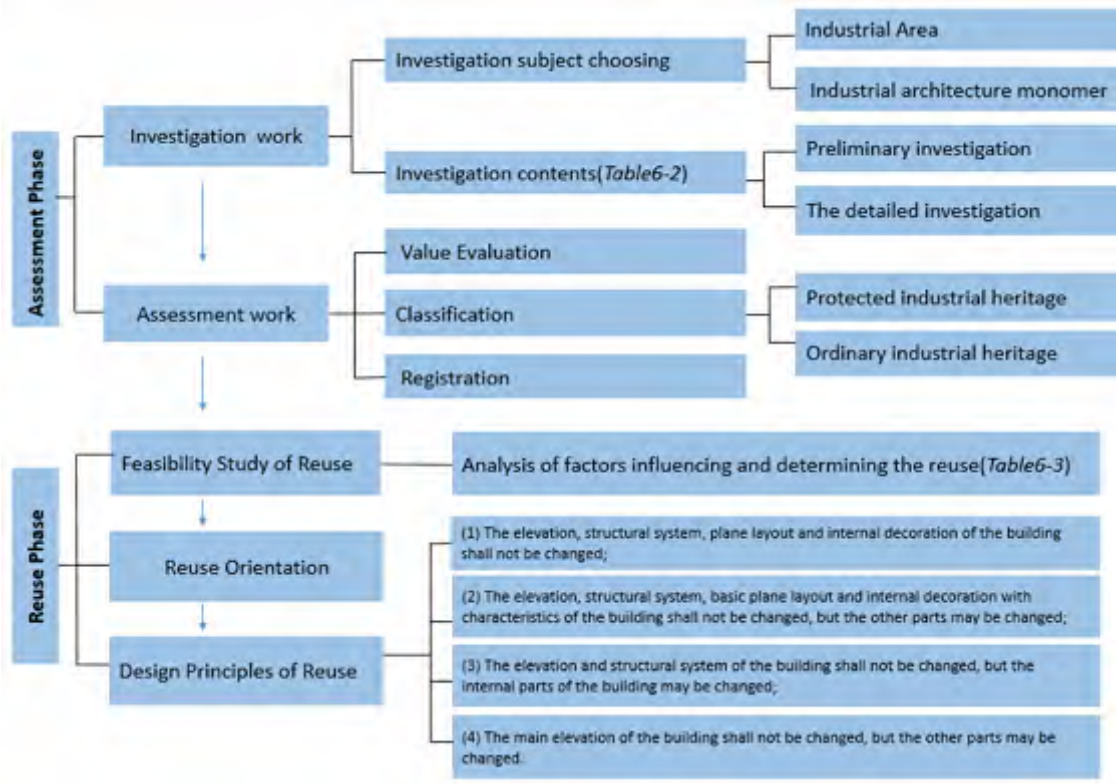

Table 6-1 reuse protocols for the industrial architecture heritage (Source: by author)

[16] Laura Bovone, "Fashionable Quarters in the Postindustrial City: The Ticinese of Milan," City and Community, 4 (2005), 359–380 <doi:10.1111/j.1540-6040.2005.00143.x>.

[17] Zhang Song;Zhao Ming, "On Gentrification in History Protection and Its Countermeasure," CHINA ANCIENT CITY, 2010, 04

[18] Industrial Architecture Heritage is the immovable tangible industrial heritage in modern and contemporary time (after 1860), including the industrial buildings and industrial sites. This definition is according to the definition provided by the Architectural Society of China established in the Industrial Architecture Heritage Academic Committee (IAHAC), which is the first academic organization for industrial heritage preservation in China.

Internationally, the protection system for architecture heritage are divided into designation system and registration system. The former is based on the approval from the state and local governments, while the latter depends on the self-initiated preservation effort and provides instructions, advice and recommendations when the property holder reports a change in the state of his asset.[19] In China, the cultural heritage protection system is a designation system, which is not suitable for the protection and reuse of industrial architecture heritage. Only the most significant industrial architecture heritage can be listed as protected cultural relic by designation[20]. By contrast, the features of register system are: it expands the concept and scope of building protection; the protection objects from single specified boutiques are extended to abundant and diverse historical architecture and the comprehensive environmental conservation of landscape. The protection way is turned from a single and frozen type into the comprehensive and flexible protection with environment and history; the planning management is turned from static, negative control intervention model to the dynamic, actively guiding mode. Compared with the protected cultural relics, the registered industrial architecture heritage can be rebuilt and their functions can be changed. If there are special needs, through the strict examination and approval, the buildings can be relocated or dismantled. Through the exposed problems of industrial heritage reuse under the existing cultural relics protection system, we can see the necessity of adopting a way combining designation and registration.

6.3.1 Assessment Phase

The assessment phase mainly include investigation and assessment work. The industrial heritage as a special cultural resource, its value affirmation, record and study depend on discovery and the census is the foundation and guarantee. In the face of a large number of industrial relics, it is only through the census to grasp first-hand information and then establish the industrial heritage list. For the industrial heritage's registration standard is different from other cultural heritage, it is necessary to set up a specialized department which is responsible for the investigation and register. The census, affirmation, record and study is a process to attract enterprises and related personnel to join in protection. At the same time, it should also encourage the participation of some Non-Governmental Organizations and academic groups to investigate the vanishing industrial heritage.

6.3.1.1 Investigation Work

Large scale and comprehensive survey is usually referred to census registration, while further work is investigation. Investigation includes records on site, preliminary studies

[19] http://jikimi.cha.go.kr/english/qa/faq_01_08.jsp?mc=EN_08_01

[20] The process of designation confers a legal status on a property by a specific law and provides a degree of legal protection (which varies by country). The term 'designation' is used when referring to the formal protection by legal statute for a wide range of heritage assets, including Listed Buildings and World Heritage Sites as well as many others.see more in http://en.wikipedia.org/wiki/Designation_(heritage_assets)

and secondary researches. At least three important issues are needed to be clarified before investigation of industrial architecture heritage: firstly what should be investigated? Secondly how much information is needed? Thirdly what surveys have been conducted in this area before?

Investigation subject choosing

The preliminary work is to determine the industrial architecture heritage needed to be surveyed. Currently there are two cases for the investigation: industrial architecture monomer and industrial area. In the first case, the investigation target is individual industrial building or construction. The first step is the roughly registration of the local industrial building with special importance in the local chronicles and the history of industry development, meanwhile according to recommendation of the general public, the preliminary list is obtained. Then study the existing data, according to the integrity and importance of the data, selecting the relatively excellent industrial buildings. The reduction process itself is equivalent to a preliminary assessment. Then detailed investigation is conducted for all selected industrial buildings. For those surroundings, the more useful information, the better is. Take Shanghai as an example, the choosing of industrial buildings in its protection list of *excellent historic building* is in this way. The second case, the investigation target is a specific area. Examples are the Shanghai Suzhou Creek alongside, Yangshupu riverside industrial building cluster district, and Beijing Shougang industrial district and so on. Then all kinds of immovable historic industrial remains in this area should be investigated. Besides, the systematic excavation as well as arrangement of and all kinds of movable industrial relics are necessary. They should be recorded with words, drawings, photos, videos and so on. The preliminary investigation which is in order to establish a complete industrial heritage file, is unnecessary to be too deep in every aspect of structure and equipment. The detailed investigation is conducted until the clear intention of reuse appears.

Investigation content

In the detailed investigation, each industrial building's history, status, condition, features and environment information should be gathered together as much as possible. A specially designed questionnaire should be prepared for the investigation. It main include name, place, possession, current usage and explanation for forms and styles, the historic condition of construction (architect and builder, date of construction, the homeowner, date of structure changing and so on), as well as the relevant historical figures and events of the building. Records of each fact should indicate the source and the name of investigator as well as the date.(Table 6-2)

It is necessary to have a deep understanding for the usages of the industrial buildings once had, which usually changed with time. Therefore, delivering record and assessment for each alteration were needed as far as possible, so that the integrity and authenticity can be guaranteed. It is better to obtain and keep more real information and records before production activities were shutting down. The integrated appearance features and conservation condition of the industrial buildings should be taken into record before any destruction. Meanwhile, the past surveys should be made most use of. In some cases, previous surveys have already existed. Regional and municipal planning departments, culture department, local history and social institutes or departments of architecture in local colleges, are likely to have conducted similar survey. These data should be consulted as much as possible in order to avoid repetitive work. With the

reference to the surveys above, establish complete industrial architecture heritage record files, as the basis of future protection and reuse.

investigation contents	
WRITTEN OR DRAWING SOURCES	The original designs of the building, including the architectural form, building style or type, etc.
	The original static system, the construction technology
	The architects who designed it
	The earlier use and the maintenance of the building
	The construction history (rebuilding, refurbishment)
	The historic significance, memories of the workers , special contributes to the town or state
SURVEY OF THE BUILDING	Documentation of the present floor-plan, sections and facades of the building
	Site and environment of the building
	Attachment buildings
BUILDING CONDITION ASSESSMENT	Structure – concrete, steel and wood components
	Building envelope – roof and sidewalls including windows and doors
	Interior finishes – floors, walls and ceilings
	Heating, ventilation and air conditioning
	Electrical system and components
	Plumbing system and fixtures
	Fire Suppression and life safety systems
	Landscaping including walks, drives, parking areas and planted areas

Table 6-2 Documentary and Field Study (Source: by author. According to Micheal Stratton, *Industrial Buildings: Conservation and Regeneration, Tourism* (London;New York: Taylor & Francis, 2000), p. 232.)

6.3.1.2 Assessment Work

The assessment for selected industrial architecture heritage through investigation is the most crucial step for register. The purpose of the assessment is to position and classify different categories, which allow the different levels of protection and reuse. To make the assessment simple and reasonable, it usually establish the evaluation criteria on the basis of full study of industrial heritage values. there are others values in addition to the value judgment for cultural relics--the history, science and art values. In the past few decades, environmental impact assessment has been gradually incorporated into the assessment process. The evaluation of sustainable development expands from ecosphere into a wider social environment. Therefore, it is necessary to formulate corresponding specific criteria according to the understanding of industrial heritage values. These criteria are also compatible with international standards on different types of industrial heritage.

The assessment work is commonly determined by the authoritative architects, the historians as well as the architectural experts who are familiar with local historical architecture. Meanwhile, it should be pointed out that, although the assessment is an objective appraisal for the comprehensive quality of industrial architecture heritage, it could not be completely impartial and objective. For the assessment work, although there are explicit grades or test scores, the results are close to the ideal objectivity. Therefore, the industrial architecture heritage which reach the register standard should be included in the “provisional list” and published. It is supposed to listen to the opinions of local government, the protection groups and the public extensively and seek the public's general acceptance.

6.3.1.3 Registration and the Controlling of Development Behavior

After the assessment and classification of industrial architecture heritage, the registration can be reached through corresponding programs. The related organizations of government control the right of registration to ensure the unification of the whole city or region. Then, the protection and management measures should be made for the registered industrial architecture heritage to prevent damage. All of the development behavior that is related to industrial architecture heritage, including reconstruction, extension, demolition, appearance modification, inside transformation, etc. must be permitted by special departments. Whether the development behavior is permitted is decided by the importance of registered industrial architecture heritage and the degree to be modification and transformation. In addition, the owner must maintain and repair the registered industrial architecture heritage to prevent damage and keep it well-being. However, when the registered industrial architecture heritage is in the state of repair, the local administrative department should send out “repair notifications” to the owner or the user.

6.3.2 Reuse Phase

According to the assessment of industrial architecture heritage, first we need to confirm

the scope and degree that it is allowed to change. Then we have the reuse feasibility study. In the end, the possible social benefit and economic benefit determine the reuse direction

6.3.2.1 Feasibility Study of Reuse

Feasibility study is directly related to the implementation of reuse project. The key of feasibility study is that whether the original building function and the new application can build a good matching relationship or not. Only when we fully inspect the component parts of the original buildings, explore the various potential possibilities of the space, then we can finally achieve the reasonable reuse of the original buildings. Reuse is different from a new project, and it is better to have the whole detailed drawing of the original building. However, many industrial buildings have long histories, and the data were not complete. Besides, the safekeeping is improper in some cases. Sometimes, we can only get the basic information through on-the-spot mapping of the object. The whole process of reuse needs deep investigation and verification repeated on the original buildings for many times. Finally, according to the present situation of the buildings and the development goals, we can make a preliminary reuse feasibility assessment.

Different from previous survey of the basic information, reuse feasibility investigation and assessment mainly check the factors influencing and determining the reuse. It includes related regulations, environment of the buildings, typology of the buildings, structure and conditions of the building, plan and configuration, materials and cladding.etc. (Table 6-3) A comprehensive understanding of site includes the land usage, road, traffic, municipal facilities, etc. The assessment of the soundness of the structure facilities mainly includes foundation, structural element, non structural element, roofs, floors, etc. Additionally, for those obsolete factors, which can reflect building functional features and time style, such as the original decorative materials, equipment and shape, color and other internal and external characteristics, we still need to analyze, and makes every effort to maintain them by any necessary technical means in order to increase the continuity of history. The assessment of use function includes three aspects: plane and space, physical function, and infrastructure.

On the whole, under the background of urban renewal, reuse of industrial architecture heritage not only needs to go deep into the monomer building itself, but also involves structure adjustment of urban structure, transformation of old cities, protection and renovation of historic blocks, and development of new city regions. therefore, when doing feasibility investigation on reuse program, we not only need to combine it with the construction status quo, but also need to consider the urban development, social structure, economic benefit, cultural characteristics and other important aspects.

ANALYSIS OF THE FACTORS INFLUENCING AND DETERMINING THE REUSE	
REGULATIONS	Town planning (regulations);
	Dimensioning (static), technical points;
	Fire prevention;
	Health;
	Building energetic points;
	Planning, functional.
ENVIRONMENT OF THE BUILDING	Location（the locations where historic industrial buildings are found, perceiving whether an area is still declining or not）
	Site（It is ideal if a building or a group of structures doesn't cover much of a site, offering better natural lighting, space for on-site access, and potential for expansion. There may be pressure to demolish some ancillary buildings on congested sites, but key ranges such as engine houses and gatehouses should be protected, and on historically significant sites, the coherency of the complex retained.）
TYPOLOGY OF BUILDING FORM	Multi-story mills and warehouses
	Daylight factories
	Single-story sheds
	Non buildings
STRUCTURE AND CONDITION OF THE BUILDING	Strength （Strength can be assessed by a structural engineer and several manuals on the appraisal of historic structures. There are some studies emphasize the extent to which the strength and consistency of steel and concrete in particular have advanced since their early usage.）
	The load carrying（It will be worth calculating the current, actual loads and then relating them to those associated with the proposed new use, especially if a significant increase in loading is anticipated）

	The structural/technical modifications	Reinforcement due to static reasons;		
		Partial demolition due to contamination, static or architectural reasons;		
		Rebuilding due to static, mechanical or architectural reasons;		
		Building in new constructions;		
		Compliance with various regulations;		
		Architectural or aesthetic interventions.		
PLAN AND CONFIGURATION	The floor-plan and story	Single-story ranges are ideal for industrial use or associated functions such as training workshops or storage.		
		Multi-story layouts are often desirable for office, craft and residential use		
		Large floor space is ideal for many conversion projects.		
	Ceiling heights			
	Internal partitions	Small single space	Single story	Character for specialized uses
		Large single space	Single story	Character for specialized uses
		Small repeated spaces	Multi-storied	Small units, poor access

		Large repeated spaces	Multi-storied	Flexibility , difficult to subdivide
MATERIALS AND CLADDING	Timber: readily adaptable but combustible and liable to wet and dry rot if buildings are derelict.			
	Cast-iron: high compressive strength and hence widely used for columns in the nineteenth century, incombustible, resistant to corrosion but brittle. May shatter in a fire.			
	Wrought iron: high tensile strength so used for beams in the nineteenth century.			
	Steel: strong in compression and tension and more ductile than cast-iron. Corrodes if not protected.			
	Reinforced concrete: strong but resistant to corrosion as long as reinforcement is not exposed. Difficult to cut through or adapt.			
LIGHTING	Shallow buildings are ideal for uses where occupiers are pre-occupied with individual tasks. Deeper buildings can facilitate greater interaction and may be essential to accommodate large machinery or other equipment. Some very deep buildings will need artificial lighting during daytime. Their cores may be best used for services such as kitchens or bathrooms or be given a central atrium, typically in the form of a stair well. While large windows are usually an asset, the curtain walls of twentieth-century factories can create major problems of solar gain, and threaten a lack of privacy for the occupants of newly-created apartments.			
ACCESS	Provision must be made for disabled access. Most factories will have Lifts but these may be antiquated and unsightly. It may be especially difficult to achieve access for wheelchairs to clusters of workshops with ranges set at different levels and narrow, stepped doorways.			

SERVICES	Services- heating, water supply, sanitation and lifts - will typically need to be replaced, though more of the character of an old building can be retained by refurbishing fittings wherever possible. Housing conversions usually necessitate the most intrusive changes, as all plumbing and electricity provision has to be duplicated. High standards of food hygiene will be needed for restaurants, and sophisticated systems of security and environmental control for museums.
FIRE SAFETY	Fire risks have to be taken into account when converting industrial buildings, especially if meeting halls or sleeping accommodation are being created.

Table 6-3 Analysis of the Factors Influencing and Determining the Reuse (Source: By author. Reference: Micheal Stratton, Industrial Buildings: Conservation and Regeneration, Tourism (London; New York: Taylor & Francis, 2000), p. 232)

6.3.2.2 REUSE ORIENTATION

This step is to transform the industrial architecture with new functions based on the value evaluation and the feasibility study before. The different types of modem industrial buildings are deserved varied treatment. According to the current situation, it can be simply divided into "good" and "ordinary" two categories, corresponding to be classified as cultural heritage industrial buildings and other industrial buildings. The former has a smaller number because it is rich and precious in its history value, art value and science value. So we need to study fully its original state, to restore the original state to the greatest extent and introduce new functionality appropriately. As cultural relics protection unit, the corresponding protection should be carried out according to the relevant laws and regulations. In reconstruction, it is the point that making efforts to maintain and restore the historical appearance to enhance the value of heritage. The common practice is to change the original function, but save the history in the space and landscape characteristics, which is a protective developing way for the original buildings.

As a result of the industrial heritage protection within the system of cultural heritage protection, for those listed as unmovable cultural relics of the industrial heritage, their use function of buildings can't change according to the requirements of the cultural relics protection, which also restricts the protection and reuse of industrial heritage to some extent. Therefore, the corresponding law for industrial architecture heritage needs to be formulated according to their characteristics. On this basis, we need further segment protection rules and categories and lower transforming restrictions of the protection level; at the same time we need to expand the list of industrial heritage to ensure that industrial heritage with historic value are on the protection list and they their protection category and reconstruction content are clear. When feasible, each protection design guideline should be made specifically and the complete industrial heritage management restriction mechanism should be built.

And for those “ordinary” industrial architecture heritage, although they are have no

special position in the development history of the industry, as a reflection of cities and industry development history, they need to return public life, which need more architects and planners by reuse to seek the recreation of the value. How to enhance the value, not just stay or restore the original value of it, are the questions which need thinking about for them. In China, now there exist quite a number of industrial buildings that is not very reasonable and good in terms of use and preservation conditions, which means they have to face a lot of challenges on the protection and reuse. However, this means that the diversification is also more likely to create.

6.3.2.3 Design Principles

Taking the Regulations of Shanghai Municipality on The Protection of The Areas with Historical Cultural Features and the Excellent Historical Buildings as reference, the reuse can be divided into the following four categories in a general way. In the reuse, according to the values of the building and its extent of good condition, these four methods could be applied.

(1) The elevation, structural system, plane layout and internal decoration of the building shall not be changed;

(2) The elevation, structural system, basic plane layout and internal decoration with characteristics of the building shall not be changed, but the other parts may be changed;

(3) The elevation and structural system of the building shall not be changed, but the internal parts of the building may be changed;

(4) The main elevation of the building shall not be changed, but the other parts may be changed.

Meanwhile, for the design principles of industrial architecture heritage, there are diverse design strategies and methods. However, the basic problem is to deal with new and old elements. We need to deal with relationship between the new and the old. It is very important to clearly define the scope that the building can be changed for the ways of change and elements of intervention can be varied. Only when we clearly know the scope of the old elements, can we clearly know the scope beyond that space that is provided for new functions to intervene.

The first part is to deal with the old elements. Generally speaking, the industrial building space is open, firm in structure, and strong in adaptability. When rebuilt, we need to make full use of the original structure. The appearance characteristic of buildings is one of the most direct proofs of the industrial building history and the aesthetic value. In the renovation, we should try our best to keep the original logical relationship of its facades. Of course, for the facades that have been damaged seriously, or for the industrial buildings that their history and aesthetic value are not high, we can only retain their skeleton. In some cases, we can give them new skin to adapt to the new functions. As for whether to quantify the ratio relationship between the old and the new or not, it depends on the value assessment result of the original industrial buildings.

The proceeding mode of the old elements can be summarized as “Plus & Minus” two kinds of methods. Subtraction is to subtract the corroded, the damaged, the maturing that cannot recover, harmful microorganisms, and pollution traces. Addition is to reinforce and repair the incomplete and the damaged through modern technology, in order to ensure the safety, and ensure that it can be continue used. Generally speaking,

the rebuilding will meet these two situations. The proceeding methods and technology of the old elements seem to be without a trace, but they are very important in the renewal. At present, a series of advanced protective technologies like Nondestructive Structure Detection Technology, Laser Cleaning Technology, Waterproof Enhancement Technology, Structure Reinforcement Technology, etc. have already been introduced into China, and they are all very important means to keep and reveal the original building features as much as possible.

The send part is to deal with the new elements. On the basis of keeping the authenticity of the original building and revealing the readability of history, new functions can be added in. Like many other types of historical buildings, due to the long-term of its building process, industrial buildings also can't be completely restored to the original state of the history. The historical imprints that record the specific eras need to be kept and shown in its original position through modern technique. Through comparison of the new and the old visually, the relevance of space, and material juxtaposition, we can reveal the readability of history. The methods of new elements intervention can be varied, but after all, the aim is to enhance the value of the original buildings rather than abandon its original morphological characteristics.

For the new building parts that have been added, the architect had better design and build under the principle of "reversible". In other words, if the new added parts are removed, the original buildings will not be badly damaged. Besides, there are some basic facilities, such as stairs, windows and toilets, need to be modified according to modern life in order to meet the requirements of new functions.

In summary, through the investigation, assessment, feasibility study and design control, the reuse of industrial architecture heritage can be guided with proper methodologies. Furthermore, whether the reuse has the effort on promoting the urban and regional development or not, it is not only the problem on the level of architectural design, but also urban planning administration policy that needs careful consideration. In fact the determinants of reuse transformation , not only lies in whether the reconstruction of the architecture is special or attractive, but more in the lands' costs and the whole regional planning and whether the new functions do good to the urban development in region. The reuse methodology should be considered with comprehensive perspectives.

Appendix

Appendix I

The Nizhny Tagil Charter for the Industrial Heritage

The International Committee for the Conservation of the Industrial Heritage (TICCIH)

17 July, 2003

TICCIH is the world organization representing industrial heritage and is special adviser to ICOMOS on industrial heritage. The text of this charter was passed by the assembled delegates at the triennial National Assembly of TICCIH held in Moscow on 17 July, 2003.

Preamble

The earliest periods of human history are defined by the archaeological evidence for fundamental changes in the ways in which people made objects, and the importance of conserving and studying the evidence of these changes is universally accepted.

From the Middle Ages, innovations in Europe in the use of energy and in trade and commerce led to a change towards the end of the 18th century just as profound as that between the Neolithic and Bronze Ages, with developments in the social, technical and economic circumstances of manufacturing sufficiently rapid and profound to be called a revolution. The Industrial Revolution was the beginning of a historical phenomenon that has affected an ever-greater part of the human population, as well as all the other forms of life on our planet, and that continues to the present day.

The material evidence of these profound changes is of universal human value, and the importance of the study and conservation of this evidence must be recognised.

The delegates assembled for the 2003 TICCIH Congress in Russia wish therefore to assert that the buildings and structures built for industrial activities, the processes and tools used within them and the towns and landscapes in which they are located, along with all their other tangible and intangible manifestations, are of fundamental importance. They should be studied, their history should be taught, their meaning and significance should be probed and made clear for everyone, and the most significant and characteristic examples should be identified, protected and maintained, in accordance with the spirit of the Venice Charter[1], for the use and benefit of today and of the future.

Definition of industrial heritage

Industrial heritage consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education.

1 The ICOMOS 'Venice Charter for the Conservation and Restoration of Monuments and Sites', 1964.

Industrial archaeology is an interdisciplinary method of studying all the evidence, material and immaterial, of documents, artefacts, stratigraphy and structures, human settlements and natural and urban landscapes[2], created for or by industrial processes. It makes use of those methods of investigation that are most suitable to increase understanding of the industrial past and present.

The *historical period* of principal interest extends forward from the beginning of the Industrial Revolution in the second half of the eighteenth century up to and including the present day, while also examining its earlier pre-industrial and proto-industrial roots. In addition it draws on the study of work and working techniques encompassed by the history of technology.

Values of industrial heritage

I. The industrial heritage is the evidence of activities which had and continue to have profound historical consequences. The motives for protecting the industrial heritage are based on the universal value of this evidence, rather than on the singularity of unique sites.

II. The industrial heritage is of social value as part of the record of the lives of ordinary men and women, and as such it provides an important sense of identity. It is of technological and scientific value in the history of manufacturing, engineering, construction, and it may have considerable aesthetic value for the quality of its architecture, design or planning.

III. These values are intrinsic to the site itself, its fabric, components, machinery and setting, in the industrial landscape, in written documentation, and also in the intangible records of industry contained in human memories and customs.

IV. Rarity, in terms of the survival of particular processes, site typologies or landscapes, adds particular value and should be carefully assessed. Early or pioneering examples are of especial value.

The importance of identification, recording and research

I. Every territory should identify, record and protect the industrial remains that it wants to preserve for future generations.

II. Surveys of areas and of different industrial typologies should identify the extent of the industrial heritage. Using this information, inventories should be created of all the sites that have been identified. They should be devised to be easily searchable and should be freely accessible to the public. Computerisation and on-line access are valuable objectives.

2 For convenience, 'sites' will be taken to mean landscapes, complexes, buildings, structures and machines unless these terms are used in a more specific way.

III. Recording is a fundamental part of the study of industrial heritage. A full record of the physical features and condition of a site should be made and placed in a public archive before any interventions are made. Much information can be gained if recording is carried out before a process or site has ceased operation. Records should include descriptions, drawings, photographs and video film of moving objects, with references to supporting documentation. Peoples' memories are a unique and irreplaceable resource which should also be recorded when they are available.

IV. Archaeological investigation of historic industrial sites is a fundamental technique for their study. It should be carried out to the same high standards as that of sites from other historical or cultural periods.

V. Programmes of historical research are needed to support policies for the protection of the industrial heritage. Because of the interdependency of many industrial activities, international studies can help identify sites and types of sites of world importance.

VI. The criteria for assessing industrial buildings should be defined and published so as to achieve general public acceptance of rational and consistent standards. On the basis of appropriate research, these criteria should be used to identify the most important surviving landscapes, settlements, sites, typologies, buildings, structures, machines and processes.

VII. Those sites and structures that are identified as important should be protected by legal measures that are sufficiently strong to ensure the conservation of their significance. The World Heritage List of UNESCO should give due recognition to the tremendous impact that industrialisation has had on human culture.

VIII. The value of significant sites should be defined and guidelines for future interventions established. Any legal, administrative and financial measures that are necessary to maintain their value should be put in place.

IX. Sites that are at risk should be identified so that appropriate measures can be taken to reduce that risk and facilitate suitable schemes for repairing or re-using them.

X. International co-operation is a particularly appropriate approach to the conservation of the industrial heritage through co-ordinated initiatives and sharing resources. Compatible criteria should be developed to compile international inventories and databases.

Legal protection

I. The industrial heritage should be seen as an integral part of the cultural heritage in general. Nevertheless, its legal protection should take into account the special nature of the industrial heritage. It should be capable of protecting plant and machinery, below-ground elements, standing structures, complexes and ensembles of buildings, and industrial landscapes. Areas of industrial waste should be considered for their potential archaeological as well as ecological value.

II. Programmes for the conservation of the industrial heritage should be

integrated into policies for economic development and into regional and national planning.

III. The most important sites should be fully protected and no interventions allowed that compromise their historical integrity or the authenticity of their fabric. Sympathetic adaptation and re-use may be an appropriate and a cost-effective way of ensuring the survival of industrial buildings, and should be encouraged by appropriate legal controls, technical advice, tax incentives and grants.

IV. Industrial communities which are threatened by rapid structural change should be supported by central and local government authorities. Potential threats to the industrial heritage from such changes should be anticipated and plans prepared to avoid the need for emergency actions.

V. Procedures should be established for responding quickly to the closure of important industrial sites to prevent the removal or destruction of significant elements. The competent authorities should have statutory powers to intervene when necessary to protect important threatened sites.

VI. Government should have specialist advisory bodies that can give independent advice on questions relating to the protection and conservation of industrial heritage, and their opinions should be sought on all important cases.

VII. Every effort should be made to ensure the consultation and participation of local communities in the protection and conservation of their local industrial heritage.

VIII. Associations and societies of volunteers have an important role in identifying sites, promoting public participation in industrial conservation and disseminating information and research, and as such are indispensable actors in the theatre of industrial heritage.

Maintenance and conservation

I. Conservation of the industrial heritage depends on preserving functional integrity, and interventions to an industrial site should therefore aim to maintain this as far as possible. The value and authenticity of an industrial site may be greatly reduced if machinery or components are removed, or if subsidiary elements which form part of a whole site are destroyed.

II. The conservation of industrial sites requires a thorough knowledge of the purpose or purposes to which they were put, and of the various industrial processes which may have taken place there. These may have changed over time, but all former uses should be examined and assessed.

III. Preservation *in situ* should always be given priority consideration. Dismantling and relocating a building or structure are only acceptable when the destruction of the site is required by overwhelming economic or social needs.

IV. The adaptation of an industrial site to a new use to ensure its conservation is usually acceptable except in the case of sites of especial historical significance.

New uses should respect the significant material and maintain original patterns of circulation and activity, and should be compatible as much as possible with the original or principal use. An area that interprets the former use is recommended.

V. Continuing to adapt and use industrial buildings avoids wasting energy and contributes to sustainable development. Industrial heritage can have an important role in the economic regeneration of decayed or declining areas. The continuity that re-use implies may provide psychological stability for communities facing the sudden end a long-standing sources of employment.

VI. Interventions should be reversible and have a minimal impact. Any unavoidable changes should be documented and significant elements that are removed should be recorded and stored safely. Many industrial processes confer a patina that is integral to the integrity and interest of the site.

VII. Reconstruction, or returning to a previous known state, should be considered an exceptional intervention and one which is only appropriate if it benefits the integrity of the whole site, or in the case of the destruction of a major site by violence.

VIII. The human skills involved in many old or obsolete industrial processes are a critically important resource whose loss may be irreplaceable. They need to be carefully recorded and transmitted to younger generations.

IX. Preservation of documentary records, company archives, building plans, as well as sample specimens of industrial products should be encouraged.

Education and training

I. Specialist professional training in the methodological, theoretical and historical aspects of industrial heritage should be taught at technical and university levels.

II. Specific educational material about the industrial past and its heritage should be produced by and for students at primary and secondary level.

Presentation and interpretation

I. Public interest and affection for the industrial heritage and appreciation of its values are the surest ways to conserve it. Public authorities should actively explain the meaning and value of industrial sites through publications, exhibitions, television, the Internet and other media, by providing sustainable access to important sites and by promoting tourism in industrial areas.

II. Specialist industrial and technical museums and conserved industrial sites are both important means of protecting and interpreting the industrial heritage.

III. Regional and international routes of industrial heritage can highlight the continual transfer of industrial technology and the large-scale movement of people that can be caused by it.

Eusebi Casanelles
President TICCIH

Eugene Logunov
TICCIH XII International Congress
Nizhny Tagil, 2003

Appendix II

Taipei Declaration for Asian Industrial Heritage

DECLARATION FOR ASIAN INDUSTRIAL HERITAGE

Preamble The Fifteenth TICCIH General Assembly was held in Taipei from November 5th to 8th, 2012. This is the first TICCIH General Assembly in Asia; the event signifies TICCIH's increasing attention to the Asian industrial heritage, which are now under increasing threat. After the four-day Assembly, the participants have reached a mutual agreement that adopting a declaration based on Asian industrial heritage to promote their conservation and preservation is appropriate and necessary.

I. The declaration acknowledges the existence and contributions of the World I Heritage Convention adopted by UNESCO, the Venice Charter adopted by the Second International Congress of Architects and Specialists of Historic Buildings, various charters and declarations adopted by ICOMOS, the Nizhny Tagil Charter for the Industrial I Heritage adopted by TICCII I, the Joint ICOMOS-TICCIH Principles for the Conservation of Industrial I Heritage, Sites, Structures, Areas and Landscapes as well as the Convention for the Safeguarding of the Intangible Cultural I Heritage adopted by UNESCO. Following their spirit and foundation, this declaration develops its contents.

II. We recognize that rapid changes in urban expansion, land exploitation, population growth, industrial structure, technology innovation and method of production leads to the vacancy and demolition of industrial heritage in urban and suburban areas. Therefore, starting appropriate conservation strategies at international, national and local levels is a must and a high priority task.

III. We recognize that industrial development in Asia is different from its counterparts in the West. The development of native manufacturing methods and facilities is part of the local history. The definition of industrial heritage in Asia should be broadened to include technologies, machinery and producing facilities, built structures and built environment of pre-industrial revolution and post-industrial revolution periods.

IV. We recognize that industrial heritage in Asia, witnessing the process of the modernization, contributes to the identity of regions and countries, and forms an integral part of the history.Furthermore, the achievement of industrialization in Asia is always achieved with the help of hard-working local people. Industrial heritage is closely associated with the life history, memories, and stories of local people and social changes.

V. We recognize that industrial heritage in Asia is deeply related to the natural resources, land development and vernacular economy. Industrial heritage in Asia is always part of a comprehensive cultural landscape, either in urban or in rural settings. In addition to the built environment, it strongly reflects the interaction of humans and the land, featuring the characteristics of hetero-topography.

VI. We recognize that many key elements of industrial heritage in Asia were imported by colonizers or countries in the Western World, that the factories and facilities are pioneering avant-garde, incorporating aesthetic and scientific values that reflect the history of architecture, construction techniques and equipment which should be preserved in ways that reflect their integrity. Workers housing, sources of materials and transportation facilities are all contributing parts of this integrity and should also be considered for preservation.

VII. We recognize that industrial heritage in Asia includes the operations of the machinery and the necessary technical know-how, often embodied in local residents as technicians. While preserving the industrial heritage, the operational technology and associated archives and documents should also be conserved. The intangible heritage associated with industrial heritage and local people should also be treated as parts of an integrated complex.

VIII. We recognize that in order to ensure sustainable development of the industrial heritage in Asia, the strategies and methods for conservation must be flexible. Except for the structures and sites of exceptional architectural and artistic values for which intervention is undesirable, adaptive reuse of the industrial heritage for a new function to safeguard their conservation is accepted.

IX. We recognize that flexibility can be applied to the conservation of industrial heritage in Asia. However, the adaptive reuse for a new function should not be achieved at the sacrifice of the universal value and core value of the industrial heritage.

X. We recognize that industrial heritage in Asia is strongly related to local people. Therefore, the participation and engagement of the local people should be encouraged in the conservation of every industrial heritage site.

XI. We recognize that both national and trans-national industrial heritage are equally important and the need of the future cooperation between Asian countries to promote the conservation of them is crucial. Therefore, the participants of the 15th TICCIH Congress agree that it is necessary to establish an Asian network for industrial heritage within the framework of TICCIH

Appendix III

Main International and National Industrial Heritage Societies

Name of the industrial heritage societies	**Country**
TICCIH (The International Committee for the Conservation of the Industrial Heritage)	International Organization
TICCIH, founded after the First International Conference for the Conservation of the Industrial Heritage in Ironbridge, England, in 1973, is a world organization for industrial heritage, promoting preservation, conservation, investigation, documentation, research and interpretation of our industrial heritage. This wide field includes the material remains of industry - industrial sites, buildings and architecture, plant, machinery and equipment - as well as housing, industrial settlements, industrial landscapes, products and processes, and documentation of the industrial society. It is organized through a Board and President who are chosen by the National Representatives of the various national committees or associated societies. Members of TICCIH come from all over the world and include historians, conservators, museum curators, researchers, students, teachers, heritage professionals and anyone with an interest in the development of industry and industrial society. ***http://www.ticcih.org/***	
AIA (Association for Industrial Archaeology)	United Kingdom
The AIA is the national organization for people who share an interest in Britain's industrial past. It brings together people who are researching, recording, preserving and presenting the great variety of this country's industrial heritage. Industrial architecture, mineral extraction, heritage-based tourism, power technology, adaptive re-use of industrial buildings and transport history are just some of the themes being investigated by our members. Every year the Association monitors over 200 hundred applications to alter or demolish industrial sites and buildings. We work with other amenity groups to protect Britain's heritage and represent Britain on the International Committee for the Conservation of the Industrial Heritage. ***http://industrial-archaeology.org/***	

AIPAI(Associazione italiana per il Patrimonio Archeologico Industriale)	Italy

As the only national association in this sector, AIPAI was founded in 1997 .The Association signed a protocol agreement in 2008 with TICCIH, recognizing AIPAI as TICCIH's sole representative in Italy. AIPAI, which has several regional sections and national commissions in the sector, today boasts more than 300 active members, and successfully interacts with universities and other public and private bodies.

AIPAI has undertaken a great many initiatives aimed at raising awareness among the public at large of our Industrial Heritage. One of the initiatives which have stimulated the most signs of interest is the organization, each year, of specific days aimed at directing the public's attention to particular categories of industrial sites by means of events which usually meet with great success in terms of public participation.

The "National Mines Day" (the last Saturday in May), organized in collaboration with ISPRA (Higher Institute for the Environmental Protection and Research, Environment Ministry). Held for the first time in 2009, it is now in its fourth year (2012), and a growing number of mining parks and museums subscribe to the event, marking the day by promoting individual initiatives aimed at spreading an awareness of the value and cultural meaning of geological and mining tourism; and The "National Day of Forgotten Railways" (in March), organized by the Confederazione per la Mobilita Dolce, a confederation of several outdoor associations of which AIPAI is an active member, and which is now in its fifth year (2012).

The catalogue of the exhibition compiled by AlPAI's regional sections on the occasion of TICCIH's 13th International Congress (2006) in Terni, Routes of industrial heritage in Italy (R. Parisi, M. Ramello eds.), to which all AlPAI's members contributed in identifying and selecting the most typical elements of Italy's industrial heritage;

http://www.patrimonioindustriale.it/

CILAC(Comité d'information et de liaison pour l'archéologie, l'étude et la mise en valeur du patrimoine industriel)	France

CILAC is a French non-profitorganisation. Its aims are to assist the work of associations, learned societies and museums interested in the conservation and protection of the world's industrial heritage and to act as a lobby group in respect of issues that are important to its members.

The association's members are all volunteers, e, published issues of its review L'Archeologie industrielle en France Plan Nacional de Patrimonio Industrial de

Esparia (the National Industrial Heritage Plan of Spain or PNPI) ***http://www.cilac.com/***
SIA (Society for Industrial Archeology) — USA
SIA is a North American non-profit organization dedicated to encourage the study, interpretation, and preservation of historically significant industrial sites, structures, artifacts, and technology. By providing a forum for the discussion and exchange of information, the Society advances an awareness and appreciation of the value of preserving our industrial heritage. It was founded in 1971 in Washington, D.C., and its members are primarily from the United States and Canada, although there is some crossover with similar organizations in the United Kingdom. SIA produces two official publications, the formal, peer-reviewed IA: Journal of the Society for Industrial Archeology twice a year and the less formal quarterly Society for Industrial Archeology Newsletter (SIAN). The annual conference is typically accompanied by a custom guidebook profiling local industrial and cultural sites. In addition, SIA produces occasional publications on special topics. ***http://www.sia-web.org/***

Appendix IV

Law of the People's Republic of China on Protection of Cultural Relics

Law of the People's Republic of China on Protection of Cultural Relics

(Adopted at the 25th Meeting of the Standing Committee of the Fifth National Peoples Congress on November 19,1982,revised in accordance with the Decision of the Standing Committee of the National Peoples Congress Regarding the Revision of Article 30 and Article 31 of the Law of the Peoples Republic of China on Protection of Cultural Relics at the 20th Meeting of the Standing Committee of the Seventh National Peoples Congress on June 29,1991, and revised again at the 30th Meeting of the Standing Committee of the Ninth National Peoples Congress on October 28,2002)

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Chapter I

General Provisions

Article 1 This Law is enacted in accordance with the Constitution, with a view to strengthening the protection of cultural relics, inheriting the splendid historical and cultural legacy of the Chinese nation,promoting scientific research,conducting education in patriotism and in the revolutionary tradition, and building a socialist society with cultural, ideological and material progress.

Article 2 The State places under its protection the following cultural relics within the boundaries of the Peoples Republic of China:

(1)sites of ancient culture, ancient tombs, ancient architectural structures, cave temples, stone carvings and murals that are of historical, artistic or scientific value;

(2)important modern and contemporary historic sites, material objects and typical buildings that are related to major historical events, revolutionary movements or famous personalities and that are highly memorable or are of great significance for education or for the preservation of historical data;

(3)valuable works of art and handicraft articles dating from various historical periods;

(4)important documents dating from various historical periods, and manuscripts, books and materials, etc.that are of historical, artistic or scientific value; and

(5)typical material objects reflecting the social system, social production or the life of various nationalities in different historical periods.

The criteria and measures for the verification of cultural relics shall be formulated by the administrative department for cultural relics under the State Council and submitted to the State Council for approval.

Fossils of paleovertebrates and paleoanthropoids of scientific value shall be protected by the State in the same way as cultural relics.

Article 3 Immovable cultural relics, such as sites of ancient culture, ancient tombs,ancient architectural structures, cave temples, stone carvings and murals as well as important modern and contemporary historic sites and typical buildings, may, depending on their historical, artistic and scientific value, be designated respectively as major sites to be protected for their historical and cultural value at the national level, sites to be protected for their historical and cultural value at the provincial level, and sites to be protected for their historical and cultural value at the city or county level.

Movable cultural relics, such as important material objects, works of art, documents, manuscripts, books, materials, and typical material objects dating from various historical periods, shall be divided into valuable cultural relics and ordinary cultural relics; and the valuable cultural relics shall be subdivided into grade-one cultural relics, grade-two cultural relics and grade-three cultural relics.

Article 4 In the work concerning cultural relics,the principle of giving priority to the protection of cultural relics, attaching primary importance to their rescue, making rational use of them and tightening control over them shall be carried out.

Article 5 All cultural relics remaining underground or in the inland waters or territorial seas within the boundaries of the Peoples Republic of China are owned by the State.

Sites of ancient culture, ancient tombs and cave temples are owned by the State. Such immovable cultural relics as memorial buildings, ancient architectural structures, stone carvings, murals and typical architectural structures of the modern and contemporary times, designated for protection by the State, except where otherwise provided for by regulations of the State, are owned by the State.

The ownership of State-owned immovable cultural relics shall remain unchanged when ownership or the right to use of the land to which such relics are attached changes.

The following movable, cultural relics are owned by the State:

(1)cultural relics unearthed within the territories of the Peoples Republic of China, except where otherwise provided for by regulations of the State;

(2)cultural relics collected and preserved by institutions for the collection of State-owned cultural relics and by other State organs, armed forces, State-owned enterprises,public institutions, etc.;

(3)cultural relics collected and purchased by the State;

(4)cultural relics donated to the State by citizens, legal persons and other organizations; and

(5)other cultural relics owned by the State as provided for by laws.

Ownership of movable cultural relics owned by the State shall remain unchanged when institutions for their preservation or collection cease to exist or are replaced.

Ownership of the State-owned cultural relics shall be protected by laws and shall brook no infringement.

Article 6 Ownership of memorial buildings, ancient architectural structures, cultural relics handed down from ancestors and other cultural relics obtained in accordance with laws, which belong to collectives or individuals, shall be protected by laws. Owners of the cultural relics shall abide by State laws and regulations on the protection of cultural relics.

Article 7 All government department, public organizations and individuals shall have the obligation to protect the cultural relics in accordance with laws.

Article 8 The administrative department for cultural relics under the State Council shall take charge of the work concerning the protection of cultural relics throughout the country.

Local peoples governments at various levels shall take charge of the work concerning the protection of cultural relics within their own administrative areas. Departments in charge of the work concerning the protection of cultural relics under local peoples governments at or above the county level shall exercise supervision and control over the protection of cultural relics within their own administrative areas.

The relevant administrative departments under peoples governments at or above the county level shall, within the scope of their own functions and duties, take charge of the work concerning the protection of cultural relics.

Article 9 Peoples governments at various levels shall attach importance to the protection of cultural relics and correctly handle the relations between economic and social development and the protection of cultural relics so as to ensure safety of the cultural relics.

Capital construction and the development of tourism shall be governed by the principle for the work concerning the protection of cultural relics, and such activities may not cause damage to cultural relics.

Public security organs, administrative departments for industry and commerce, the Customs, departments for urban and rural construction planning and the relevant State organs shall, in accordance with law, conscientiously perform their functions and duties for the protection of cultural relics and maintain the order of the control over cultural relics.

Article 10 The State develops the undertaking of the protection of cultural relics. Peoples governments at or above the county level shall incorporate the undertaking of the protection of cultural relics into their own plans for national economic and social development and the expenses entailed shall be listed in their own budgets.

Budgetary appropriations made by the State for the protection of cultural relics shall increase along with the increase of revenues.

Incomes earned by the undertakings of the State-owned museums, memorial halls, sites protected for their historical and cultural values, etc. shall exclusively be used for the protection of cultural relics, and no units or individuals may take them into their own possession or misappropriate them.

The State encourages, through such forms as donations, the establishment of social funds for the protection of cultural relics, which shall exclusively be used for the protection of cultural relics. No units or individuals may take such funds into their own possession or misappropriate them.

Article 11 Cultural relics are unrenewable cultural resources. The State devotes great efforts to the publicity and education in the need to protect cultural relics, enhances the awareness of the entire people of the need, and encourages scientific research in this field in order to raise the scientific and technological level for the protection of the cultural relics.

Article 12 The State gives moral encouragement or material rewards to units and individuals for any of the following deeds:

(1)conscientiously implementing laws and regulations on the protection of cultural relics and making remarkable achievements in protecting cultural relics;

(2)resolutely fighting against criminal acts, in the interest of protecting cultural relics;

(3)donating important cultural relics in one s own collection to the State or making donations for the undertaking of protection of cultural relics;

(4)immediately reporting or delivering to the authority when discovering cultural relics, which facilitates their protection;

(5)making major contributions to the work of archaeological excavations;

(6)making important inventions and innovations in the science and techniques for the protection of cultural relics, or other important contributions in this respect;

(7)rendering meritorious service in rescuing cultural relics that are in danger of being destroyed; and

(8)having been engaged in the work concerning cultural relics over long years and having made outstanding achievements in this field.

Chapter II

Immovable Cultural Relics

Article 13 The administrative department for cultural relics under the State Council shall select sites from among the ones protected for their significant historical, artistic or scientific value at the provincial, city or county level and designate them as major sites to be protected for their historical and cultural value at the national level, or shall directly designate such major sites, and report them to the State Council for verification and announcement.

Sites to be protected for their historical and cultural value at the provincial level shall be verified and announced by the peoples governments of provinces, autonomous regions, or municipalities directly under the Central Government, and be reported to the State Council for the record.

Sites to be protected for their historical and cultural value at the city or county level shall be verified and announced respectively by the peoples governments of cities divided into districts, of autonomous prefectures and of counties, and be reported to the peoples governments of provinces, autonomous regions, or municipalities directly under the Central Government for the record.

Immovable cultural relics of sites to be protected for their historical and cultural value that have not yet been verified and announced as such shall be registered and announced by the administrative department for cultural relics under the peoples government at the county level.

Article 14 Cities with an unusual wealth of cultural relics of important historical value or high revolutionary memorial significance shall be verified and announced by the State Council as famous cities of historical and cultural value.

Towns, neighborhoods or villages with an unusual wealth of cultural relics of important historical value or high revolutionary memorial significance shall be verified and announced by the peoples governments of provinces, autonomous regions, or municipalities directly under the Central Government as famous neighborhood, villages or towns of historical and cultural value, and reported to the State Council for the record.

Local peoples governments at or above the county level in places where famous cities of historical and cultural value, or famous neighborhoods, villages or towns of historical and cultural value are located shall take charge of drawing up special plans for their protection and include such plans in their overall urban plans.

Measures for the protection of famous cities, famous neighborhoods, villages and towns of historical and cultural value shall be formulated by the State Council.

Article 15 Peoples governments of provinces, autonomous regions, and municipalities directly under the Central Government and of cities and counties shall respectively delimit the necessary area of protection, put up signs and notices, and establish records and files for the historical and cultural sites protected at the corresponding levels and shall, in the light of different circumstances, establish special organs or assign fulltime persons to be responsible for control over these sites. The area of protection and records and files for the major historical and cultural sites protected at the national level shall be reported by the administrative department for cultural relics

under the peoples governments of provinces, autonomous regions, or municipalities directly under the Central Government to the administrative department for cultural relics under the State Council for the record.

The administrative departments for cultural relics under the local peoples governments at or above the county level shall, on the basis of the requirements for the protection of different cultural relics, formulate specific protective measures for the immovable cultural relics of the sites protected for their historical and cultural value and of the sites that have not yet been verified as such, and announce the measures for implementation.

Article 16 When drawing up plans for urban and rural construction, the peoples governments at various levels shall, on the basis of the requirements for the protection of cultural relics, see to it that protective measures for the historical and cultural sites protected at different levels within their own administrative areas are first formulated through consultation between the departments for urban and rural construction planning and the administrative departments for cultural relics and include such measures in their plans.

Article 17 No construction of additional projects or such operations as blasting, drilling and digging may be conducted within the area of protection for a historical and cultural site. However, where under special circumstances it is necessary to conduct construction of additional projects or such operations as blasting, drilling and digging within the area of protection for such a site, its safety shall be guaranteed, and the matter shall be subject to approval by the peoples government which originally verified and announced the site and which, before giving approval, shall ask consent of the administrative department for cultural relics under the peoples government at the next higher level; and where construction of additional projects or such operations as blasting, drilling and digging are to be conducted within the area of protection for a major historical and cultural site protected at the national level, the matter shall be subject to approval by the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government, which, before giving approval, shall ask consent of the administrative department for cultural relics under the State Council.

Article 18 On the basis of the actual needs for the protection of cultural relics and with the approval of the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government, a certain area for control of construction may be delimited around a site protected for its historical and cultural value, and such an area shall be announced.

No construction of a project conducted in an area for control of construction may deform the historical features of the site protected for its historical and cultural value; and the design for the project shall, in correspondence with the protection level of the site protected for its historical and cultural value, be subject to consent by the appropriate administrative department for cultural relics before it is submitted to the department for urban and rural construction planning for approval.

Article 19 No facilities that pollute the sites protected for their historical and cultural value or their environment may be put up within the area of protection for these sites or the area for control of construction, and no activities that may adversely affect

the safety and environment of these sites may be conducted. Where there are already facilities that pollute the sites and their environment, they shall be brought under control within a specified time limit.

Article 20 While choosing a place for a construction project, the construction unit shall try its best to get around the site of immovable cultural relics; where it is impossible to do so under special circumstances, it shall do everything it can to protect the original site protected for its historical and cultural value.

Where the original site is to be protected, the construction unit shall first work out protective measures and, in correspondence with the level of protection for the site, submit the measures to the appropriate administrative department for cultural relics for approval, and include the measures in its feasibility study report or in the design, in which the task of protection is specified.

Where it is impossible to protect the original site or the site needs to be moved to another place or dismantled, the matter shall be reported to the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government for approval; where a site protected for its historical and cultural value at the provincial level needs to be moved to another place or dismantled, consent of the administrative department for cultural relics under the State Council shall be obtained prior to approval. No major historical and cultural sites protected at the national level may be dismantled; where such a site needs to be moved to another place, the matter shall be reported by the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government to the State Council for approval.

Among the State-owned immovable cultural relies to be dismantled in accordance with the provisions of the preceding paragraph, the murals, carvings, building components, etc. which are worthy of collecting shall be collected by the institution for the collection of cultural relics designated by the administrative department for cultural relics.

The expenses required for protecting, moving to another place or dismantling an original site as provided for by this Article shall be included in the budget of the construction unit for the construction project.

Article 21 Users of State-owned immovable cultural relics shall be responsible for their repairs and maintenance; and the owners of the immovable cultural relics not owned by the State shall be responsible for their repairs and maintenance. Where the immovable cultural relics not owned by the State are in danger of damage and the owner cannot afford their repairs, the local peoples government shall offer the owner assistance; and where the owner can afford their repairs but refuses to perform his obligation to repair them as required by law, the peoples government at or above the county level may make emergency repairs and the expenses entailed shall be borne by the owner.

Repairs to be made for sites protected for their historical and cultural value shall, in correspondence with their different levels of protection, be subject to approval by the appropriate administrative department for cultural relics; and repairs to be made for the immovable cultural relics of the sites that are not yet verified as ones protected for their historical and cultural value shall be subject to approval by the administrative

departments for cultural relics under the peoples governments at the county level with which the sites are registered.

The repairs, removal, or reconstruction of a site protected for its historical and cultural value shall be undertaken by the unit that has obtained the qualification certificate for projects designed to protect cultural relics.

In the repairing, maintaining and removing immovable cultural relics, the principle of keeping the cultural relics in their original state shall be adhered to.

Article 22 Where immovable cultural relics are totally damaged, the ruins shall be protected and the damaged relics may not be rebuilt on the original site. However, where under special circumstances it is necessary to have such relics rebuilt on the original site, the administrative department for cultural relics under the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government shall ask consent of the administrative department for cultural relics under the State Council before submitting the matter to the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government for approval; and where major site protected for its historical and cultural value at the national level needs to be rebuilt on the original site, the matter shall be submitted by the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government to the State Council for approval.

Article 23 Where it is necessary to use a memorial building or an ancient architectural structure owned by the State at a place verified as a site protected for its historical and cultural value for purposes other than the establishment of a museum, a cultural relics preservation institute or a tourist site, the administrative department for cultural relics under the peoples government that originally verified and announced it as such a site shall first ask consent of the administrative department for cultural relics at the next higher level and then submit a report to the said peoples government for approval; and where a major site protected for its historical and cultural value at the national level is to be used for other purposes, the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government shall submit a report to the State Council for approval. Where the State-owned immovable cultural relics of a site not verified as one protected for its historical and cultural value are to be used for other purposes, the matter shall be reported to the administrative department for cultural relics under the peoples government at the county level.

Article 24 No immovable cultural relics owned by the State may be transferred or mortgaged. No State-owned sites protected for their historical and cultural value, which are established as museums or cultural relics preservation institutes or used as tourist sites may be made enterprise assets for business operation.

Article 25 No immovable cultural relics not owned by the State may be transferred or mortgaged to foreigners.

The transfer and mortgage of the immovable cultural relics not owned by the State, or the change in their use shall, in correspondence with their different grades, be reported to the appropriate administrative departments for cultural relics for the record; and where their repairs are to be financed by the local peoples government, the matter

shall be submitted to the appropriate administrative departments for cultural relics for approval.

Article 26 The principle of keeping the immovable cultural relics in their original state shall be adhered to in their use, and the users shall be responsible for the safety of the structures and the cultural relics attached to them, see to it that the immovable cultural relics are not damaged, rebuilt or dismantled and that no additional structures are built on the site.

With regard to the buildings or structures that threaten the safety of the sites protected for their historical and cultural value or damage their historical features, the local peoples government shall, without delay, investigate and handle the matter, and when necessary, it may have such buildings or structures dismantled or moved to other places.

Chapter III

Archaeological Excavations

Article 27 The procedure of submitting reports for approval shall be performed for all archaeological excavations; all institutions engaged in archaeological excavations shall be subject to approval by the administrative department for cultural relics under the State Council.

No units or individuals may, without permission, conduct excavation of the cultural relics buried underground.

Article 28 The institutions engaged in archaeological excavations that need to conduct archaeological excavations for the purpose of scientific research shall submit their excavation plans to the administrative department for cultural relics under the State Council for approval; plans for archaeological excavations relating to the major sites protected for their historical and cultural value at the national level shall be submitted to the administrative department for cultural relics under the State Council for examination and verification before they are forwarded to the State Council for approval. Before giving approval to or examining and verifying such plans, the administrative department for cultural relics under the State Council shall consult with the research institutes of social sciences, other scientific research institutes and the experts concerned.

Article 29 Before launching a large-scale capital construction project, the construction unit shall first request in a report the administrative department for cultural relics under the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government to make arrangements for institutions engaged in archaeological excavations to conduct archaeological investigation and prospecting at places where cultural relics may be buried underground within the area designated for the project.

Where cultural relics are discovered in the course of investigation and prospecting, the administrative department for cultural relics under the peoples government of the

relevant province, autonomous region, or municipality directly under the Central Government shall, in compliance with the requirements for protection of cultural relics, decide on the protective measures through consultations with the construction unit. In case of important discoveries, the administrative department for cultural relics under the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government shall immediately submit a report to the administrative department for cultural relics under the State Council for handling.

Article 30 With regard to archaeological excavations which have to be carried out along with a construction project, the administrative department for cultural relics under the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government shall submit an excavation plan based on the result of prospecting to the administrative department for cultural relics under the State Council for approval. Before giving approval to the plan, the administrative department for cultural relics under the State Council shall consult with research institutes of social sciences, other scientific research institutes and the experts concerned.

In cases where the pressing time limit for the completion of the project or the danger of natural damage makes it truly urgent to rescue and excavate the sites of ancient culture or ancient tombs, the administrative department for cultural relics under the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government may make arrangements for proceeding with the excavation, while going through the formalities of examination and approval.

Article 31 The expenses needed for archaeological investigation, prospecting, or excavation, which have to be carried out because of capital construction or construction for productive purposes, shall be included in the budget of the construction unit for the construction project.

Article 32 In the course of construction of a project or agricultural production, all units and individuals that discover cultural relics shall keep the scene intact and immediately report to the local administrative department for cultural relics; after receiving the report, the department shall, except under special circumstances, rush to the scene within 24 hours and put forth its proposals on the handling of the matter within seven days. The administrative department for cultural relics may report to the local peoples government; requesting it to inform the public security organ of the matter and to seek its assistance in keeping the scene intact; and where important cultural relics are discovered, the matter shall immediately be reported to the administrative department for cultural relics under the State Council, which shall put forth its proposal on the handling of the matter within 15 days after receiving the report.

The cultural relics discovered in such a manner as mentioned in the preceding paragraph belong to the State, and no unit or individual may plunder, privately divide or conceal them.

Article 33 Without submitting a report to the administrative department for cultural relics under the State Council for special permission by the State Council, no foreigner or foreign organization may conduct archaeological investigation, prospecting or excavation within the boundaries of the Peoples Republic of China.

Article 34 The results of archaeological investigation, pros pecting and excavation shall be reported to the administrative department for cultural relics under the State Council and to the administrative department for cultural relics under the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government.

Excavated archaeological relics shall be registered,preserved properly and, in accordance with the relevant regulations of the State, turned over for collection to the administrative department for cultural relics under the peoples government of the relevant province, autonomous region, or municipality directly under the Central Government or to the State-owned museums, libraries or other State-owned institutions for the collection of cultural relics designated by the administrative department for cultural relics under the State Council. Upon approval by the administrative department for cultural relics under the peoples government of the relevant province, autonomous region or municipality directly under the Central Government, or under the State Council, institutions engaged in archaeological excavation may retain a small amount of unearthed cultural relics as samples for scientific research.

No units or individuals may take excavated archaeological relics into their own possession.

Article 35 To meet the need of ensuring the safety of cultural relics, conducting scientific research and making full use of cultural relics, the administrative department for cultural relics under the peoples government of the relevant province, autonomous region or municipality directly under the Central Government may, upon approval by the peoples government at the corresponding level, transfer and use the cultural relics unearthed within their own administrative areas; and the administrative department for cultural relics under the State Council may, upon approval by the State Council, transfer major cultural relics unearthed anywhere in the country.

Chapter IV

Cultural Relics in the Collection of Cultural Institutions

Article 36 Museums, libraries and other institutions for the collection of cultural relics shall classify the cultural relics in their collection into different grades, compile files for the relics kept by them, establish a strict system of control, and submit them to the competent administrative department for cultural relics for the record.

The administrative department for cultural relics under the peoples governments at or above the county level shall compile files for the cultural relics in the collection of cultural institutions in their own administrative areas; and the administrative department for cultural relics under the State Council shall compile files for grade-one cultural relics of the State and for the cultural relics in the collection of State-owned cultural institutions under its charge.

Article 37 Institutions for the collection of cultural relics may obtain cultural relics by the following means:

(1)purchasing;

(2)accepting donations;

(3)exchanging according to law; or

(4)other means as provided for by laws and administrative rules and regulations.

Institutions for the collection of State-owned cultural relics may also obtain cultural relics through designation by the administrative department for cultural relics for preserving the relics or through transfer by the department.

Article 38 Institutions for the collection of cultural relics shall, in light of the need for protection of cultural relics in their collection and in accordance with the relevant regulations of the State, establish a sound system of control and report it to the competent administrative department for cultural relics for the record. Without approval, no unit or individual may, through transfer, obtain cultural relics in the collection of cultural institutions.

Legal representatives of the institutions for the collection of cultural relics shall be responsible for the safety of the cultural relics in their collection. Before leaving their posts, the legal representatives of the institutions for the collection of State-owned cultural relics shall, on the basis of the files of the cultural relics in the collection of the cultural institutions, go through the formalities of handing over the cultural relics in the collection of the institutions.

Article 39 The administrative department for cultural relics under the State Council may transfer the cultural relics in the collection of the State-owned cultural institutions anywhere in the country. The administrative department for cultural relics under the peoples government of the relevant province, autonomous region or municipality directly under the Central Government may transfer the cultural relics in the collection of the State-owned cultural institutions, which are under its charge and are located in its administrative area; and where grade-one cultural relics in the collection of State-owned cultural institutions are transferred, the matter shall be reported to the administrative department for cultural relics under the State Council for the record.

State-owned institutions for the collection of cultural relics may apply for transfer of the cultural relics in the collection of State-owned cultural institutions.

Article 40 Institutions for the collection of cultural relics shall give full play to the cultural relics in their collection and, through holding exhibitions, conducting scientific research, etc., help enhance publicity and education in the splendid history and culture and the revolutionary tradition of the Chinese nation.

Where State-owned cultural institutions for the collection of cultural relics, for purposes of holding exhibitions, conducting scientific research, etc., need to borrow from each other cultural relics in their collection, the matter shall be reported to the competent administrative department for cultural relics for the record; and where grade-one cultural relics in the collection of cultural institutions are to be borrowed, the

matter shall be subject to approval by the administrative department for cultural relics under the State Council.

Where institutions for the collection of cultural relics not owned by the State and other institutions, for purposes of holding exhibitions, need to borrow cultural relics in the collection of the State-owned cultural institutions, the matter shall be subject to approval by the competent administrative department for cultural relics; and where grade-one cultural relics in the collection of State-owned cultural institutions are to be borrowed, the matter shall be subject to approval by the administrative department for cultural relics under the State Council.

The maximum period of time for the borrowing of cultural relics between the institutions for the collection of cultural relics may not exceed three years.

Article 41 Cultural relics in institutions for the collection of State-owned cultural relics that have compiled files of the cultural relics in their collection may be exchanged among such institutions upon approval by the administrative department for cultural relics under the peoples government of the relevant province, autonomous region or municipality directly under the Central Government, and the matter shall be reported to the administrative department for cultural relics under the State Council for the record; and where grade-one cultural relics in their collection are to be exchanged, the matter shall be subject to approval by the administrative department for cultural relics under the State Council.

Article 42 No institutions for the collection of State-owned cultural relics that have not compiled files of the cultural relics in their collection may handle the cultural relics in their collection in accordance with the provisions in Articles 40 and 41 of this Law.

Article 43 The institution for the collection of the cultural relics that obtains cultural relics through lawful transfer, exchange or borrowing of the cultural relies in the collection of State-owned cultural institutions may give a reasonable sum of compensation to the institution for the collection of cultural relics that provides it with the cultural relics. The specific administrative measures in this respect shall be formulated by the administrative department for cultural relics under the State Council.

The amount of compensation gained by the institutions for the collection of State-owned cultural relics from the transfer, exchange or lending of cultural relics shall be used for the improvement of the conditions for the collection of cultural relics or for the collection of new cultural relics, but not for other purposes; and no unit or individual may take it into its/his own possession.

The cultural relics transferred, exchanged or borrowed shall be kept in good care, and none of then may be lost or damaged.

Article 44 No institutions for the collection of State-owned cultural relics may donate, lease or sell the cultural relics in their collection to other units or individuals.

Article 45 Measures for disposition of the cultural relics which institutions for the collection of the State-owned cultural relics no longer keep shall be formulated separately by the State Council.

Article 46 No repairs of cultural relics in the collection of cultural institutions may change their original state; and when duplicating, taking photos or making rubbings of cultural relics in the collection of cultural institutions, one shall take care not to damage the cultural relics. Specific administrative measures in this respect shall be formulated by the State Council.

The provisions of the preceding paragraph shall be applicable to repairs, duplication, photo-taking and rubbing of all-in-one cultural relics of immovable cultural relics.

Article 47 Museums, libraries and other institutions for the collection of cultural relics shall, in accordance with the relevant regulations of the State, be installed with facilities against fire, robbery and natural damages so as to ensure safety of the cultural relics in their collection.

Article 48 Where grade-one cultural relics in the collection of cultural institutions are damaged, the matter shall be reported to the administrative department for cultural relics under the State Council for examination, verification and handling. Where other cultural relics in the collection of cultural institutions are damaged, the matter shall be reported to the administrative department for cultural relics under the peoples government of the relevant province, autonomous region or municipality directly under the Central Government for examination, verification and handling; and the said department under the relevant peoples government shall submit the results of such examination, verification and handling to the administrative department for cultural relics under the State Council for the record.

Where cultural relics in the collection of a cultural institution are stolen, robbed or missing, the institution hall immediately report the case to a public security organ and at the same time to the competent administrative department for cultural relics.

Article 49 No workers of the administrative department for cultural relics and the institution for the collection of State-owned cultural relics may borrow State-owned cultural relics or illegally take them into their own possession.

Chapter V

Cultural Relics in Peoples Collection

Article 50 Citizens, legal persons and other organizations, except institutions for the collection of cultural relics, may collect cultural relics obtained through the following channels:

(1)lawfully inheriting or accepting as gifts;

(2)purchasing from cultural relics stores;

(3)purchasing from auction enterprises engaged in auction of cultural relics;

(4)mutually exchanging or transferring in accordance with law the cultural relics lawfully owned by individual citizens; or

(5)other lawful channels prescribed by the State.

Cultural relics, as specified in the preceding paragraph, which are in the collection of citizens, legal persons and other organizations, except the institutions for the collection of cultural relics, may be circulated according to law.

Article 51 No citizens, legal persons or other organizations may purchase or sell the following cultural relics:

(1)state-owned cultural relics, except ones with the approval of the State;

(2)valuable cultural relics in the collection of the cultural institutions not owned by the State;

(3)such of the State-owned irremovable cultural relics as murals, carvings and components of buildings, except such of the State-owned irremovable cultural relics as murals, carvings and components of buildings that are dismantled according to law but are not collected by the institutions for the collection of cultural relics and therefore are not governed by the provisions in the fourth paragraph of Article 20 in this Law; or

(4)cultural relics not obtained through the channels provided for in Article 50 of this Law.

Article 52 The State encourages citizens, legal persons and other organizations, except the institutions for the collection of cultural relics, to donate the cultural relics in their collection to the institutions for the collection of State-owned cultural relics or to lend them to institutions for the collection of cultural relics for exhibition and research.

Institutions for the collection of State-owned cultural relics shall honor and comply with the wishes of donors and keep the donated relics in proper collection and preservation and make appropriate display of them.

No cultural relics that the State prohibits from leaving the country may be transferred, leased or pledged to foreigners.

Article 53 The establishment of cultural relics stores shall be subject to approval by the administrative department for cultural relics under the State Council or by the administrative department for cultural relics under the peoples government of the relevant province, autonomous region or municipality directly under the Central Government, and the stores shall be administered according to law.

No cultural relics stores may engage in auction of cultural relics or set up auction enterprises for the purpose.

Article 54 Auction enterprises established according to law for the auction of cultural relics are required to obtain license for auction of cultural relics issued by the administrative department for cultural relics under the State Council.

No auction enterprises engaged in auction of cultural relics may conduct business activities of purchasing or selling cultural relics or set up cultural relics stores.

Article 55 No workers of the administrative departments for cultural relics may establish or participate in the establishment of cultural relics stores or auction enterprises engaged in auction of cultural relics.

No institutions for the collection of cultural relics may establish or participate in the establishment of cultural relics stores or auction enterprises engaged in auction of cultural relics.

The establishment of cultural relics stores or auction enterprises engaged in auction of cultural relics in the form of Chinese-foreign equity joint venture, Chinese-foreign contractual joint venture or wholly foreign-owned venture is prohibited.

Except for cultural relics stores and auction enterprises engaged in auction of cultural relics that have obtained approval, no other units or individuals may engage in business activities relating to cultural relics.

Article 56 Cultural relics to be sold by cultural relics stores shall, prior to their sale, be examined and verified by the administrative department for cultural relics under the peoples government of the relevant province, autonomous region or municipality directly under the Central Government; and the ones approved for sale shall be marked by the said administrative department.

Cultural relics for auction by auction enterprises shall, prior to their auction, be examined and verified by the administrative department for cultural relics under the peoples government of the relevant province, autonomous region or municipality directly under the Central Government, and the matter shall be reported to the administrative department for cultural relics under the State Council for the record; and where the said administrative department cannot determine whether the relics in question may be auctioned, it shall submit the relics to the administrative department for cultural relics under the State Council for examination and verification.

Article 57 Cultural relics stores and auction enterprises shall, in accordance with the relevant regulations of the State, keep records of the cultural relics they purchase and sell or auction and submit the records to the administrative department for cultural relics that originally examined and verified the relics for the record.

Where the client or buyer requests to keep his identity secret when auctioning cultural relics, the administrative department for cultural relics shall do so, except where otherwise provided for in laws and administrative rules and regulations.

Article 58 When the administrative department for cultural relics examines and verifies the cultural relics that are to be put up for auction, it may designate an institution for the collection of State-owned cultural relics to enjoy the priority in purchasing the valuable ones among them. The purchasing prices may, through consultation, be determined between the representatives of the institution and the trustor of the cultural relics.

Article 59 Banks, smelteries, paper mills and units for the recovery of old and waste materials shall be responsible, jointly with the local administrative department for cultural relics, for sorting out cultural relics from among gold and silver articles and waste materials. The cultural relics thus sorted out, except for coins and other kinds of currency of past ages which are needed for research by banks and which may be kept by them, shall be turned over to the local administrative department for cultural relics. Reasonable compensation shall be paid for the sorted out cultural relics that are turned over.

Chapter VI

Taking or Bringing Cultural

Relics out of or into China

Article 60 No state-owned cultural relics, valuable cultural relics among the ones not owned by the State or other cultural relics that are prohibited from being taken out of China according to State regulations may be taken out of the country, except the ones to be taken out of the country for exhibition in accordance with the provisions of this Law or for special needs upon approval by the State Council.

Article 61 Cultural relics to be taken out of the country shall be subject to examination and verification by the examination and verification authority for the entry and exit of cultural relics designated by the administrative department for cultural relics under the State Council. For the cultural relics that may be taken out of the country after examination and verification, the administrative department for cultural relics under the State Council shall issue an exit permit, and they shall be shipped out of the country at the port designated by the said administrative department.

Cultural relics to be transported, mailed or taken out of the country by any units or individuals shall be declared to the Customs; and the Customs shall let them leave the country on the strength of their exit permit.

Article 62 Cultural relics to be taken out of the country for exhibition shall be subject to approval by the administrative department for cultural relics under the State Council; and if the number of Grade One cultural relics exceeds the quota fixed by the State Council,the matter shall be subject to approval by the State Council.

The only existing or fragile relics among the Grade One cultural relics are prohibited from being taken out of the country for exhibition.

Cultural relics to be taken out of the country for exhibition shall be examined, verified and registered by the examination and verification authority for entry and exit of cultural relics. The Customs shall let them leave the country on the strength of the approval document issued by the administrative department for cultural relics under the State Council or by the State Council. The entry of the cultural relics into the country that have been taken out for exhibition shall be examined, verified and inspected by the original examination and verification authority for the entry and exit of cultural relics.

Article 63 Temporary entry of cultural relics into the country shall be declared to the Customs, and shall be subject to examination and verification by the examination and verification authority for the entry and exit of cultural relics and be registered with it.

Before leaving the country, the cultural relics that have entered the country temporarily shall be examined, verified and inspected by the examination and verification authority for the entry and exit of cultural relics that originally examined, verified and registered them; and if all is in order, the administrative department for

cultural relics under the State Council shall issue an exit permit for these cultural relics and the Customs shall let them leave the country on the strength of the permit.

Chapter VII

Legal Liabilities

Article 64 Anyone who, in violation of the provisions of this Law, commits one of the following acts, which constitutes a crime, shall be investigated for criminal responsibility according to law:

(1)illicitly excavating sites of ancient culture and ancient tombs;

(2)intentionally or negligently damaging or destroying valuable cultural relics under State protection;

(3)selling without authorization or privately giving the cultural relics in the collection of State-owned cultural institutions to a unit not owned by the State or an individual;

(4)selling or giving, without authorization, to foreigners valuable cultural relics that the State prohibits from being taken out of the country;

(5)seeking profits by reselling the cultural relics that are prohibited by the State from being dealt in;

(6)smuggling cultural relics;

(7)robbing,plundering or privately dividing State-owned cultural relics or illicitly taking them into his possession; or

(8)other acts hindering the control over cultural relics and that shall be investigated for criminal responsibility.

Article 65 Anyone who, in violation of the provisions of this Law, causes the missing of or damage to cultural relics shall bear civil responsibility according to law.

Where the violation of the provisions of this Law constitutes an act against security administration, the public security organ shall impose a security administration punishment according to law.

Where the violation of the provisions of this Law constitutes an act of smuggling, but is not serious enough to constitute a crime, the Customs shall impose a punishment in accordance with the provisions of the relevant laws and administrative rules and regulations.

Article 66 Any unit that commits one of the following acts, which is not serious enough to constitute a crime, shall be ordered by the competent administrative department for cultural relics under the peoples government at or above the county level to put it right; if serious consequences are caused, it shall be fined not less than RMB 50,000 yuan but not more than 500,000 yuan; and if the circumstances are serious,

the authority that originally issued the qualification certificate shall revoke the certificate:

(1)without authorization, conducting construction project or such operations as blasting, drilling and digging within the area of protection for a historical and cultural site;

(2)conducting construction project in an area for the control of construction within a site protected for its historical and cultural value; the design for which is not submitted to the administrative department for cultural relics for consent or to the urban and rural construction planning department for approval, and which deforms the historical features of the site protected for its historical and cultural value;

(3)removing or dismantling irremovable cultural relics without authorization;

(4) repairing irremovable cultural relics without authorization and obviously changing their original state;

(5)without authorization, rebuilding on the original site irremovable cultural relics that are totally damaged and thus destroying the cultural relics; or

(6)in the case of a construction unit without qualification certificate for projects designed to protect cultural relics, repairing, removing or reconstructing cultural relics.

Anyone who scrawls or smears on cultural relics or does damage to them not seriously, or to the signs of the sites, which are protected for their historical and cultural value, put up in accordance with the provisions of the first paragraph of Article 15 of this Law shall be given disciplinary warning by the public security organ or by the unit where the cultural relics are located, and may, in addition, be imposed a fine.

Article 67 Where a unit puts up, within the area of protection for a site protected for its historical and cultural value or the area for the control of construction, facilities that pollute the site and its environment, or fails to bring under control within the specified time limit the existing facilities that pollute the site and its environment, it shall be imposed a punishment by the administrative department for environmental protection in accordance with the provisions of the relevant laws and administrative rules and regulations.

Article 68 Any unit or individual that commits one of the following acts shall be ordered by the competent administrative department for cultural relics under the peoples government at or above the county level to put it right and its/his unlawful gains derived therefrom shall be confiscated; if the amount of such unlawful gains is more than 10,000 yuan, it/he shall be fined not less than two times, but not more than five times, the amount of the unlawful gains; and if the amount of the unlawful gains is less than 10,000 yuan, it/he shall be fined not less than 5,000 yuan but not more than 20,000 yuan:

(1)transferring or mortgaging State-owned immovable cultural relics, or making them enterprise assets for business operation;

(2)transferring or mortgaging irremovable cultural relics not owned by the State to foreigners; or

(3)without authorization, changing the purpose of use of a site protected for State-owned cultural relics.

Article 69 Where the layout, environment, historical features, etc. of a famous city of historical and cultural value are seriously undermined, the State Council shall revoke its title of famous city of historical and cultural value; where the layout, environment, historical features, etc. of a town, neighborhood or village of historical and cultural value are seriously undermined, the peoples government of the relevant province, autonomous region or municipality directly under the Central Government shall revoke its title of neighborhood, town or village of historical and cultural value; and the persons directly in charge and the other persons directly responsible shall be given administrative sanctions according to law.

Article 70 Where a unit commits one of the following acts, which is not serious enough to constitute a crime, the competent administrative department for cultural relics under the peoples government at or above the county level shall order it to put it right and may, in addition, impose on it a fine of not more than 20,000 yuan; and if there are unlawful gains derived therefrom, such unlawful gains shall be confiscated:

(1)in the case of an institution for the collection of cultural relics, failing to have facilities against fire, robbery and natural damage installed as required by the provisions of the relevant regulations of the State;

(2)in the case of the legal representative of an institution for the collection of State-owned cultural relics, when leaving his post, failing to hand over the cultural relics in accordance with the files on the cultural relics in the collection of the institution, or the cultural relics handed over are not in agreement with the files;

(3)donating, leasing or selling State-owned cultural relics in the collection of cultural institutions to other units or individuals;

(4)disposing of State-owned cultural relics in the collection of cultural institutions in violation of the provisions of Articles 40, 41 and 45 of this Law; or

(5)in violation of the provisions of Article 43 of this Law, misappropriating or taking into one s own possession the amount of compensation gained from the cultural relics transferred, exchanged or lent according to law.

Article 71 Where a unit or individual deals in cultural relics that the State prohibits from being dealt in or transfers, leases or mortgages to foreigners cultural relics that the State prohibits from being taken out of the country, which is not serious enough to constitute a crime, the competent administrative department for cultural relics under the peoples government at or above the county level shall order it/him to put it right and confiscate its/his unlawful gains derived therefrom; if the amount of the earnings from such illegal operations is more than 10,000 yuan, it/he shall, in addition, be fined not less than two times, but not more than five times, the amount of the said earnings; and if it is less than 10, 000 yuan, it/he shall, in addition, be fined not less than 5,000 yuan but not more than 20,000 yuan.

Article 72 Where a person, without permission, establishes a cultural relics store or an auction enterprise engaged in auction of cultural relics, or engages in business operations in cultural relics, which is not serious enough to constitute a crime,

the administrative department for the industry and commerce shall, in accordance with law, stop him and confiscate his unlawful gains derived therefrom and the cultural relics dealt in; if the amount of the earnings from such illegal operations is more than 50,000 yuan, he shall be fined not less than two times, but not more than five times, the amount of the earnings; and if the amount of the said earnings is less than 50,000 yuan, he shall be fined not less than 20,000 yuan but not more than 100,000 yuan.

Article 73 Where a unit is found in one of the following circumstances, its unlawful gains and the cultural relics illegally dealt in shall be confiscated by the administrative department for industry and commerce; if the amount of earnings from such illegal operations is more than 50,000 yuan, it shall, in addition, be fined not less than the amount of, but not more than three times the amount of, such earnings; if the amount of such earnings is less than 50,000 yuan, it shall, in addition, be fined not less than 5,000 yuan but not more than 50,000 yuan; and if the circumstances are serious, its license shall be revoked by the original authority that issued the license:

(1)if a cultural relics store engages in auction of cultural relics;

(2)if an auction enterprise engaged in auction of cultural relics purchases or sells cultural relics;

(3)if the cultural relics dealt in by a cultural relics store or auctioned by an auction enterprise are not examined and verified; or

(4)if an institution for the collection of cultural relics engages in business operations in cultural relics.

Article 74 Where a person commits one of the following acts, which is not serious enough to constitute a crime, the competent administrative department for cultural relics under the peoples government at or above the county level together with the public security organ shall recover the cultural relics; and if the circumstances are serious, he shall be fined not less than 5,000 yuan but not more than 50,000 yuan:

(1)concealing or refusing to hand over cultural relics discovered; or

(2)failing to turn over the cultural relics sorted out, as required by relevant regulations.

Article 75 Any unit that commits one of the following acts shall be ordered by the competent administrative department for cultural relics under the peoples government at or above the county level to put it right:

(1)failing to report, as required by the provisions of this Law, the change in the use of the State-owned irremovable cultural relics of a site not verified as one to be protected for its historical and cultural value;

(2)failing to put on record, as required by the provisions of this Law, the transfer or mortgage of the irremovable cultural relics not owned by the State or the change in their use;

(3)in the case of a user of State-owned irremovable cultural relics, refusing to perform, in accordance with law, his obligation to repair them;

(4)in the case of an institution engaged in archaeological excavation, conducting archaeological excavation without authorization, or failing to give a truthful report of the results of the excavation;

(5)in the case of an institution for the collection of cultural relics failing to compile files of the cultural relics in its collection and establish a system of the control over them, as required by the relevant regulations of the State, or failing to report the files and the system of control for the record;

(6)in violation of the provisions of Article 38 of this Law, obtaining, through transfer, cultural relics in the collection of a cultural institution without approval;

(7)in the case of an institution for the collection of cultural relics, failing to report the damages of the cultural relics in its collection to the administrative department for cultural relics for examination, verification and disposition, or failing to report immediately to the public security organ or the administrative department for cultural relics about the cultural relics in its collection that are stolen, robbed or missing; or

(8)in the case of a cultural relics store or an auction enterprise, failing to keep records of the cultural relics it sold or auctioned, or failing to submit the records to the administrative department for cultural relics for the record, as required by the relevant regulations of the State.

Article 76 Where a worker of an administrative department for cultural relics, of an institution for the collection of cultural relics,of a cultural relics store or a cultural relics auction enterprise commits one of the following acts, he shall be given to administrative sanction according to law; if the circumstances are serious, he shall be discharged from public employment or disqualified for the job according to law; and a crime is constituted, he shall be investigated for criminal responsibility according to law:

(1)in the case of a worker of an administrative department for cultural relics, in violation of the provisions of this Law, abusing his power of examination and approval, failing to perform his functions and duties, or failing to investigate and handle unlawful acts discovered, which causes serious consequences;

(2)in the case of a worker of an administrative department for cultural relics and or an institution for the collection of State-owned cultural relics, borrowing or illegally taking into his possession State-owned cultural relics;

(3)in the case of a worker of an administrative department for cultural relics, establishing or participating in the establishment of cultural relics stores or auction enterprises engaged in auction of cultural relics;

(4)causing damage or destruction to the sites protected for their historical and cultural value and to valuable cultural relics or causing missing of such relics due to disregard of responsibility; or

(5)embezzling or misappropriating funds earmarked for the protection of cultural relics.

No persons discharged from public employment or disqualified for the job, as mentioned in the preceding paragraph, may be employed for administration of cultural

relics or to deal in cultural relics within ten years from the date of discharge or disqualification.

Article 77 Where the persons directly in charge of the unit that commits one of the following acts mentioned in Articles 66, 68, 70, 71, 74 and 75 of this Law and the other persons directly responsible are State functionaries, they shall be given administrative sanctions according to law.

Article 78 Where public security organs, the administrative departments for industry and commerce, the Customs, the departments for urban and rural construction planning and other State organs, in violation of the provisions of this Law, abuse their powers, neglect their duties, or engage in malpractice for personal gains, thus causing serious damage or destruction to the valuable cultural relics under State protection or causing their missing, the persons directly in charge and the other persons directly responsible shall be given administrative sanctions according to law; and if a crime is constituted, criminal responsibility shall be investigated according to law.

Article 79 The Peoples Courts, the Peoples Procuratorates, the public security organs, the Customs and the administrative departments for industry and commerce shall have the cultural relics confiscated according to law registered, preserved properly, and turned over to the administrative department for cultural relics gratis after settlement of the cases, and the cultural relics shall be kept in the collection of an institution for the collection of State-owned cultural relics which is designated by the administrative department for cultural relics.

Chapter VIII

Supplementary Provisions

Article 80 This Law shall go into effect as of the date of its promulgation.Regulations for the Implementation of the

Law of the Peoples Republic of China

on Protection of Cultural Relics

(Adopted at the Eighth Executive Meeting of the State Council on May 13, 2003, promulgated by Decree No. 377 of the State Council of the Peoples Republic of China on May 18, 2003, and effective as of July 1, 2003)

Chapter Ⅰ

General Provisions

Article 1 These Regulations are formulated in accordance with the Law of the Peoples Republic of China on Protection of Cultural Relics (hereinafter referred to as the Law on Protection of Cultural Relics).

Article 2 The State special subsidy funds for major cultural relics and local special funds for cultural relics are jointly managed by the competent cultural relics administrative departments, the departments in charge of investment and the finance departments of the peoples governments at or above the county level in accordance with the relevant provisions of the State. No unit or individual may take these funds into their own possession or misappropriate them.

Article 3 Incomes earned by the undertaking of the State-owned museums, memorial halls, sites protected for their historical and cultural value, etc. shall be used for the following purposes:

(1)upkeep, display, restoration and collection of cultural relics;

(2)repair, renovation and building up of State-owned museums, memorial halls and sites protected for their historical and cultural value;

(3)security measures for the safekeeping of cultural relics;

(4)archaeological investigation, prospecting and excavation; and

(5)scientific research, publicity and education in the protection of cultural relics.

Article 4 The competent cultural relics administrative departments and the competent administrative departments of education, science and technology, press and publication, and broadcasting and television shall do a good job in enhancing publicity and education in the protection of cultural relics.

Article 5 The competent cultural relics administrative department of the State Council and the competent cultural relics administrative departments of the peoples governments of the provinces, autonomous regions and municipalities directly under the Central Government shall work out scientific and technological research plans for the protection of cultural relics and take effective measures for the popularization and application of scientific and technological results in the protection of cultural relics, so as to advance the scientific and technological standard in this regard.

Article 6 Units or individuals that perform any of the deeds as listed in Article 12 of the Law on Protection of Cultural Relics shall be given moral encouragement or material rewards by the peoples governments and the competent cultural relics administrative departments thereof and other relevant departments.

Chapter Ⅱ

Immovable Cultural Relics

Article 7 The famous cities of historical and cultural value shall be reported by the competent construction administrative department of the State Council jointly with the competent cultural relics administrative department of the State Council to the State Council for verification and announcement.

The famous neighbourhoods, villages or towns of historical and cultural value shall be reported by the competent administrative departments of urban and rural planning jointly with the competent cultural relics administrative departments of the

peoples governments of the provinces, autonomous regions or municipalities directly under the Central Government to the peoples governments at the same level for verification and announcement.

Plans for the protection of famous cities of historical and cultural value, famous neighbourhoods, villages or towns of historical and cultural value, which are drawn up under the organization of the local peoples governments at or above the county level, shall meet the requirements for the protection of cultural relics.

Article 8 The peoples government of the province, autonomous region or municipality directly under the Central Government shall, within one year from the date of verification and announcement of a major site protected for its historical and cultural value at the national level or a site protected for its historical and cultural value at the provincial level, delimit the necessary area of protection, put up a sign or notice therefor, establish records and files thereof, and establish special organs or assign full-time persons to be responsible for the control over the site.

Within one year from the date of verification and announcement of a site protected for its historical and cultural value at the level of a city divided into districts, at the level of an autonomous prefecture or at the county level, the peoples government that has verified and announced the site shall delimit the area of protection, put up a sign or notice therefor, establish records and files thereof, and establish special organs or assign full-time persons to be responsible for the control over the site.

Article 9 The area of protection for a site protected for its historical and cultural value shall cover both the site proper and the surrounding areas for which special protection is enforced over a certain parameter.

The area of protection for a site protected for its historical and cultural value shall be delimited rationally in light of the classification, size and contents of the site as well as the historical and actual conditions of the surrounding environment, and a certain additional safe space shall be kept beyond the site proper, so as to preserve its true identity and integrity.

Article 10 The sign or notice for a site protected for its historical and cultural value shall include its grade, name, organ and date of announcement, organ of putting up the sign or notice and date of its establishment. The sign or notice for a site in an autonomous region of an ethnic group protected for its historical and cultural value shall be in both standard Han characters and the ethnic language commonly used in the locality.

Article 11 The records and files of a site protected for its historical and cultural value shall include written descriptions of the site proper, scientific and technological data, related documentary accounts and contents concerning its administrative management.

The records and files of a site protected for its historical and cultural value shall make full use of the forms such as written language, sound and video recordings, pictures, rubbings, facsimiles and electronic copies so as to give effective expressions to the contents they carry on.

Article 12 For a site of ancient culture, ancient tomb, cave temple, State-owned memorial building or ancient architectural structure that is verified and announced as a site protected for its historical and cultural value, the local peoples government at or above the county level shall establish a special organ or assign an organ to be responsible for the control over the site. For any other site protected for its historical and cultural value, the local peoples government at or above the county level shall establish a special organ or assign an organ or a full-time person to be responsible for the control over the site; where a full-time person is assigned to be responsible for the control over the site, the said person may be employed as a cultural relics guard.

Where a site protected for its historical and cultural value is under use by a unit, the unit shall set up a mass organization for the protection of cultural relics; where there is no such a unit, the villagers committee or residents committee of the place where the site protected for its historical and cultural value is located may set up a mass organization for the protection of cultural relics. The competent cultural relics administrative department shall give guidance and support to such mass organization for the protection of cultural relics in its activities.

An organ responsible for the control over a site protected for its historical and cultural value shall work out and improve sound regulations and systems and adopt security measures; its security persons may be equipped with defensive weapons in accordance with law.

Article 13 The area for control of construction around a site protected for its historical and cultural value refers to an area, beyond the area of protection of the said site, in which the construction of any project is restricted with a view to protecting the safety, environment and historical features of the site.

The area for control of construction around a site protected for its historical and cultural value shall be delimited rationally in light of the classification, size and contents of the site and the historical and actual situations of its surrounding environment.

Article 14 The area for control of construction around a major site protected for its historical and cultural value at the national level shall, upon approval by the peoples government of the province, autonomous region or municipality directly under the Central Government, be delimited and announced by the competent cultural relics administrative department jointly with the administrative department of urban and rural planning of the peoples government of the province, autonomous region or municipality directly under the Central Government.

The area for control of construction around a site protected for its historical and cultural value at the provincial level, at the level of a city divided into districts, at the level of an autonomous prefecture or at the county level shall, upon approval by the peoples government of the province, autonomous region or municipality directly under the Central Government, be delimited and announced by the competent cultural relics administrative department jointly with the administrative department of urban and rural planning of the peoples government approving and announcing the site.

Article 15 A unit undertaking the repair, removal, or reconstruction of a site protected for its historical and cultural value shall obtain both the qualification certificate of an appropriate grade for projects designed to protect cultural relics issued

by the competent cultural relics administrative department and the qualification certificate of an appropriate grade issued by the competent construction administrative department, whereas the work of repair, removal or reconstruction of a site protected for its historical and cultural value shall, if not involving construction activities, be undertaken by a unit that has obtained the qualification certificate of an appropriate grade for projects designed to protect cultural relics issued by the competent cultural relics administrative department.

Article 16 An applicant for obtaining the qualification certificate for projects designed to protect cultural relics shall meet the following conditions:

(1)having persons with a technical title in the profession of cultural relics and museology;

(2)having technical equipment for the projects designed to protect cultural relics; and

(3)other conditions as provided by laws and administrative regulations.

Article 17 To apply to obtain the qualification certificate for projects designed to protect cultural relics, an application therefor shall be submitted to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government or to the competent cultural relics administrative department of the State Council, which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue the qualification certificate of an appropriate grade for projects designed to protect cultural relics when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval. The criteria for varying grades of qualifications for projects designed to protect cultural relics and the measures for examination and approval shall be formulated by the competent cultural relics administrative department of the State Council.

Article 18 The competent cultural relics administrative department shall, before examining and approving the repair plan and engineering design programme for a site protected for its historical and cultural value, solicit opinions from the competent cultural relics administrative department of the peoples government at the next higher level.

Article 19 The peoples government of the province, autonomous region or municipality directly under the Central Government shall be responsible for investigating and handling the building or structure that threatens the safety of any major site protected for its historical and cultural value at the national level or damages its historical features.

The peoples government verifying and announcing the site shall be responsible for investigating and handling the building or structure that threatens the safety of any site protected for its historical and cultural value at the provincial level, at the level of a city divided into districts, at the level of an autonomous prefecture or at the county level, or damages its historical features.

The peoples government at the county level shall be responsible for investigating and handling the building or structure that threatens the safety of any immovable cultural relics that have not yet been verified and announced as a site protected for its historical and cultural value.

Chapter Ⅲ

Archaeological Excavations

Article 20 An institution applying to engage in archaeological excavations and to obtain a qualification certificate for archaeological excavations shall meet the following conditions:

(1)having four or more persons qualified as team leaders for archaeological excavations;

(2)having persons with a technical title in the profession of cultural relics and museology;

(3)having professionals for protecting the safety of cultural relics;

(4)having technical equipment for archaeological excavations;

(5)having facilities and premises for safeguarding the safety of cultural relics; and

(6)other condition as provided by laws and administrative regulations.

Article 21 To obtain a qualification certificate for archaeological excavations, an application therefor shall be submitted to the competent cultural relics administrative department of the State Council, which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue a qualification certificate for archaeological excavations when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

Article 22 A system of responsibility of team leaders shall be practised in all archaeological excavation projects. A person who is to hold the position of team leader shall obtain a qualification certificate for team leader for archaeological excavations issued by the competent cultural relics administrative department of the State Council in accordance with the relevant provisions of the State.

Article 23 The archaeological investigation, prospecting and excavation to be carried out along with a construction project shall be organized and conducted by the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government. The archaeological investigation, prospecting and excavation in a construction project covering two or more provinces, autonomous regions and municipalities directly under the Central Government shall be jointly organized and conducted by the competent cultural relics administrative departments of the peoples governments of the provinces, autonomous regions and municipalities directly under the Central Government where

the construction project is located, whereas the archaeological investigation, prospecting and excavation in a construction project of special importance shall be organized and conducted by the competent cultural relics administrative department of the State Council.

The construction unit shall provide assistance to the archaeological investigation, prospecting and excavation carried out along with a construction project, and shall not hinder such archaeological investigation, prospecting and excavation.

Article 24 The competent cultural relics administrative department of the State Council shall make a decision of approval or disapproval within 30 working days from the date of receipt of an excavation plan as provided in the first paragraph of Article 30 of the Law on Protection of Cultural Relics, and shall issue a document of approval when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

In case of rescue excavation as provided in the second paragraph of Article 30 of the Law on Protection of Cultural Relics, the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government shall, within ten working days from the date of commencement of the excavation, undergo the formalities of examination and approval retroactively with the competent cultural relics administrative department of the State Council.

Article 25 The range and rate of funds needed for archaeological investigation, prospecting and excavation shall be subject to the relevant provisions of the State.

Article 26 An institution engaged in archaeological excavations shall, within 30 working days from the date of completion of an archaeological excavation project, submit a project completion report to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government and the competent cultural relics administrative department of the State Council, and shall, within three years from the date of submission of the project completion report, submit an archaeological excavation report to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government and the competent cultural relics administrative department of the State Council.

Article 27 After submission of the archaeological excavation report, the institution engaged in archaeological excavations may retain a small amount of unearthed cultural relics as samples for scientific research, upon approval by the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government or the competent cultural relics administrative department of the State Council within their respective functions and powers, and shall, within six months from the date of submission of the excavation report, turn over other unearthed cultural relics for collection to the State-owned museums, libraries or other State-owned institutions for the collection of cultural relics designated by the competent cultural relics administrative department of the peoples government of the province, autonomous

region or municipality directly under the Central Government or the competent cultural relics administrative department of the State Council.

Chapter Ⅳ

Cultural Relics in the Collection of Cultural Institutions

Article 28 An institution for the collection of cultural relics shall set up a system of receipt,assessment,registration,cataloguing and filing of cultural relics in its collection,a system of warehouse management, a system of entry, taking out and cancellation of cultural relics as well as their statistics and a system of maintenance, restoration and reproduction.

Article 29 The competent cultural relics administrative department of the peoples government at the county level shall, in accordance with the relationship of administrative subordination, submit for the record the files for the cultural relics in the collection of various cultural institutions within its administrative area to the competent cultural relics administrative department of the peoples government at the level of a city divided into districts or at the level of an autonomous prefecture or to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government; the competent cultural relics administrative department of the peoples government at the level of a city divided into districts or at the level of an autonomous prefecture shall submit for the record the files for the cultural relics in the collection of various cultural institutions within its administrative area to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government; the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government shall submit for the record the files for the collected grade-one cultural relics within its administrative area to the competent cultural relics administrative department of the State Council.

Article 30 Where an institution for the collection of cultural relics borrows cultural relics from another institution, the borrower shall take necessary protection measures for the borrowed cultural relics so as to ensure their security.

Unless otherwise agreed upon by the parties concerned, the risk of destruction, loss or damage of the borrowed cultural relics shall be borne by the institution for the collection of cultural relics that borrows the said cultural relics.

Article 31 Where an institution for the collection of State-owned cultural relics fails to compile files for the cultural relics in its collection and submit such files to the competent cultural relics administrative department for the record pursuant to the provisions of Article 36 of the Law on Protection of Cultural Relics, it shall not exchange or lend cultural relics from its collection.

Article 32 Repairs, duplication or making rubbings of grade-two or grade-three cultural relics in the collection of a cultural institution shall be reported for approval to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government. Repairs, duplication or making rubbings of grade-one cultural relics in the collection of a cultural institution shall, upon examination and verification by the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government, be reported to the competent cultural relics administrative department of the State Council for approval.

Article 33 An institution engaged in repairs, duplication or making rubbings of cultural relics in the collection of cultural institutions shall meet the following conditions:

(1)having persons with a technical title at or above the intermediate level in the profession of cultural relics and museology;

(2)having premises and technical equipment for repairs, duplication and making rubbings of cultural relics in the collection of cultural institutions; and

(3)other conditions as provided by laws and administrative regulations.

Article 34 To engage in repairs, duplication or making rubbings of cultural relics in the collection of cultural institutions, an application therefor shall be submitted to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government, which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue a qualification certificate of an appropriate grade when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

Article 35 Taking photos of grade-two or grade-three cultural relics in the collection of cultural institutions for producing publications or making sound or video recordings shall be reported for approval to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government. Taking photos of grade-one cultural relics in the collection of cultural institutions shall, upon examination and verification by the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government, be reported to the competent cultural relics administrative department of the State Council for approval.

Article 36 Where the cultural relics in the collection of a cultural institution are stolen, robbed or missing, the institution for the collection of the said cultural relics shall report the case to the public security organ without delay, and, at the same time, report the case to the competent cultural relics administrative department; the competent cultural relics administrative department shall, within 24 hours after the receipt of the report from the institution for the collection of the said cultural relics, report the relevant situations to the competent cultural relics administrative department of the State Council.

Article 37 The State organs and State-owned enterprises, institutions or other organizations that collect or preserve State-owned cultural relics shall fulfil the following obligations:

(1)to set up a file system for the cultural relics in their collection and submit the files for the cultural relics for the record to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government in the place where they are located;

(2)to set up and improve an administrative system for the maintenance and repair of the cultural relics in their collection so as to ensure the security of the cultural relics; and

(3)where the cultural relics in their collection are stolen, robbed or missing, they shall report the case to the public security organ without delay, and, at the same time, report the case to the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government in the place where they are located.

Chapter Ⅴ

Cultural Relics in Peoples Collection

Article 38 Citizens, legal persons and other organizations, except institutions for the collection of cultural relics, may collect cultural relics in accordance with law, and the ownership of their cultural relics legally collected shall be protected by law.

Citizens, legal persons and other organizations that legally collect cultural relics may request the competent cultural relics administrative department to provide them with consultancy services concerning assessment, repair and preservation of the cultural relics collected by them.

Article 39 A cultural relics store to be established shall meet the following conditions:

(1)having a registered capital of 2,000,000 yuan or more;

(2)having five or more persons with a technical title at or above the intermediate level in the profession of cultural relics and museology;

(3)having premises, facilities and technical resources for the preservation of cultural relics; and

(4)other conditions as provided by laws and administrative regulations.

Article 40 To establish a cultural relics store, an application therefor shall, in accordance with the provisions of the competent cultural relics administrative department of the State Council, be submitted to the competent cultural relics administrative department of the peoples government at or above the level of the province, autonomous region or municipality directly under the Central Government,

which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue a document of approval when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

Article 41 Where an auction enterprise established in accordance with law engages in auction of cultural relics, it shall have five or more professional cultural relics auctioneers with a senior technical title in the profession of cultural relics and museology, and shall obtain the licence for auction of cultural relics issued by the competent cultural relics administrative department of the State Council.

Article 42 To apply to obtain the licence for auction of cultural relics, an auction enterprise established in accordance with law shall submit an application therefor to the competent cultural relics administrative department of the State Council, which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue the licence for auction of cultural relics when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

Article 43 Where an cultural relics store purchases or sells a cultural relic, or an auction enterprise engaged in auction of cultural relics sells a cultural relic by auction, it shall record the name, picture and origin of each cultural relic, the name or designation, residence, number of the valid identification document/certificate of the seller, client and buyer of each cultural relic as well as the transaction price of each deal, and report all of them for the record to the competent cultural relics administrative department that has approved the sale or auction of the cultural relic. The competent cultural relics administrative department that receives the record shall keep confidentiality for them in accordance with law and keep that record for 75 years.

The competent cultural relics administrative department shall enhance its supervision and inspection over cultural relics stores and auction enterprises engaged in auction of cultural relics.

Chapter Ⅵ

Taking or Bringing Cultural Relics out of or into China

Article 44 An examination and verification authority for the entry and exit of cultural relics designated by the competent cultural relics administrative department of the State Council shall be staffed with five or more full-time responsible assessors for the entry and exit of cultural relics. A full-time responsible assessor for the entry and exit of cultural relics shall acquire a technical title at or above the intermediate level in the profession of cultural relics and museology and shall be subject to and pass the examination of the competent cultural relics administrative department of the State Council.

Article 45 Where cultural relics are to be transported, mailed or carried out of the country, the matter shall be reported in accordance with law to the examination and verification authority for the entry and exit of cultural relics for examination and

verification before the cultural relics are taken out of the country. The examination and verification authority for the entry and exit of cultural relics shall, within 15 working days from the date of receipt of the application, make a decision on whether the cultural relics are permitted to be taken out of the country.

When the examination and verification authority for the entry and exit of cultural relics examines and verifies cultural relics, there shall be three or more professional technicians in cultural relics and museology who participate in the examination and verification, and at least two of them shall be the responsible assessors for the entry and exit of cultural relics.

The opinion on examination and verification for the exit of cultural relics shall be jointly signed by the responsible assessors for the entry and exit of cultural relics; unless the responsible assessors for the entry and exit of cultural relics unanimously agree that the cultural relics are permitted to be taken out of the country, the examination and verification authority for the entry and exit of cultural relics may not make a decision to permit the cultural relics to be taken out of the country.

The criteria of examination and verification for the exit of cultural relics shall be worked out by the competent cultural relics administrative department of the State Council.

Article 46 The examination and verification authority for the entry and exit of cultural relics shall register the name, quality and texture, size and grade of the cultural relics under its examination and verification for the entry into or exit from the country, and the name or designation, residence, number of the valid identification document/certificate of the party concerned as well as the ports of entry and exit, the destination of the cultural relics, the date of examination and verification and other particulars.

Article 47 Cultural relics that are permitted to be taken out of the country upon examination and verification shall be granted an exit permit by the competent cultural relics administrative department of the State Council, and be marked with an exit label by the examination and verification authority for the entry and exit of cultural relics. Cultural relics permitted to be taken out of the country upon examination and verification shall be shipped out of the country at the port designated by the competent cultural relics administrative department of the State Council. The Customs shall let the cultural relics leave the country on the strength of their exit permit after the inspection of the exit label.

Cultural relics that are not permitted to be taken out of the country upon examination and verification shall be returned to the party concerned by the examination and verification authority for the entry and exit of cultural relics.

Article 48 Where cultural relics are to be taken out of the country for exhibition, the unit organizing the exhibition shall, six months before the exhibition, submit an application therefor to the competent cultural relics administrative department of the State Council. The competent cultural relics administrative department of the State Council shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue a document of approval when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

It shall be reported to the State Council for approval if there are more than 120 pieces (sets) of grade-one cultural relics to be exhibited or the number of grade-one cultural relics to be exhibited takes up 20 percent of the total exhibits.

Article 49 The only existing or fragile relics among the grade-one cultural relics are prohibited from being taken out of the country for exhibition. The catalogue of cultural relics prohibited from being taken out of the country for exhibition shall be made public on a regular basis by the competent cultural relics administrative department of the State Council.

Cultural relics that have never been officially exhibited within the country shall not be taken out of the country for exhibition.

Article 50 The duration for the exhibition of cultural relics out of the country shall not be longer than one year. The duration may, due to special purposes, be extended upon approval by the original examination and approval authority. However, the extension shall not be longer than one year.

Article 51 Where there exists the possibility of jeopardizing the security of the cultural relics being exhibited during the exhibition out of the country, the original examination and approval authority may decide to suspend or cancel the exhibition.

Article 52 Cultural relics temporarily entering the country shall be sealed by the Customs before they are turned over to the party concerned, who shall present them to the examination and verification authority for the entry and exit of cultural relics for examination, verification and registration. Upon examining the seals of the Customs and making sure that they remain intact, the examination and verification authority for the entry and exit of cultural relics shall mark each piece of cultural relics temporarily entering the country with a temporary entry label, and register and take photos of them.

When the cultural relics temporarily entering the country leave the country, the examination and verification authority for the entry and exit of cultural relics that has examined, verified and registered the said cultural relics shall check against the entry register and photos, and mark them with exit labels after examining the temporary entry labels and making sure that they are correct, and the competent cultural relics administrative department of the State Council shall grant an exit permit thereto.

Where, without going through the formalities as provided in the first paragraph of this Article, the cultural relics temporarily entering the country leave the country, the matter shall be dealt with in accordance with the provisions of this Chapter on exit of cultural relics.

Article 53 No unit or individual may, without approval, remove, replace, misappropriate or damage exit labels and temporary entry labels for cultural relics.

Chapter Ⅶ

Legal Liability

Article 54 Where, in violation of the provisions of these Regulations, public security organs, departments for industry and commerce, cultural relics administrative departments, the Customs, departments for urban and rural planning and construction and other relevant departments, and their staff members as well, abuse the power of examination and approval, fail to perform their duties or fail to investigate and deal with illegal acts upon discovery, the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law; if a crime is constituted, criminal liability shall be investigated in accordance with law.

Article 55 Where, in violation of the provisions of these Regulations, anyone undertakes the repair, removal or reconstruction of a site protected for its historical and cultural value without obtaining a qualification certificate of an appropriate grade for projects designed to protect cultural relics, it shall be ordered by the competent cultural relics administrative department to make corrections within a specified time limit; if it fails to make corrections within the specified time limit, or causes serious consequences, a fine of not less than 50,000 yuan but not more than 500,000 yuan shall be imposed; if a crime is constituted, criminal liability shall be investigated in accordance with law.

Where, in violation of the provisions of these Regulations, anyone undertakes the repair, removal or reconstruction of a site protected for its historical and cultural value, in which construction activities are involved, without obtaining a qualification certificate of an appropriate grade issued by the competent construction administrative department, it shall be penalized by the competent construction administrative department in accordance with the relevant provisions of laws and administrative regulations.

Article 56 Where, in violation of the provisions of these Regulations, anyone engages in repairs, duplication, or making rubbings of cultural relics in the collection of cultural institutions without obtaining a qualification certificate, it shall be ordered by the competent cultural relics administrative department to cease its illegal activities; its illegal gains and the tools and equipment specially used for illegal activities shall be confiscated; if serious consequences are caused, a fine of not less than 10,000 yuan but not more than 100,000 yuan shall be imposed; if a crime is constituted, criminal liability shall be investigated in accordance with law.

Article 57 The amount of the fine as provided for in the second paragraph of Article 66 of the Law on Protection of Cultural Relics shall be not more than 200 yuan.

Article 58 Anyone who, in violation of the provisions of these Regulations, repairs, duplicates, makes rubbings of or takes photos of valuable cultural relics in the collection of cultural institutions without approval, shall be given a warning by the competent cultural relics administrative department; if serious consequences are caused, a fine of not less than 2,000 yuan but not more than 20,000 yuan shall be imposed; the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law.

Article 59 Where, in violation of the provisions of these Regulations, an archaeological excavation institution fails to submit a project completion report or an archaeological excavation report within the prescribed time limit, the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government or the

competent cultural relics administrative department of the State Council shall order it to make corrections within a specified time limit; if it fails to make corrections within the specified time limit, the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law.

Article 60 Where, in violation of the provisions of these Regulations, an archaeological excavation institution fails to transfer cultural relics within the prescribed time limit, the competent cultural relics administrative department of the peoples government of the province, autonomous region or municipality directly under the Central Government or the competent cultural relics administrative department of the State Council shall order it to make corrections within a specified time limit; if it fails to make corrections within the specified time limit, or causes serious consequences, the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law.

Article 61 Where, in violation of the provisions of these Regulations, the exhibition of cultural relics out of the country exceeds the duration for exhibition, the competent cultural relics administrative department of the State Council shall order corrections to be made within a specified time limit; the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law.

Article 62 Where, in accordance with the provisions of Article 66 or Article 73 of the Law on Protection of Cultural Relics, a unit has its licence revoked due to an administrative penalty imposed thereupon, it shall go through the formalities of alteration registration or cancellation registration in accordance with law with the administrative department for industry and commerce; if it fails to go through the formalities within the specified time limit, the administrative department for industry and commerce shall revoke its business licence.

Article 63 Where, in violation of the provisions of these regulations, incomes earned by the undertaking of the State-owned museums, memorial halls, sites protected for their historical and cultural value, etc. are diverted for other purposes, the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law; if a crime is constituted, criminal liability shall be investigated in accordance with law.

Chapter Ⅷ

Supplementary Provision

Article 64 These Regulations shall be effective as of July 1, 2003.

（source：http://www.sach.gov.cn/sach_tabid_369/tabid/311/InfoID/383/Default.html）

Appendix V

Regulation for the Implementation of the Cultural Relics Protection Law of the People's Republic of China

Regulations for the Implementation of the Law of the People's Republic of China on Protection of Cultural Relics

(Adopted at the Eighth Executive Meeting of the State Council on May 13, 2003, promulgated by Decree No. 377 of the State Council of the People's Republic of China on May 18, 2003, and effective as of July 1, 2003)

Chapter I General Provisions

Article 1 These Regulations are formulated in accordance with the Law of the People's Republic of China on Protection of Cultural Relics (hereinafter referred to as the Law on Protection of Cultural Relics).

Article 2 The State special subsidy funds for major cultural relics and local special funds for cultural relics are jointly managed by the competent cultural relics administrative departments, the departments in charge of investment and the finance departments of the people's governments at or above the county level in accordance with the relevant provisions of the State. No unit or individual may take these funds into their own possession or misappropriate them.

Article 3 Incomes earned by the undertaking of the State-owned museums, memorial halls, sites protected for their historical and cultural value, etc. shall be used for the following purposes:

(1) upkeep, display, restoration and collection of cultural relics;

(2) repair, renovation and building up of State-owned museums, memorial halls and sites protected for their historical and cultural value;

(3) security measures for the safekeeping of cultural relics;

(4) archaeological investigation, prospecting and excavation; and

(5) scientific research, publicity and education in the protection of cultural relics.

Article 4 The competent cultural relics administrative departments and the competent administrative departments of education, science and technology, press and publication, and broadcasting and television shall do a good job in enhancing publicity and education in the protection of cultural relics.

Article 5 The competent cultural relics administrative department of the State Council and

the competent cultural relics administrative departments of the people's governments of the provinces, autonomous regions and municipalities directly under the Central Government shall work out scientific and technological research plans for the protection of cultural relics and take effective measures for the popularization and application of scientific and technological results in the protection of cultural relics, so as to advance the scientific and technological standard in this regard.

Article 6 Units or individuals that perform any of the deeds as listed in Article 12 of the Law on Protection of Cultural Relics shall be given moral encouragement or material rewards by the people's governments and the competent cultural relics administrative departments thereof and other relevant departments.

Chapter II Immovable Cultural Relics

Article 7 The famous cities of historical and cultural value shall be reported by the competent construction administrative department of the State Council jointly with the competent cultural relics administrative department of the State Council to the State Council for verification and announcement.

The famous neighbourhoods, villages or towns of historical and cultural value shall be reported by the competent administrative departments of urban and rural planning jointly with the competent cultural relics administrative departments of the people's governments of the provinces, autonomous regions or municipalities directly under the Central Government to the people's governments at the same level for verification and announcement.

Plans for the protection of famous cities of historical and cultural value, famous neighbourhoods, villages or towns of historical and cultural value, which are drawn up under the organization of the local people's governments at or above the county level, shall meet the requirements for the protection of cultural relics.

Article 8 The people's government of the province, autonomous region or municipality directly under the Central Government shall, within one year from the date of verification and announcement of a major site protected for its historical and cultural value at the national level or a site protected for its historical and cultural value at the provincial level, delimit the necessary

area of protection, put up a sign or notice therefor, establish records and files thereof, and establish special organs or assign full-time persons to be responsible for the control over the site.

Within one year from the date of verification and announcement of a site protected for its historical and cultural value at the level of a city divided into districts, at the level of an autonomous prefecture or at the county level, the people's government that has verified and announced the site shall delimit the area of protection, put up a sign or notice therefor, establirh records and files thereof, and establish special organs or assign full-time persons to be responsible for the control over the site.

Article 9 The area of protection for a site protected for its historical and cultural value shall cover both the site proper and the surrounding areas for which special protection is enforced over a certain parameter.

The area of protection for a site protected for its historical and cultural value shall be delimited rationally in light of the classification, size and contents of the site as well as the historical and actual conditions of the surrounding environment, and a certain additional safe space shall be kept beyond the site proper, so as to preserve its true identity and integrity.

Article 10 The sign or notice for a site protected for its historical and cultural value shall include its grade, name, organ and date of announcement, organ of putting up the sign or notice and date of its establishment. The sign or notice for a site in an autonomous region of an ethnic group protected for its historical and cultural value shall be in both standard Han characters and the ethnic language commonly used in the locality.

Article 11 The records and files of a site protected for its historical and cultural value shall include written descriptions of the site proper, scientific and technological data, related documentary accounts and contents concerning its administrative management.

The records and files of a site protected for its historical and cultural value shall make full use of the forms such as written language, sound and video recordings, pictures, rubbings, facsimiles and electronic copies so as to give effective expressions to the contents they carry on.

Article 12 For a site of ancient culture, ancient tomb, cave temple, State-owned memorial building or ancient architectural structure that is verified and announced as a site protected for its historical and cultural value, the local people's government at or above the county level shall establish a special organ or assign an organ to be responsible for the control over the site. For any

other site protected for its historical and cultural value, the local people's government at or above the county level shall establish a special organ or assign an organ or a full-time person to be responsible for the control over the site; where a full-time person is assigned to be responsible for the control over the site, the said person may be employed as a cultural relics guard.

Where a site protected for its historical and cultural value is under use by a unit, the unit shall set up a mass organization for the protection of cultural relics; where there is no such a unit, the villagers committee or residents committee of the place where the site protected for its historical and cultural value is located may set up a mass organization for the protection of cultural relics. The competent cultural relics administrative department shall give guidance and support to such mass organization for the protection of cultural relics in its activities.

An organ responsible for the control over a site protected for its historical and cultural value shall work out and improve sound regulations and systems and adopt security measures; its security persons may be equipped with defensive weapons in accordance with law.

Article 13 The area for control of construction around a site protected for its historical and cultural value refers to an area, beyond the area of protection of the said site, in which the construction of any project is restricted with a view to protecting the safety, environment and historical features of the site.

The area for control of construction around a site protected for its historical and cultural value shall be delimited rationally in light of the classification, size and contents of the site and the historical and actual situations of its surrounding environment.

Article 14 The area for control of construction around a major site protected for its historical and cultural value at the national level shall, upon approval by the people's government of the province, autonomous region or municipality directly under the Central Government, be delimited and announced by the competent cultural relics administrative department jointly with the administrative department of urban and rural planning of the people's government of the province, autonomous region or municipality directly under the Central Government.

The area for control of construction around a site protected for its historical and cultural value at the provincial level, at the level of a city divided into districts, at the level of an autonomous prefecture or at the county level shall, upon approval by the people's government of the province, autonomous region or municipality directly under the Central Government, be

delimited and announced by the competent cultural relics administrative department jointly with the administrative department of urban and rural planning of the people's government approving and announcing the site.

Article 15 A unit undertaking the repair, removal, or reconstruction of a site protected for its historical and cultural value shall obtain both the qualification certificate of an appropriate grade for projects designed to protect cultural relics issued by the competent cultural relics administrative department and the qualification certificate of an appropriate grade issued by the competent construction administrative department, whereas the work of repair, removal or reconstruction of a site protected for its historical and cultural value shall, if not involving construction activities, be undertaken by a unit that has obtained the qualification certificate of an appropriate grade for projects designed to protect cultural relics issued by the competent cultural relics administrative department.

Article 16 An applicant for obtaining the qualification certificate for projects designed to protect cultural relics shall meet the following conditions:

(1) having persons with a technical title in the profession of cultural relics and museology;

(2) having technical equipment for the projects designed to protect cultural relics; and

(3) other conditions as provided by laws and administrative regulations.

Article 17 To apply to obtain the qualification certificate for projects designed to protect cultural relics, an application therefor shall be submitted to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government or to the competent cultural relics administrative department of the State Council, which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue the qualification certificate of an appropriate grade for projects designed to protect cultural relics when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval. The criteria for varying grades of qualifications for projects designed to protect cultural relics and the measures for examination and approval shall be formulated by the competent cultural relics administrative department of the State Council.

Article 18 The competent cultural relics administrative department shall, before examining and approving the repair plan and engineering design programme for a site protected for its

historical and cultural value, solicit opinions from the competent cultural relics administrative department of the people's government at the next higher level.

Article 19 The people's government of the province, autonomous region or municipality directly under the Central Government shall be responsible for investigating and handling the building or structure that threatens the safety of any major site protected for its historical and cultural value at the national level or damages its historical features.

The people's government verifying and announcing the site shall be responsible for investigating and handling the building or structure that threatens the safety of any site protected for its historical and cultural value at the provincial level, at the level of a city divided into districts, at the level of an autonomous prefecture or at the county level, or damages its historical features.

The people's government at the county level shall be responsible for investigating and handling the building or structure that threatens the safety of any immovable cultural relics that have not yet been verified and announced as a site protected for its historical and cultural value.

Chapter III Archaeological Excavations

Article 20 An institution applying to engage in archaeological excavations and to obtain a qualification certificate for archaeological excavations shall meet the following conditions:

(1) having four or more persons qualified as team leaders for archaeological excavations;

(2) having persons with a technical title in the profession of cultural relics and museology;

(3) having professionals for protecting the safety of cultural relics;

(4) having technical equipment for archaeological excavations;

(5) having facilities and premises for safeguarding the safety of cultural relics; and

(6) other condition as provided by laws and administrative regulations.

Article 21 To obtain a qualification certificate for archaeological excavations, an application therefor shall be submitted to the competent cultural relics administrative department of the State Council, which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue a qualification certificate for archaeological excavations when making a decision of approval, or notify the party concerned in writing and give

the reasons therefor when making a decision of disapproval.

Article 22 A system of responsibility of team leaders shall be practised in all archaeological excavation projects. A person who is to hold the position of team leader shall obtain a qualification certificate for team leader for archaeological excavations issued by the competent cultural relics administrative department of the State Council in accordance with the relevant provisions of the State.

Article 23 The archaeological investigation, prospecting and excavation to be carried out along with a construction project shall be organized and conducted by the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government. The archaeological investigation, prospecting and excavation in a construction project covering two or more provinces, autonomous regions and municipalities directly under the Central Government shall be jointly organized and conducted by the competent cultural relics administrative departments of the people's governments of the provinces, autonomous regions and municipalities directly under the Central Government where the construction project is located, whereas the archaeological investigation, prospecting and excavation in a construction project of special importance shall be organized and conducted by the competent cultural relics administrative department of the State Council.

The construction unit shall provide assistance to the archaeological investigation, prospecting and excavation carried out along with a construction project, and shall not hinder such archaeological investigation, prospecting and excavation.

Article 24 The competent cultural relics administrative department of the State Council shall make a decision of approval or disapproval within 30 working days from the date of receipt of an excavation plan as provided in the first paragraph of Article 30 of the Law on Protection of Cultural Relics, and shall issue a document of approval when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

In case of rescue excavation as provided in the second paragraph of Article 30 of the Law on Protection of Cultural Relics, the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government shall, within ten working days from the date of commencement of the

excavation, undergo the formalities of examination and approval retroactively with the competent cultural relics administrative department of the State Council.

Article 25 The range and rate of funds needed for archaeological investigation, prospecting and excavation shall be subject to the relevant provisions of the State.

Article 26 An institution engaged in archaeological excavations shall, within 30 working days from the date of completion of an archaeological excavation project, submit a project completion report to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government and the competent cultural relics administrative department of the State Council, and shall, within three years from the date of submission of the project completion report, submit an archaeological excavation report to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government and the competent cultural relics administrative department of the State Council.

Article 27 After submission of the archaeological excavation report, the institution engaged in archaeological excavations may retain a small amount of unearthed cultural relics as samples for scientific research, upon approval by the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government or the competent cultural relics administrative department of the State Council within their respective functions and powers, and shall, within six months from the date of submission of the excavation report, turn over other unearthed cultural relics for collection to the State-owned museums, libraries or other State-owned institutions for the collection of cultural relics designated by the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government or the competent cultural relics administrative department of the State Council.

Chapter IV Cultural Relics in the Collection of Cultural Institutions

Article 28 An institution for the collection of cultural relics shall set up a system of receipt, assessment, registration, cataloguing and filing of cultural relics in its collection, a system of

warehouse management, a system of entry, taking out and cancellation of cultural relics as well as their statistics and a system of maintenance, restoration and reproduction.

Article 29 The competent cultural relics administrative department of the people's government at the county level shall, in accordance with the relationship of administrative subordination, submit for the record the files for the cultural relics in the collection of various cultural institutions within its administrative area to the competent cultural relics administrative department of the people's government at the level of a city divided into districts or at the level of an autonomous prefecture or to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government; the competent cultural relics administrative department of the people's government at the level of a city divided into districts or at the level of an autonomous prefecture shall submit for the record the files for the cultural relics in the collection of various cultural institutions within its administrative area to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government; the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government shall submit for the record the files for the collected grade-one cultural relics within its administrative area to the competent cultural relics administrative department of the State Council.

Article 30 Where an institution for the collection of cultural relics borrows cultural relics from another institution, the borrower shall take necessary protection measures for the borrowed cultural relics so as to ensure their security.

Unless otherwise agreed upon by the parties concerned, the risk of destruction, loss or damage of the borrowed cultural relics shall be borne by the institution for the collection of cultural relics that borrows the said cultural relics.

Article 31 Where an institution for the collection of State-owned cultural relics fails to compile files for the cultural relics in its collection and submit such files to the competent cultural relics administrative department for the record pursuant to the provisions of Article 36 of the Law on Protection of Cultural Relics, it shall not exchange or lend cultural relics from its collection.

Article 32 Repairs, duplication or making rubbings of grade-two or grade-three cultural

relics in the collection of a cultural institution shall be reported for approval to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government. Repairs, duplication or making rubbings of grade-one cultural relics in the collection of a cultural institution shall, upon examination and verification by the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government, be reported to the competent cultural relics administrative department of the State Council for approval.

Article 33 An institution engaged in repairs, duplication or making rubbings of cultural relics in the collection of cultural institutions shall meet the following conditions:

(1) having persons with a technical title at or above the intermediate level in the profession of cultural relics and museology;

(2) having premises and technical equipment for repairs, duplication and making rubbings of cultural relics in the collection of cultural institutions; and

(3) other conditions as provided by laws and administrative regulations.

Article 34 To engage in repairs, duplication or making rubbings of cultural relics in the collection of cultural institutions, an application therefor shall be submitted to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government, which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue a qualification certificate of an appropriate grade when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

Article 35 Taking photos of grade-two or grade-three cultural relics in the collection of cultural institutions for producing publications or making sound or video recordings shall be reported for approval to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government. Taking photos of grade-one cultural relics in the collection of cultural institutions shall, upon examination and verification by the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality

directly under the Central Government, be reported to the competent cultural relics administrative department of the State Council for approval.

Article 36 Where the cultural relics in the collection of a cultural institution are stolen, robbed or missing, the institution for the collection of the said cultural relics shall report the case to the public security organ without delay, and, at the same time, report the case to the competent cultural relics administrative department; the competent cultural relics administrative department shall, within 24 hours after the receipt of the report from the institution for the collection of the said cultural relics, report the relevant situations to the competent cultural relics administrative department of the State Council.

Article 37 The State organs and State-owned enterprises, institutions or other organizations that collect or preserve State-owned cultural relics shall fulfil the following obligations:

(1) to set up a file system for the cultural relics in their collection and submit the files for the cultural relics for the record to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government in the place where they are located;

(2) to set up and improve an administrative system for the maintenance and repair of the cultural relics in their collection so as to ensure the security of the cultural relics; and

(3) where the cultural relics in their collection are stolen, robbed or missing, they shall report the case to the public security organ without delay, and, at the same time, report the case to the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government in the place where they are located.

Chapter V Cultural Relics in People's Collection

Article 38 Citizens, legal persons and other organizations, except institutions for the collection of cultural relics, may collect cultural relics in accordance with law, and the ownership of their cultural relics legally collected shall be protected by law.

Citizens, legal persons and other organizations that legally collect cultural relics may request the competent cultural relics administrative department to provide them with consultancy services

concerning assessment, repair and preservation of the cultural relics collected by them.

Article 39 A cultural relics store to be established shall meet the following conditions:

(1) having a registered capital of 2,000,000 yuan or more;

(2) having five or more persons with a technical title at or above the intermediate level in the profession of cultural relics and museology;

(3) having premises, facilities and technical resources for the preservation of cultural relics; and

(4) other conditions as provided by laws and administrative regulations.

Article 40 To establish a cultural relics store, an application therefor shall, in accordance with the provisions of the competent cultural relics administrative department of the State Council, be submitted to the competent cultural relics administrative department of the people's government at or above the level of the province, autonomous region or municipality directly under the Central Government, which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue a document of approval when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

Article 41 Where an auction enterprise established in accordance with law engages in auction of cultural relics, it shall have five or more professional cultural relics auctioneers with a senior technical title in the profession of cultural relics and museology, and shall obtain the licence for auction of cultural relics issued by the competent cultural relics administrative department of the State Council.

Article 42 To apply to obtain the licence for auction of cultural relics, an auction enterprise established in accordance with law shall submit an application therefor to the competent cultural relics administrative department of the State Council, which shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue the licence for auction of cultural relics when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

Article 43 Where an cultural relics store purchases or sells a cultural relic, or an auction enterprise engaged in auction of cultural relics sells a cultural relic by auction, it shall record the name, picture and origin of each cultural relic, the name or designation, residence, number of the

valid identification document/certificate of the seller, client and buyer of each cultural relic as well as the transaction price of each deal, and report all of them for the record to the competent cultural relics administrative department that has approved the sale or auction of the cultural relic. The competent cultural relics administrative department that receives the record shall keep confidentiality for them in accordance with law and keep that record for 75 years.

The competent cultural relics administrative department shall enhance its supervision and inspection over cultural relics stores and auction enterprises engaged in auction of cultural relics.

Chapter VI Taking or Brining Cultural Relics out of or into China

Article 44 An examination and verification authority for the entry and exit of cultural relics designated by the competent cultural relics administrative department of the State Council shall be staffed with five or more full-time responsible assessors for the entry and exit of cultural relics. A full-time responsible assessor for the entry and exit of cultural relics shall acquire a technical title at or above the intermediate level in the profession of cultural relics and museology and shall be subject to and pass the examination of the competent cultural relics administrative department of the State Council.

Article 45 Where cultural relics are to be transported, mailed or carried out of the country, the matter shall be reported in accordance with law to the examination and verification authority for the entry and exit of cultural relics for examination and verification before the cultural relics are taken out of the country. The examination and verification authority for the entry and exit of cultural relics shall, within 15 working days from the date of receipt of the application, make a decision on whether the cultural relics are permitted to be taken out of the country.

When the examination and verification authority for the entry and exit of cultural relics examines and verifies cultural relics, there shall be three or more professional technicians in cultural relics and museology who participate in the examination and verification, and at least two of them shall be the responsible assessors for the entry and exit of cultural relics.

The opinion on examination and verification for the exit of cultural relics shall be jointly signed by the responsible assessors for the entry and exit of cultural relics; unless the responsible assessors for the entry and exit of cultural relics unanimously agree that the cultural relics are

permitted to be taken out of the country, the examination and verification authority for the entry and exit of cultural relics may not make a decision to permit the cultural relics to be taken out of the country.

The criteria of examination and verification for the exit of cultural relics shall be worked out by the competent cultural relics administrative department of the State Council.

Article 46 The examination and verification authority for the entry and exit of cultural relics shall register the name, quality and texture, size and grade of the cultural relics under its examination and verification for the entry into or exit from the country, and the name or designation, residence, number of the valid identification document/certificate of the party concerned as well as the ports of entry and exit, the destination of the cultural relics, the date of examination and verification and other particulars.

Article 47 Cultural relics that are permitted to be taken out of the country upon examination and verification shall be granted an exit permit by the competent cultural relics administrative department of the State Council, and be marked with an exit label by the examination and verification authority for the entry and exit of cultural relics. Cultural relics permitted to be taken out of the country upon examination and verification shall be shipped out of the country at the port designated by the competent cultural relics administrative department of the State Council. The Customs shall let the cultural relics leave the country on the strength of their exit permit after the inspection of the exit label.

Cultural relics that are not permitted to be taken out of the country upon examination and verification shall be returned to the party concerned by the examination and verification authority for the entry and exit of cultural relics.

Article 48 Where cultural relics are to be taken out of the country for exhibition, the unit organizing the exhibition shall, six months before the exhibition, submit an application therefor to the competent cultural relics administrative department of the State Council. The competent cultural relics administrative department of the State Council shall make a decision of approval or disapproval within 30 working days from the date of receipt of the application, and shall issue a document of approval when making a decision of approval, or notify the party concerned in writing and give the reasons therefor when making a decision of disapproval.

It shall be reported to the State Council for approval if there are more than 120 pieces (sets)

of grade-one cultural relics to be exhibited or the number of grade-one cultural relics to be exhibited takes up 20 percent of the total exhibits.

Article 49 The only existing or fragile relics among the grade-one cultural relics are prohibited from being taken out of the country for exhibition. The catalogue of cultural relics prohibited from being taken out of the country for exhibition shall be made public on a regular basis by the competent cultural relics administrative department of the State Council.

Cultural relics that have never been officially exhibited within the country shall not be taken out of the country for exhibition.

Article 50 The duration for the exhibition of cultural relics out of the country shall not be longer than one year. The duration may, due to special purposes, be extended upon approval by the original examination and approval authority. However, the extension shall not be longer than one year.

Article 51 Where there exists the possibility of jeopardizing the security of the cultural relics being exhibited during the exhibition out of the country, the original examination and approval authority may decide to suspend or cancel the exhibition.

Article 52 Cultural relics temporarily entering the country shall be sealed by the Customs before they are turned over to the party concerned, who shall present them to the examination and verification authority for the entry and exit of cultural relics for examination, verification and registration. Upon examining the seals of the Customs and making sure that they remain intact, the examination and verification authority for the entry and exit of cultural relics shall mark each piece of cultural relics temporarily entering the country with a temporary entry label, and register and take photos of them.

When the cultural relics temporarily entering the country leave the country, the examination and verification authority for the entry and exit of cultural relics that has examined, verified and registered the said cultural relics shall check against the entry register and photos, and mark them with exit labels after examining the temporary entry labels and making sure that they are correct, and the competent cultural relics administrative department of the State Council shall grant an exit permit thereto.

Where, without going through the formalities as provided in the first paragraph of this Article, the cultural relics temporarily entering the country leave the country, the matter shall be dealt with

in accordance with the provisions of this Chapter on exit of cultural relics.

Article 53 No unit or individual may, without approval, remove, replace, misappropriate or damage exit labels and temporary entry labels for cultural relics.

Chapter VII Legal Liability

Article 54 Where, in violation of the provisions of these Regulations, public security organs, departments for industry and commerce, cultural relics administrative departments, the Customs, departments for urban and rural planning and construction and other relevant departments, and their staff members as well, abuse the power of examination and approval, fail to perform their duties or fail to investigate and deal with illegal acts upon discovery, the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law; if a crime is constituted, criminal liability shall be investigated in accordance with law.

Article 55 Where, in violation of the provisions of these Regulations, anyone undertakes the repair, removal or reconstruction of a site protected for its historical and cultural value without obtaining a qualification certificate of an appropriate grade for projects designed to protect cultural relics, it shall be ordered by the competent cultural relics administrative department to make corrections within a specified time limit; if it fails to make corrections within the specified time limit, or causes serious consequences, a fine of not less than 50,000 yuan but not more than 500,000 yuan shall be imposed; if a crime is constituted, criminal liability shall be investigated in accordance with law.

Where, in violation of the provisions of these Regulations, anyone undertakes the repair, removal or reconstruction of a site protected for its historical and cultural value, in which construction activities are involved, without obtaining a qualification certificate of an appropriate grade issued by the competent construction administrative department, it shall be penalized by the competent construction administrative department in accordance with the relevant provisions of laws and administrative regulations.

Article 56 Where, in violation of the provisions of these Regulations, anyone engages in repairs, duplication, or making rubbings of cultural relics in the collection of cultural institutions without obtaining a qualification certificate, it shall be ordered by the competent cultural relics

administrative department to cease its illegal activities; its illegal gains and the tools and equipment specially used for illegal activities shall be confiscated; if serious consequences are caused, a fine of not less than 10,000 yuan but not more than 100,000 yuan shall be imposed; if a crime is constituted, criminal liability shall be investigated in accordance with law.

Article 57 The amount of the fine as provided for in the second paragraph of Article 66 of the Law on Protection of Cultural Relics shall be not more than 200 yuan.

Article 58 Anyone who, in violation of the provisions of these Regulations, repairs, duplicates, makes rubbings of or takes photos of valuable cultural relics in the collection of cultural institutions without approval, shall be given a warning by the competent cultural relics administrative department; if serious consequences are caused, a fine of not less than 2,000 yuan but not more than 20,000 yuan shall be imposed; the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law.

Article 59 Where, in violation of the provisions of these Regulations, an archaeological excavation institution fails to submit a project completion report or an archaeological excavation report within the prescribed time limit, the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government or the competent cultural relics administrative department of the State Council shall order it to make corrections within a specified time limit; if it fails to make corrections within the specified time limit, the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law.

Article 60 Where, in violation of the provisions of these Regulations, an archaeological excavation institution fails to transfer cultural relics within the prescribed time limit, the competent cultural relics administrative department of the people's government of the province, autonomous region or municipality directly under the Central Government or the competent cultural relics administrative department of the State Council shall order it to make corrections within a specified time limit; if it fails to make corrections within the specified time limit, or causes serious consequences, the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law.

Article 61 Where, in violation of the provisions of these Regulations, the exhibition of cultural relics out of the country exceeds the duration for exhibition, the competent cultural relics

administrative department of the State Council shall order corrections to be made within a specified time limit; the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law.

Article 62 Where, in accordance with the provisions of Article 66 or Article 73 of the Law on Protection of Cultural Relics, a unit has its licence revoked due to an administrative penalty imposed thereupon, it shall go through the formalities of alteration registration or cancellation registration in accordance with law with the administrative department for industry and commerce; if it fails to go through the formalities within the specified time limit, the administrative department for industry and commerce shall revoke its business licence.

Article 63 Where, in violation of the provisions of these regulations, incomes earned by the undertaking of the State-owned museums, memorial halls, sites protected for their historical and cultural value, etc. are diverted for other purposes, the persons directly in charge and the other persons directly responsible shall be given administrative sanctions in accordance with law; if a crime is constituted, criminal liability shall be investigated in accordance with law.

Chapter VIII Supplementary Provision

Article 64 These Regulations shall be effective as of July 1, 2003.

Appendix VI

Regulations of Shanghai Municipality on the Protection of the Areas with Historical Cultural Features and the Excellent Historical Buildings

Regulations of Shanghai Municipality on the Protection of the Areas with Historical Cultural Features and the Excellent Historical Buildings

(Adopted at the 41st session of the Standing Committee of the 11th Shanghai Municipal People's Congress on July 25, 2002)

Chapter I General Provisions

Article 1

With a view to strengthening the protection of this Municipality's areas with historical cultural features and the excellent historical buildings, and promoting the coordinated development of urban construction and social culture, these Regulations are formulated according to relevant laws and administrative rules and regulations and in the light of the actual circumstances of this Municipality.

Article 2

These Regulations apply to the determination and management of protection of areas with historical cultural features and excellent historical buildings within this Municipality's administrative areas.

The management of protection of excellent historical buildings defined as cultural relics according to law shall follow relevant provisions of laws and regulations governing the protection of cultural relics.

Article 3

The municipal administrative department of planning is responsible for the administration of planning of the protection of this Municipality's areas with historical cultural features and excellent historical buildings. The district and country planning administrative departments are responsible for the administration of planning of the protection of areas with historical cultural features within their respective administrative areas according to relevant provisions of these Regulations.

The municipal administrative department of housing and land is responsible for the protection of this Municipality's excellent historical buildings. The district and county administrative departments of housing and land are responsible for the routine administration of protection of excellent historical buildings within their respective administrative areas, according to relevant provisions of these Regulations.

This Municipality's other relevant administrative departments shall, according to their respective functions and duties, cooperate in implementing these Regulations.

Article 4

The protection of areas featuring historical culture and excellent historical buildings shall follow the principles of unified planning, classified management, effective protection, rational utilization and subordination of utilization to protection.

Article 5

The municipal, district and county people's governments have the responsibility for protecting areas featuring historical culture and excellent historical buildings within their respective administrative areas and shall provide necessary policy guarantee and support of funds.

The owners and users of the excellent historical buildings shall shoulder protection responsibility according to the provisions of these Regulations.

All units and individual persons have the obligation to protect areas with historical cultural features and excellent historical buildings, and may report against the acts that endanger the areas with historical cultural features and excellent historical buildings to the administrative department of planning or the administrative department of housing and land. The administrative department of planning or the administrative department of housing and land shall timely investigate and handle the acts that endanger the areas with historical cultural features and excellent historical buildings.

Article 6

The funds for the protection of areas with historical cultural features and excellent historical buildings shall be raised through multiple channels.

The municipality, district and county shall establish special funds for the protection of areas with historical cultural features and excellent historical buildings, and the sources of the funds shall be:

(1) Funds arranged by the municipal, district and county financial budgets;

(2) Donations from units, individual persons or other organizations at home and abroad;

(3) Proceeds from transfer and lease of publicly-owned excellent historical buildings;

(4) Other funds raised according to law.

The municipal, district and county people's governments shall respectively set up special accounts for the special funds for the protection of areas with historical cultural features and excellent historical buildings, and the funds shall be earmarked for specified use under the supervision of the finance and audit departments.

Article 7

A specialists committee shall be established for the protection of the areas with historical cultural features and excellent historical buildings in this Municipality.

The specialists committee for the protection of the areas with historical cultural features and excellent historical buildings (hereinafter referred to as the specialists committee) shall, according to the provisions of these Regulations, take charge of the examination and appraisal involving affirmation, adjustment, cancellation and other relevant matters of the areas with historical cultural features and excellent historical buildings, providing consultative suggestions for decision-making by the Municipal People's Government. The specialists committee shall be composed of personnels from sectors of planning, housing and land, architecture, cultural relics, history, culture, society and

economy, and its specific composition methods and working rules shall be formulated by the Municipal People's Government.

Chapter II Determination of the Areas with Historical Cultural Features and the Excellent Historical Buildings

Article 8

An area with a complex of historical buildings whose architectural styles, space patterns and street landscape feature Shanghai's regional culture in a certain historical period in a comparatively complete manner may be defined as an area with historical cultural features.

Article 9

A building more than 30 years old and with one of the following conditions may be defined as an excellent historical building:

(1) The architectural styles, construction techniques and construction technologies contain features of architectural art and value of scientific research;

(2) Reflecting historical cultural features of Shanghai's regional architecture;

(3) Representative works of renowned architects;

(4) Workshops, stores, factory buildings and warehouses that are representative in history of our country's industrial development;

(5) Other excellent historical buildings that have a historical cultural significance.

Article 10

The owner and user of a building and any other unit and individual person may recommend an area with historical cultural features or an excellent historical building to the municipal administrative department of planning or the municipal administrative department of housing and land.

The municipal administrative department of planning shall, after studying, put forward a preliminary list of areas with historical cultural features and solicit opinions from the municipal administrative department of housing and land, the municipal administrative department of cultural relics and local district or county people's government. The list shall be examined and appraised by the specialists committee and then be submitted to the Municipal People's Government for approval and determination.

The municipal administrative department of planning and the municipal administrative department of housing and land shall, after studying, put forward a preliminary list of excellent historical buildings and solicit opinions from the municipal administrative department of cultural relics, the owners of the buildings and local district or country people's government; the list shall be examined and appraised by the specialists committee and then be submitted to the Municipal People's Government for approval and determination.

Before the approval and determination of the Municipal People's Government, the preliminary list of areas with historical cultural features and excellent historical buildings shall be made public to solicit social opinions.

Article 11

The Municipal People's Government shall publish the list of the approved and determined areas with historical cultural features, and the municipal administrative department of planning shall set up signs for these areas.

The Municipal People's Government shall publish the list of the approved and determined excellent historical buildings, and the municipal administrative department of housing and land shall set up signs for these buildings.

Article 12

A legally determined area with historical cultural features and an excellent historical building shall not be adjusted or cancelled without authorization. If there is a real need for adjustment or cancellation due to force majeure or change of circumstances, the adjustment or cancellation shall be proposed by the municipal administrative department of planning and the municipal administrative department of housing and land, and be submitted to the Municipal People's Government for approval after examination and appraisal by the specialists committee.

Article 13

In respect of any building found in urban construction to be of protective value but not yet defined as an excellent historical building, protective measures may be first taken by taking the relevant provisions of these Regulations as reference after initial determination of the municipal administrative department of planning and the municipal administrative department of housing and land, and then the procedure provided in Article 10 of these Regulations shall be followed to apply for approval to list the building as an excellent historical building.

Chapter III Protection of Areas with Historical Cultural Features

Article 14

The municipal administrative department of planning shall, according to overall city planning, organize the preparation of planning for protection of areas with historical cultural features, and solicit opinions from the municipal administrative department of housing and land, the municipal administrative department of cultural relics, local district or county people's government and relevant administrative departments, and submit the planning to the Municipal People's Government for approval after examination and appraisal of the specialists committee.

Article 15

The planning for protection of areas with historical cultural features shall include the following:

(1) The historical cultural features of the area and its norm of protection;

(2) The key scope of protection and scope of controlled construction area;

(3) The control and adjustment of the planning of land-use's nature of the area, and the requirements for the protection of space environment and landscape of the building;

(4) The renovation requirements for the buildings out of tune with historical cultural features of the area; and

(5) Other requirements and measures of planning administration.

Article 16

The construction activity conducted in the key scope of protection of an area with historical cultural features shall comply with the planning of protection of the area with historical cultural features and the following provisions:

(1) The block space pattern and the original elevation and color of buildings shall not be altered arbitrarily;

(2) Apart from auxiliary facilities of buildings that are really needed to be erected, no new construction or extension activity is allowed, and when the existing buildings are being reconstructed, their historical cultural features shall be maintained or restored;

(3) Without authorization, no new construction or extension of roads is allowed, and when the existing roads are being reconstructed, the original road pattern and landscape features shall be maintained or restored;

(4) No new industrial enterprise is allowed to be built, and the existing industrial enterprises that obstruct the protection of the areas with historical cultural features shall be removed in a planned manner.

Article 17

The construction activity conducted in the limits of controlled construction area with historical cultural features shall comply with the planning for protection of areas with historical cultural features and the following provisions:

(1) The buildings to be newly built, extended or reconstructed shall be in tune with the historical cultural features in terms of height, volume and color;

(2) When roads are being built, extended or reconstructed, the historical cultural features shall not be damaged;

(3) No industrial enterprise causing environmental pollution is allowed to be built, and the existing industrial enterprises causing environmental pollution shall be removed in a planned way.

If a building to be built or extended in the limits of controlled construction area with historical cultural features is restricted in terms of its building volume rate, the practice of compensation in another place may be made according to the city planning.

Article 18

The municipal administrative department of planning shall examine and approve the planning of the construction project in areas with historical cultural features. When making examination and approval, the municipal administrative department of planning shall solicit opinions from the municipal administrative department of housing and land.

Article 19

No arbitrary alteration of the nature of planned use of land in areas with historical cultural features is allowed. If the nature of use of buildings fails to comply with the requirements for the protection of areas with historical cultural features, it shall be restored or adjusted.

Article 20

The approved establishment of outdoor advertisements, signboards and other facilities in the area with historical cultural features shall comply with the requirements of planning of the protection of areas with historical cultural features and shall not damage the architectural space environment and landscape. The existing outdoor advertisements, signboards and other facilities that do not comply with the requirements for the protection of the areas with historical cultural features shall be demolished within a time limit.

Article 21

The fire-prevention facilities and passages in the area with historical cultural features shall respectively be perfected and cleared according to relevant technical norms. Where the required fire prevention standards cannot be reached due to the need to protect historical cultural features, the municipal administrative department of planning and the municipal public security fire department shall draw up appropriate fire prevention measures through consultation.

Chapter IV Protection of Excellent Historical Buildings

Article 22

The municipal administrative department of planning shall, jointly with the municipal administrative department of housing and land, propose the protection scope of an excellent historical building and the limits of peripheral construction control and, after soliciting opinions from relevant specialists and local district or county people's government, report to the Municipal People's Government for approval.

Article 23

No building shall be allowed to be built in the limits of peripheral construction control of an excellent historical building. Where there is an actual need to build auxiliary facilities for an excellent historical building, a report shall be submitted to the municipal administrative department of planning for examination and approval. When making examination and approval, the municipal administrative department of

planning shall solicit opinions from the municipal administrative department of housing and land.

Article 24

Any building that is to be built, extended, or reconstructed in the limits of peripheral construction control of an excellent historical building shall be in tune with the excellent historical building in terms of use nature, height, volume, elevation, materials and color. No original space landscape features around the building shall be changed, nor shall the normal use of the excellent historical building be affected.

If any building that is to be built, extended or reconstructed in the limits of peripheral construction control of an excellent historical building, a report must be submitted to the municipal administrative department of planning for examination and approval. When making examination and approval, the municipal administrative department of planning shall solicit opinions from the municipal administrative department of housing and land and the local district or county people's government.

Article 25

According to the historical, scientific and artistic value of the building and its extent of good condition, the requirements for protecting excellent historical buildings are divided into the following four categories:

(1) The elevation, structural system, plane layout and internal decoration of the building shall not be changed;

(2) The elevation, structural system, basic plane layout and internal decoration with characteristics of the building shall not be changed, but the other parts may be changed;

(3) The elevation and structural system of the building shall not be changed, but the internal parts of the building may be changed;

(4) The main elevation of the building shall not be changed, but the other parts may be changed.

The municipal administrative department of housing and land shall, jointly with the municipal administrative department of planning, propose the specific requirements for protecting excellent historical buildings at each place, and after appraisal by the specialists committee, report to the Municipal People's Government for approval.

Article 26

The municipal, district and county administrative department of housing and land shall do well in the guidance and service work for the protection of excellent historical buildings. The district and county administrative departments of housing and land shall notify the owners of the buildings and relevant property management units in writing of the specific protection requirements of excellent historical buildings, and clarify the protection obligations they shall undertake.

If an excellent historical building is transferred or leased, the transferor or lessor shall notify the transferee or lessee of relevant protection requirements in writing. The transferee and lessee shall undertake corresponding protection obligations.

Article 27

The municipal administrative department of housing and land shall organize the district and county administrative departments of housing and land to regularly conduct general check-ups on the use and protection of excellent historical buildings, and set up special files. The results of general check-up shall be notified in writing to the owners, users and related property management units of these buildings.

The owner and user of an excellent historical building shall cooperate in general check-up of the building.

Article 28

The establishment of outdoor advertisements, signboards and other facilities on excellent historical buildings shall be put under strict control. The authorized establishment of outdoor advertisements, signboards, air-conditioners, neon lights, floodlights and other outer facilities on excellent historical buildings, or the reconstruction of sanitation, drainage, elevators and other internal facilities shall comply with the specific protection requirements of these buildings. The establishment of outer facilities shall also be in tune with the architectural elevation.

Article 29

The owner and user of an excellent historical building shall not stack inflammables, explosives and corrosives in the building, and shall not conduct any activity that damages the load bearing structure of the building's principal part, or other activities that endanger the building's safety.

Article 30

The use nature and use function of internal design of an excellent historical building shall not be changed arbitrarily.

If the owner of an excellent historical building, actually needs to change the use nature and use function of the internal design according to the specific protection requirements of the building, he/she shall submit the plan to the municipal administrative department of housing and land for examination and approval. The municipal administrative department of housing and land shall solicit the opinions of the specialists committee before granting approval. If any change involves the use nature authorized by the construction project-planning license, consent shall be sought from the municipal administrative department of planning.

Article 31

Where the present condition of using an excellent historical building does not conform with the building's use nature and use function of internal design, and therefore cause harmful impact on the protection of the building, the owner of the building may, according to the building's specific protection requirements, make a scheme for restoring or adjusting the building's use nature and use function of internal design, and submit the scheme to the municipal administrative department of housing and land for examination and approval. The municipal administrative department of housing and land shall solicit the opinions of the specialists committee before granting approval. In

case of involvement to planning management, consent shall be sought from the municipal administrative department of planning.

Where the present condition of using an excellent historical building does not conform with the building's use nature and use function of internal design, and causes serious impact on the protection of the building, the municipal administrative department of housing and land shall, after soliciting opinions of the specialists committee, make a decision on the restoration or adjustment of the building's use nature and use function of internal design.

Article 32

If a publicly-owned excellent historical building, which is rented out according to the rent standards set by the government, needs to have its use nature and use function of internal design restored, adjusted or changed for protection, and its tenant really has to move out and discharge the tenancy agreement, the lessor shall resettle the tenant with compensation. The compensation for resettlement shall be above the standards of compensation for this Municipality's housing demolition and resettlement. The Municipal People's Government may, according to the category, location, use and other factors of the excellent historical building, draw up directive standards for resettlement compensation. The specific amount of resettlement compensation shall be determined by the lessor and lessee through consultation and according to the directive standards and the principle of reasonableness and appropriateness. If consultation fails, the local district or county people's government shall give a ruling after the party concerned makes an application. The party concerned, if disagreeing with the ruling, may bring a lawsuit before the people's court according to law.

If an excellent historical building, which is rented out according to market rent standards, needs to have its use nature and use function of internal design restored, adjusted or changed for protection, and make the original tenancy contract unable to be performed, the tenancy relationship shall be handled as stipulated in the original tenancy contract. If there is no arrangement, the lessor shall notify in writing, three months in advance, the lessee of the discharge of tenancy contract, and shall bear corresponding civil liability according to law.

If the excellent historical building is still for rent after the restoration, adjustment or modification of its use nature and use function of internal design, the original lessee shall enjoy the priority of tenancy right under the same condition. If the building is for sale, the original lessee shall enjoy preemption under the same condition.

Article 33

The owner of an excellent historical building shall, according to the building's specific protection requirements or requirements put forward in general check-up, timely refurbish the building and the user of the building shall give cooperation, and the district or county administrative department of housing and land shall supervise and urge and give guidance.

The owner of an excellent historical building shall be responsible for the repairs and maintenance, and bear the corresponding expenses. Where there are other stipulations between the owner and the user, such stipulations shall prevail. If the owner of the building really has difficulty in bearing repair expenses, he/she may apply to the district

or county people's government for appropriate subsidies paid out of the special funds for protection.

The lessee of an publicly-owned, non-residential excellent historical building rented out according to the rent standards set by the government shall bear partial repair expenses in the proportion of difference between government-set rent standards and market rent standards.

Article 34

If the owner of an excellent historical building fails to make timely repairs according to the specific protection requirements of the building so that the building is damaged or endangered, or fails to regularly refurbish the building's elevation, the district or county administrative department of housing and land shall order the owner to make rush repairs or refurbishment within a time limit. If the owner still fails to do so after the deadline, the district or country administrative department of housing and land shall entrust the specialized unit determined through public bidding to make the repairs or refurbishment on behalf of the owner of the building, who shall bear the costs needed.

Article 35

The owner of an excellent historical building shall entrust specialized design and construction units with appropriate qualification to carry out the repairs on the building.

The owner of an excellent historical building shall submit the design and construction scheme for repairs to the municipal administrative department of housing and land beforehand. If any change involves the load-bearing structure of the building's principal part, an application shall be made to the municipal administrative department of planning for the construction project-planning permit. Before issuing the construction project-planning permit, the municipal administrative department of planning shall seek approval from the municipal administrative department of housing and land.

Article 36

The repairs on excellent historical buildings shall conform to the State and this Municipality's architectural technology norm and technical provisions governing repairs on excellent historical buildings. If the repairs on the building cannot be done according to the architectural technology norm, the municipal administrative department of housing and land shall organize relevant specialists and relevant administrative departments to coordinate in determining appropriate repair plans.

The technical provisions governing repairs on excellent historical buildings shall be proposed by the municipal administrative department of housing and land jointly with the municipal administrative department of planning and be determined after solicitation of opinions from relevant specialists and relevant administrative departments.

Article 37

The filing materials such as writings, drawings and pictures brought about by the building repair project with permission of the municipal administrative department of

planning shall be submitted timely to the municipal city construction archives by the owner of the excellent historical building.

Article 38

If an excellent historical building is in danger of destruction by force majeure or other effects, the owner of the building shall promptly organize rush repairs and protection, take reinforcement measures and report to the district or county administrative department of housing and land. The said administrative department shall supervise and urge and give guidance, and shall timely correct any measure that does not meet the building's specific protection requirements.

Article 39

The excellent historical building defined according to law shall not be removed or demolished without authorization. If an excellent historical building must be removed, demolished or duplicated due to special needs, such matters shall be jointly proposed by the municipal administrative department of planning and the municipal administrative department of housing and land and shall be reported to the Municipal People's Government for approval after examination and appraisal by the specialists committee.

During the process of implementation of the removal, demolition or duplication of an excellent historical building, the building's detailed mapping, information recording, and filing materials preservation work shall be done well, and such materials shall be timely submitted to the municipal city construction archives according to relevant provisions of this Municipality on management of files of completion of construction projects.

Chapter V Legal Liability

Article 40

Violators of the provision of these Regulations, who conducts construction activity arbitrarily or without meeting the approved requirements in the protection area of or limits of peripheral construction control with historical cultural features or of excellent historical buildings, shall be handled by the municipal administrative department of planning or the district/county administrative department of planning according to relevant provisions of the"Regulations of Shanghai Municipality on City Planning"and the"Provisions of Shanghai Municipality on Demolishing Illegal Buildings".

Article 41

Violators of the provision of these Regulations, who set up or reconstruct related facilities without meeting the buildings'specific protection requirements, or arbitrarily change the use nature or use function of internal design of excellent historical buildings, or conduct activities that endanger buildings'safety, shall be ordered by the municipal administrative department of housing and land or the district/county administrative department of housing and land to correct within a time limit, and may be cumulatively

penalized with a fine of between not less than 2 per cent and not more than 20 per cent of the rebuilding cost of the excellent historical building.

Article 42

Violators of the provision of these Regulations, who arbitrarily remove an excellent historical building, shall be ordered by the municipal administrative department of planning to correct within a time limit or to restore the building to its original state, and may be cumulatively penalized with a fine of one time to three times the rebuilding cost of the excellent historical building.

Violators of the provision of these Regulations, who arbitrarily demolish an excellent historical building, shall be ordered by the municipal administrative department of housing and land or the district/county administrative department of housing and land to correct within a time limit, or to restore the building to its original state, and may be cumulatively penalized with a fine of three times to five times the rebuilding cost of the excellent historical building.

Article 43

Violators of the provision of these Regulations, who repair an excellent historical building without meeting the building's specific protection requirements or relevant technical norms, shall be ordered by the municipal administrative department of housing and land or the district/county administrative department of housing and land to correct within a time limit, restore the building to its original state, and may be cumulatively penalized with a fine of between not less than 3 per cent and not more than 30 per cent of the rebuilding cost of the excellent historical building.

Article 44

Violators of the provision of these Regulations, who fail to timely submit filing materials of the excellent historical building's repair, removal, demolition or duplicate project, shall be ordered by the municipal administrative department of planning to submit these materials within a time limit. Any person who still fails to submit these materials after the deadline shall be handled according to relevant provisions of laws and regulations governing management of archives.

Article 45

The administrative department of planning, administrative department of housing and land and other related administrative departments and their working staff members who exercise their functions and powers in violation of the provisions of these Regulations in one of the following cases, shall be given administrative punishment according to law by their own unit or higher authorities. If economic losses are caused to the counterpart of their management, compensation shall be made according to relevant State provisions. If the act constitutes a crime, the wrongdoer shall be prosecuted for criminal liability according to law:

(1) Defining, adjusting or canceling an area with historical cultural features or an excellent historical building in violation of legal procedures or illegally approving the removal or demolition of an excellent historical building;

(2) Arbitrarily approving illegal construction activity to be conducted in the scope of protection of an area with historical cultural features or of an excellent historical building, or illegally approving the change of the use nature and use function of internal design of an excellent historical building;

(3) Failing to promptly handle illegal acts that do harm to an area with historical cultural features or an excellent historical building;

(4) Other acts of dereliction, power-abuse and malpractice for selfish ends

Article 46

The party concerned, if he disagrees with the specific administrative act made by an administrative department, may apply for administrative reconsideration or bring an administrative lawsuit according to the provisions of the"Law of the People's Republic of China on Administrative Reconsideration"and the"Law of Administrative Litigation of the People's Republic of China".

Chapter VI Supplementary Provisions

Article 47

The protection of renowned towns with historical culture defined by this Municipality's overall city planning shall take the provisions of these Regulations concerning the protection of areas with historical cultural features as reference.

Article 48

These Regulations shall become effective on January 1, 2003.

Appendix VII

A Description of the Acceptable Layout for the Shanghai Municipal Abattoir (Sawjin Road Abattoir)

(Shanghai Archives,archive NO.U1-14-2392, 1924-1935)

SANGIN ROAD ABATTOIR

A description of the accepted Layout "P" (as ¼ Scale Working Drawings)

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1. The Original Requirements

The requirements of the Public Health Department for Lairage and Slaughtering accommodation is as follows together with all requisite abattoir accessories and departments, quarters for Inspectors and Chinese Staff and Vaccine Animals.

	Lairage	Slaughtering at one time	Cooling
Oxen	500	20	300-400
Calves	100	6	100
Sheep	400	20	400
Pigs	50	6	100

Further requirements call for the provision of a future compliment of approximately double the above numbers, and in addition the provision of cold storage accommodation.

2. Layout "P"

This development is a scheme built up from a number of trial layouts and systems.

General Features of the Design - The above requirements have been met and the plan is based on the study and consideration of modern humane methods (adapted to Chinese cattle) and custom, in consultation with the Health Department's officers. An effort has been made to keep the system simple but disciplined so as to overcome possible irregularities. The layout is economical in cubic contents, land, handling, machinery and fittings and in staff supervision and control.

The abattoir is self-contained and complete, as regards disposal of manure and waste materials and, other than electric current, should require practically no outside working assistance.

After consideration of the few abattoirs in existence in other countries, it appears that many are out of date and that each deals with different [illegible]

to the Slaughter halls and with Chinese animals and methods, and the various classes of animals in these particular proportions, also the fact that the animals and butchers and products are not actually the Council's staff or property, but belong to private owners working under regulated supervision is a special feature.

The design divides all live stock and foul areas from finished products and clean areas. Cattle drivers and coolies are parted and catered for separately from butchers, dealers and their workmen. At the same time simple access is provided for business communication.

The Working Mechanism of the Abattoir.

3. Entrance for Animals

The entrance for animals has been placed to receive animals brought in from Yalu Road and North Station, as the chief direction of approach, is placed in Sawgin Road to clear the main Dixwell Road; the entrance gates recessed so that cattle wait clear of the Sawgin Road through traffic, pending the opening of the gates. The Chinese staff quarters are in close relation to these gates. Pigs brought in by wheel-barrows in crates, sometimes from other directions, can also enter by the Sawgin Road North-west Gates, if desired. A gatekeeper's box checks the entries at the gates.

4. Lairage Halls

Animals pass into the lairage compound without option of straying elsewhere and into the lairage halls, as designated, on the ground floor or by the inclined ramps to the upper floors.

Two ramps have been provided, one for oxen in the center of their lairage and the other for calves and sheep; the one also forming a relief fire escape to the other. As is customary in other countries, space for a cattle lift (6 oxen to a load) has been allowed for, with entrance and exit to opposite ends on all floors and also with recessed lift landings to accommodate one lift load of waiting animals, clear of the through balcony roads.

Within the lairage halls, the cattle are to be bedded on the modern Yoke system with fodder and water troughs and drainage channels, approached from central drive roads and supplied from shut off feed passages.

Sheep and calves and pigs are to be housed in pens with fodder and water provision.

The pig lairage and slaughter hall has been placed on the ground floor (with allowance for future extension) since they arrive in crates, and by wheel-barrow, and are unable to be taken up ramps; further it appears the coolie objects to parting from his barrow and separation from his pigs. The use of caged hoists or special lift for this purpose has been ruled out as too complicated and expensive.

5. Sick Oxen

A sick lairage has been placed on the ground floor so situated that the removal of animals from the main halls is in the direction away from incoming animals.

6. Fodder Boxes and Food Boilers

In accord with past custom, small fodder boxes for hire by the registered cattle owners have been provided on the ground and third floors, placed for easy filling from the compound roads and near the lairage doors.

Boilers for heating the water for the fodder are located centrally in the lairage, near the steps up and down between floors.

7. Lairage Men's Rest Room

To confine individual activities, a room with tea stove, etc., is located centrally near the main ramp and staircase.

Small latrines have been conveniently placed on each floor.

8. Awaiting Slaughter Lairs

When the animals have been in lairage for the prescribed supervisionary period (24 to 48 hours) they are led, as required, to the awaiting slaughter pens, placed on the inner balcony roads as near as practical and opposite to their lairage doors.

These pens have been designed to hold from 3 to 4 oxen (and other animals in proportion) or approximately one hour's slaughtering.

As the animals are required for slaughter, they can be led or driven from these pens into the slaughter boxes. The bridge approaches are designed to give free passage for one animal only, but of insufficient width for it to turn back. On approaching the slaughter box the animal has no impediment and no option but to pass into it. The cattle-man, leading or driving, can pass clear by a small door, hidden from the animal's view and too narrow for him to follow, placed just before the slaughter box entrance. He can then shut the gate after the animal has entered the box.

The driver and butcher can pass back to the lairage road, by gates too narrow for animals, without passing through the awaiting pens or slaughter boxes.

9. Slaughter Boxes

These have been designed to operate on modern methods. The animal contained within the slaughter box remains screened from all view of the slaughter floors. The slaughterer mounts his platform at the opposite end of the box facing the animal's head and, without danger, stuns or shoots it. The slaughterer then, by means of a lever, releases the box, the bottom lowers and the side next to the slaughter floor lifts, and the stunned animal is slid into position on the floor.

The box is so counter-balanced that it returns to its ready position and is locked as soon as the weight of the animal is discharged, and the next beast can then be driven in.

10. The Slaughter Hall

The stunned animal from the tilting slaughter box is ejected in position on the bleeding space of the slaughter floor and is then bled by the butcher, the blood being drained into a special pail set in the floor.

The carcase is then partly dressed and the stomach and parts removed; it is then lifted into a vertical position by means of an electric hoist, is transferred to a gamble with pulley runner onto the overhead conveyor rail. The carcase is thus moved some 8 ft. further within the slaughter hall where the dressing is completed. This movement prepares the bleeding floor to receive the next animal ejected by the slaughter box.

The width of the slaughter hall (opposite each box) is designed to accommodate three carcases being dressed in the vertical position and one being bled at the same time. This permits of four to six animals passing each slaughterer in one hour at a comfortable working speed.

Number 16 slaughter boxes for oxen have been provided on each (of the two) slaughtering floors.

The calves are slaughtered more simply, without the aid of the slaughter box; these animals not being dangerous to handle.

The sheep are slaughtered in half blinded pens on special cradles as in common practice.

11. Passage of the Carcases and Offal

The dressed carcase, hanging upon the pulley runner on the overhead conveyor rail, is prevented from touching the floor and is transferred along the conveyor rail over a bridge clear of the slaughter hall. The planning converges all carcases in the one direction by the shortest route to the waiting space, opposite the Inspector's box and weighing machines.

The offal, comprising the hide, containing the stomach, the head, tail, etc., passed to rear of the slaughter hall where shutes are positioned, discharging into the offal rooms on the ground floor under.

The drainage of the slaughter hall floor endeavours to drain off all blood and water and prevent the hides becoming saturated.

12. The Inspector's Box

This office is so positioned that all dressed carcases (excepting pigs) must pass it. The weighing machines, one for oxen and the other for sheep and calves, are in front and can be read from within. The floor is elevated to give a view over the carcases on the rails, to most of the slaughter floors and especially the "Special Kill" slaughter boxes. Direction of the cooling hall can also be given and the passage to the sections watched; the "Awaiting Further Inspection" room is under direct observation and also the "Rejected Carcases" room and lowering hoist for such carcases.

The pig cooling hall is also within easy access of the Inspector's box, while the required isolation of the piggery sections has been observed, as far as is practical, with the concentrated planning.

13. The Cooling Hall

The cooling hall is divided to receive the various animal carcases and are divisioned into sections by the conveyor rails, automatically adjusting the stamping and registration and endeavours to prevent irregular moving of cooling carcases.

Doubtful carcases passing the Inspector's box can be directed to the special hall for further inspection and, if rejected, can be lowered, without approaching the main hall, to the ground floor near the digestor or incinerator

14. Loading and Removal of Finished Carcases

The carcases on their conveyor rails pass onwards across the cooling halls and when ready for discharge, can be run out onto the loading balcony and laterally to the loading hoists.

Four loading towers have been provided, two for oxen, one for calves and sheep and one for pigs (and sheep). They are fitted with one hoist each to serve the two cooling floors and also the cold storage floor over.

Provision has been made in the design against carcasses from an upper floor being lowered upon operators on the lower floors.

Provision has been secured against improper exit of carcases from the cooling halls, (other than by the hoists, the gates of which can be locked) by making the one staircase from the ground floor to the loading road too narrow for man-handling. The inter-floor upper staircases, however, are suitable for man-handled carcases.

Simple mechanism has been arranged to deal with the transfer of carcases from the pulley runners on the conveyor rails to the hoist hooks. Return conveyor rails for empty pulley runners have been provided to relieve congestion at the loading towers.

The loading towers have been so planned that motor lorries or carts can be drawn directly under them, either parked or ranked, with simple driving clearance, and the loading platforms facilitate detachment of lowered carcases from the hoists.

Carcases designated for cold storage on discharge from the cooling halls can pass up the same hoists to the top cold storage floor, where porch space has been allowed at the hoist heads for carcases to wait for the opening up the insulated doors.

15. <u>The Loading Road and Space</u>

Entrance for loading vehicles has been planned at the North-west gates and exit by the South-west, giving a through drive and an easy run out for loaded vehicles. The width of the loading road permits lorries to pass others backed under the loading towers and others ranked against the outer wall and also turning space for 2-ton trucks.

One watchman's box controls the animal entrance gates and loading road exit and another at the North-west entrance and the pig lairage extra entrance, but the North-west entrance can be seen from the South-west exit box if economy in staff is necessary.

The boundary walls are of sufficient height to obscure the view of the loading towers point of discharge at approximately first floor level from the public highway. The walls enclosing the site are placed at 11 ft. high for security.

The main entrance gates are blinded and inset with small wicket doors for man passage.

16. Offal Disposal (Oxen, Sheep and Calves)

The shutes from the slaughter halls are straight to allow the butcher-owner to watch delivery to his own representative in the offal rooms below, should he wish to escort his offal the centercore staircase is within 30 ft. of any shute.

On arrival of the offal, the stomach contents can be emptied down the sewer hoppers at the foot of each shute: the offal cleansed and hung upon the offal rails: the hides dragged to the raised hide floor and cleaned and then stacked on the low tables provided.

Those parts of the offal for treatment in the tripery can be man carried to the entrance within 50 ft. from any offal room door.

The hides and parts for sale to dealers can be weighed and removed by lorries and carts, entering by the left and circling the inner slaughter-section road passing in and out by the arched way from the loading road.

The refuse can be carried to the incinerator within 30 ft.

17. Tripery

This department is centrally placed to receive supplies from the offal room and from the pig slaughter hall. The internal process is arranged on a cycle with finished product discharge on the slaughter-section road.

It will be seen that all loading vehicles enter and exit by the same route contained within the slaughtering section.

18. The Pig Slaughter House

The piggery section has been specially shut off from the remainder by divisions across the buildings, leaving small doors and gangways only for connection for butchers and inspectors.

The pigs pass from their main lairage by an inclined passage to the "Awaiting Slaughter Pens" opposite each "Sticking Pen". As each pig is required, it is admitted to the "Sticking Pen" by an up-sliding counterbalanced door large enough to admit one pig only. When the pig has bled the front of the pen can be lowered, forming a tray for sliding the carcase into the scalding pan. One scalding pan is designed to serve two sticking pens owing to the time taken in bleeding and for steam economy.

When scalded and partly scraped the hoist lifts the carcase onto the scraping table and later on to the conveyor rail, where the offal is removed and placed upon the offal rails on either side. The hoist is also available for hauling heavy carcases from the sticking pen into the scalding pan.

The butchers' door between the awaiting slaughter and sticking pen is narrow and has a 14" step to prevent pigs being brought direct into the slaughtering section, without passing the sticking pen.

The carcase is then moved along the conveyor rail to the hoist, where it is lifted to the cooling hall on the first floor or carried up the staircase surrounding the hoist well.

The offal is removed by hand from the offal rails to the pig offal room at the South end of the hall, which has finished exit-doors onto the loading compound arched way.

The stomach manure can be emptied into the sewer-hopper designed in the recess entered in the North wall of the slaughter hall.

The offal for the tripery can be carried to that department within some 25 ft.

19. Pig Cooling Hall

— The arrangements for the pig [redacted] cooling, loading and cold storage conforms with that for all other carcases.

20. The Knackery

This department comes under the direct working of the Health Department. It is so placed that doubtful live stock can be removed to this slaughtering room directly from the lairage compound.

The exit also forms the entrance for carcases singled for post mortem examination from the slaughter compound.

After slaughter, the conveyor rails transport the carcase to the digester and bone-crusher adjoining, or to the cremator. For whole carcases dangerous to be opened, a trolley is sited to run from the exit to deliver directly into the cremator in the center-core building.

21. The Boiler Room

This room is positioned as centrally as possible at basement level in the cooling block. Steam supplies run in ducts to the pig scalding pans, the tripery, the digester and the butchers' bathrooms, kitchens, etc.

The boilers are proposed to be fed by oil burners and an oil storage tank is sited below ground in the loading road to be filled from inside or outside the compound. Supply pipes run to the boiler room burners and also to the cremator and incinerator.

22. The Center Core

The center core contains two furnaces, the cremator with special doors and trolley filler for whole carcases, and the incinerator for smaller continual refuse, with a hand chute feed and a drying hearth for wet straw set before the furnace grating. They are fed by oil burners.

The furnaces are drawn by a tall chimney, containing one flue for each furnace and a third vent [redacted] to carry away heat and fumes from the furnace room, (actuated by the heat of the furnace flues.)

This shaft is carried to a height above the other buildings, sufficient to clear the smoke and obtain sufficient draught.

23. The Offices

These are placed as near as possible to and between the animal entrance and loading exit, with the single staircase to the cooling hall just outside for control.

They contain a private office, a general office, a messroom, kitchen and lavatory accommodation, approached equally from the lairage and slaughter sections but self-contained from the freedom of both.

24. The Butchers Accommodation

The butchers have a dressing room fitted with lockers, a bathroom and latrine accommodation.

25. The Dealers' Room

To attract business this room has been inserted with a tea room and kitchen, jointly shared with the butchers, for conduct of necessary business arrangements. The staircase outside these rooms leads to the cooling rooms direct for business inspections, etc.

26. The Compound Areas

Communication gateways (with blinded gates) connect the compounds.

For cleansing purposes after the abattoir operating hours, these connections afford free circuits for traffic.

All compounds are planned to drive through without turning and the radius at all corners and turns is over 26 ft. between wheel-guide curbs, permitting 5-ton, 14 ft. x 6.7 in. x 23 ft. overall, vehicles to pass on less than full wheel lock.

Two-ton lorries have passing width at all points.

27. Cold Storage

The machinery hall has been placed as near as possible to the cooling block and the Chinese staff quarters within the "private compound", as the height and area required permits. The cold feed pipes are carried from the hall in an arched duct over the "private yard" entrance gates, then by enclosures up to the 3rd floor of the cooling block. The length of the hall is divided in four rooms for economy, should the hall not be filled at all times.

The insulation can made on any system within the concrete walls, floor and roof.

The position of the cold storage on the top floor permits of its addition being made as and when found necessary without affecting the abattoir.

28. The Superintendent's Quarters

These are designed for one married and two or three single men, sited on the South corner, dominating the main entrance and exit of the abattoir.

29. The Chinese Quarters

These are within the private yard and entered from within the abattoir. They are designed to take two married foremen, two married clerks, four married coolies and six single with kitchens, lavatories, washhouse, etc.

30. The Vaccine Animal Leirage

These rooms have been sited in an enclosed yard near the Chinese attendants' block away from the public abattoir compounds. The dogs being placed at some distance owing to their noise.

31. The Private Yards

The yard areas on the North and [illegible] sides of main buildings form the requisite lorry and truck parking spaces.

32. The Sanitation Arrangements

The lairage for oxen is fitted with manure troughs and owing to the enclosed buildings and comfortable standing and tethering methods, the absence of straw for beds permits of flushing these manure troughs into hoppers, with traps, into soil drain pipes.

The whole areas of floors are arranged for hosing down daily with water, also drained down these pipes. The lairage for other animals is based on the same principle. These down pipes deliver into sewer drains and lead to the public sewerage system.

Hard manure with possibly fodder stray mixed unable to pass the drainage trough gratings can be man-handled in special iron baskets to the manure shutes placed immediately outside each lairage door. These shafts discharge into special metal hand carts curbed in position on the compound under. These handcarts to be made to discharge into the incinerator or can be emptied into refuse carts and carted away, if so desired.

Under the shutes are sewer hoppers to take the discharge when flushing down the shutes. The shutes are carried up to the fourth floor roof level as vent shafts, to avoid foul odours and have hopper self-shut filling traps.

33. Daily Washing and Cleansing

All floors to be laid to drainage falls throughout and have water hosing points. Each hall has a cleaning coolie's store.

34. General Information

Animals laired on the ground and first floors will be slaughtered and cooled on the first floor. Animals laired on the third and fourth floor will be slaughtered on the second slaughter floor, approximately level with the fourth lairage floor.

The essential differences in the heights required for lairage and slaughter have made this arrangement possible with suitable concentration and structural economy. Repeated efforts to design for slaughtering at each lairage floor level have proved unpractical. Also leading up by ramps from each lairage floor level direct to the slaughter boxes would demand great excess in cube and cost and loss of light.

The circular plan of the slaughter hall affords, firstly economy in area after the stunned animal ejected on the killing floor space, occupying full lying width and clearance, is hoisted on to the conveyor rail, calling for less width, secondly the offal rooms, shutes, staircases and carcases removal, are drawn to a common center of disposal, etc., which cubic and transit curtailment, as compared with square planning, is considerable.

35. Proposed Method of Construction

The whole premises has been designed for construction by instalments, the first of which affords the accommodation required for immediate needs (and replacement of the existing old properties now in use).

The first construction to consist of the accommodation given under heading No.1 and comprise:-

Lairage blocks - 2 floors.

Slaughter block - 2 floors (offal floor and one slaughter floor).

Cooling block - 2 floors (offices and pig slaughter floor and one cooling floor).

Inspector's Quarters - one Inspector only.

Chinese staff quarters - 3 floors only (4 married, 6 single men).

Vaccine Animals, etc. - complete.

Roads, compounds and walls, etc. - complete.

The completion has been arranged for either one or two additions without undue overlapping of works and cost, provided of course, no structural deviation from the drawings is made.

Appendix VIII

City of Los Angeles's Suggestion for the Shanghai Municipal Abattoir

(Shanghai Archives,archive NO.U1-14-2392, 1924-1935)

COPY 00073

DEPARTMENT OF HEALTH
City of Los Angeles
U. S. A.

March 31, 1930.

Mr. JM JM,
Deputy Commissioner of
Public Health,
SHANGHAI MUNICIPAL COUNCIL,
Shanghai, China.

Dear Sir:

Please find enclosed instructions for the planning and construction of a Municipal Abattoir and trust this will be of benefit to you.

Respectfully yours,

(Sgd) William Veit, V.M.D.
City Veterinarian.

I. LOCATION OF SLAUGHTERHOUSES:

All slaughterhouses shall be located:
1. Where an adequate supply of pure water is available.
2. Where proper drainage is obtainable, and
3. Where proper disposal of all wastes can be accomplished without creating a nuisance.

II. GENERAL CONSTRUCTION:

All slaughterhouses must be enclosed on all sides, and all walls, ceilings, roofs, floors, doors, fly screens, drains, sewers, etc., must be kept in good repair.

III. GENERAL CLEANLINESS:

The whole premises, that is, the building, together with itscontents, the yards, pens, etc., must be kept in clean condition at all times. Rubbish must not be allowed to accumulate, and adequate measures must be taken to prevent the harboring and breeding of rats on the premises.

IV. LIGHT AND VENTILATION:

All rooms must have ample light and ventilation directly to the outside air. All doorways must be fitted with tightly fitting doors, either screen or solid, which must be kept closed at all times except when in actual use. All other openings must be covered with metal fly screen of not less than 14 mesh.

V. FLOORS:

Floors of all rooms where killing, handling, preparing or storing is done must be impervious and must be constructed of concrete, asphalt, or other non-absorbent material. All such floors must be coved and carried up the face of the wall to a sufficient height to prevent seepage under the floor. Also all such floors must be made with a pitch or fall of not less than one-fourth inch to the foot, and be directly connected with gutters, of the same material, which discharge through properly constructed traps into drain pipes leading to the sewer.

VI. SEWAGE DISPOSAL:

The premises must be connected with a municipal or other public sewer system if the same is available; otherwise a proper septic tank must be provided of such size as to hold at least two days' sewage. The effluent from this septic tank must be discharged either into properly constructed and tightly covered cesspool or cesspools or into a subsurfacing irrigation system. The cesspools or subsurface system must be of such capacity that no effluent is ever exposed above the ground or otherwise creates a nuisance.

VII. DISPOSAL OF BY-PRODUCTS:

Tanking, cooking, preparing and storing of material not intended for human food shall not be done in the same building where killing, preparing, handling, storing or cooking of material for human food is carried on. Exhaust pipes from cooking tanks must be so arranged as to efficiently dispose of all steam [illegible]

Paunch contents shall be finally disposed of at least every other day either for fertilizer by being spread over the ground in a layer not over four inches thick as far distant from human habitation and from the slaughterhouse as possible, or by being buried or burned.

Entrails, hoofs, heads, and other waste must be disposed of within 48 hours after slaughter. If used for hog feed this material must be cooked. Otherwise, it must be disposed of within this time by being tanked and burned or buried in such manner as not to create a nuisance.

However, bones, hoofs, horns and heads, after being cooked and cleaned, may be dried and stored not less than 50 feet away from the slaughterhouse.

Hides must be removed from the premises or salted down in the hide room within 24 hours after skinning.

There is an improved method of dry rendering by which the residue is used as a chicken feed and this method is very successful where used and with a minimum amount of odors. Information can be obtained through any of the large packing houses in Chicago.

VIII. KEEPING OF ANIMALS:

Animals must not be kept, fed, or permitted to roam within 100 feet of the slaughterhouse, except that animals intended for slaughter may be kept in slaughtering pens adjacent to the slaughterhouse for not exceeding 48 hours previous to being slaughtered.

IX. TOILET AND WASHING FACILITIES:

Each slaughterhouse must be provided with a toilet and with apartments for dressing and washing. All changing of clothing must be done in the apartments provided for that purpose, and under no circumstances may clothes be changed, hung or stored elsewhere in the slaughterhouse.

Apartments, as provided in this section, shall be separate from rooms where killing, handling, cooking, preparing or storing are carried on. Necessary plumbing therein must be provided and must be connected with the sewer.

Where a vault is the only available accommodation, it must be located at least fifty feet from the slaughterhouse, and the vault and building must each be fly tight.

X. KILLING ROOM:

Side walls must be covered with galvanized iron, cement or other non-absorbent material, to a height of not less than five feet above the floor; above this height the walls and ceiling must be of smooth construction and shall be painted or lime washed.

An adequate supply of pure clean water shall be provided in this room. Paunches, entrails and their contents upon removal from each carcase must be placed in

covered metal or metal-lined receptacles, and the floor shall be kept as clean as possible during slaughtering. Hides, heads, hoofs, etc., must be removed from the killing room at the end of each day's slaughtering.

Carcases of animals and parts therefrom intended for human food must not be allowed to come in contact with the floor.

Carcases of animals intended for human food must be either removed from the premises or placed in a cooling room within one-half hour after being dressed.

Condemned parts of carcases must be removed from the killing room at once and tanked or burned within the next 48 hours, and all tools, utensils, containers, floors, hands, etc., which may have come in contact with the diseased parts must be thoroughly washed and cleaned before the next animal is slaughtered.

All tools, utensils, blocks, containers, walls and floor must be thoroughly washed and cleaned after each day's work.

A knocking pen must be provided, the same to have a solid door swinging inward toward the killing room floor.

The use of the killing room for any purpose other than for the slaughtering of beeves, sheep and calves intended for human food is strictly prohibited.

XI. COOLING ROOM:

The walls and ceiling of the cooling room must be of tight T & G construction and must be painted or oiled. This room must be entirely separated from all other rooms in the slaughterhouse except for doorways leading to a shipping platform and to the killing room. These doorways must be fitted with solid tightly fitting doors which must be kept closed at all times except when in actual use.

The walls, ceiling, floors, doors, hooks, etc., in this room must be kept in clean condition and the use of this room for any purpose other than for the temporary storage of dressed carcases intended for human food is prohibited.

XII. HOG SCALDING AND SCRAPING:

The scalding and scraping of hogs must be done in a room entirely separated from the main killing room. A doorway, with a solid tight fitting door, which shall be kept closed at all times except when in actual use, may be installed between these two rooms. This room and all slaughtering and dressing done therein shall conform to the requirements of the main killing room. (Sec. X)

Where hog sticking platforms are used the same shall be constructed of non-absorbent material, properly drained and connected with a sewer system.

XIII. HIDE ROOM:

The hide room must be tightly partitioned off from the other rooms of the slaughterhouse except there may be doorways to a shipping platform and to the killing room. These doorways must be fitted with solid, eight-fitting doors which must be kept closed at all times except when in actual use. The floor and walls of this room up to a height of at least six inches above the maximum pile of hides must be solid concrete construction, the floor must be sloped and connected with the sewer.

XIV. CORRALS AND HOG PENS:

Water troughs in corrals must be so built or arranged as to permit of no overflow.

A tight floored feeding platform, preferably of concrete, must be provided in the hog pens. Pens and corrals must be so drained that no accumulation of water may occur therein.

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