

# *Protection and Development Strategies of Third-line Construction Urban Heritage Value under the Background of Urban Renewal—Taking Renhe street Community in Panzhihua as an Example*

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**Abstract:** Under the background of urban renewal, urban space is transformed from incremental space to stock space. As one of the types of low-efficiency stock space, shanty towns are renovated and transformed into the focus of urban construction. To investigate and study the urban heritage of third-line construction, explore the life scenarios of third-line construction builders and the protection and utilization value of existing urban heritage. Combined with the renovation design of Dahe Hotel in Panzhihua City, this paper expounds the background of the renovation, carries out value exploration from eight directions, proposes renovation strategies, promotes the inheritance and regeneration of "third-line" culture, optimizes the quality of the living environment, and promotes urban progress and sustainable development.

## **1. Overview of Cities of Three-line Construction**

### **1.1. Overview of Three-line Construction**

Starting from 1964, the first generation of Chinese leaders, in combination with the international environment and the actual national conditions at that time, decided to relocate the industries and military enterprises in the more economically developed cities along the coast and in the central part of the country to the western region in order to meet the requirements of preparing for war and famine. The guiding ideology is to buy time, actively build the three-line strategic rear base, to prevent the imperialists to launch a war of aggression [1]; the overall objective is to establish a strategic rear base in deep areas that combines industry and agriculture and serves national defense and agricultural in a relatively complete manner, by striving for faster and better economy. There are 'big three-line' and 'small three-line'. The 'three-line construction' mentioned today generally refers to the big three-line area that includes the northwest and southwest regions in a broad sense [2]. The focus of the three-line construction is in the southwest areas such as Sichuan, Guizhou, Yunnan, etc., and the project investment accounts for one-third of the three-line construction in

China, of which Sichuan accounts for a quarter of the whole country, and Panzhihua is the "top priority" of the three-line construction [3].

## **1.2. Overview of the Three-line Construction City, Panzhihua**

Panzhihua City was established on the basis of Panzhihua Iron and Steel Industrial Base, as the key project of China's three-line construction. Panzhihua Iron and Steel Industrial Base is a key construction project that Chinese leaders are very concerned about it many times, and it is a significant project to which all parties have devoted the most efforts in the first phase of the three-line construction. Panzhihua Iron & Steel Company produced iron since June 1970, and the first phase of the project was completed in 1975, and the second phase of the expansion project was completed in 1996. During the three-line construction, it has broken through one difficulty after another, and achieved one achievement after another that has attracted the attention of the world.

When the builders of the three-line construction went to Panzhihua from the big city with relatively superior conditions, launching the slogan of "producing before living", with the lofty ideological consciousness of "living in a dry base, caring for all mankind", in the complex geographical environment of the three-line area, braving hardships and difficulties, building an enterprise through hard work/arduous efforts, this struggle is a glorious era capable of evoking praises and tears in the history of the Chinese nation, and its construction achievements can hardly be measured in terms of money. [4]

## **2. The Current Situation of Protection and Development in Urban Heritages of Three-line Construction**

### **2.1. The Current Situation of the Urban Heritages of Three-line Construction**

At present, the definition of the concept of urban heritage in the domestic academic community is roughly divided into two different perspectives: broad and narrow. This paper focuses on and explores urban heritages in a narrow sense.

The three-line construction developed northwest and southwest China into cities with a large number of modern manufacturing and scientific research institutions at the time. However, due to the needs of the time, the construction of factories and infrastructures during the three-line followed the guiding principle of "scattered, hidden, and by the mountains", and many of the three-line enterprises were located in places with inconvenient transportation and far away from raw materials, so supporting infrastructure construction in the living quarters was carried out near the enterprises. Nowadays, the protection and utilization of many such places are getting the attention and importance from the society and government. For example, the old buildings left by Deyang Dongfang Electric Machinery Factory will continue to be used after reinforcement without affecting their functional use and safety; the old red brick masonry buildings with sloping roofs of the former 902 Factory in Mianyang are currently used as places for national defense science and technology education; some of the remaining buildings of the Guangyuan Donghe Printing Company, the living quarters of the Southwest Metal Products Factory in Mianyang, have been transformed into silk companies; and Chengdu Eastern Suburb Memory is mainly a factory building, incorporating cultural elements, and carrying out cultural landscape renovation; Chengdu state-run TV equipment factory, including the former hospital, dormitory, school and other functional buildings, is currently idle, etc. [5].

## **2.2. The Current Situation of Protection and Development of Urban Heritages in Panzhihua**

Panzhihua is a city gradually developed due to the three-line construction, with a significant amount of urban heritages, including 503 underground war power factory, as a testimony to the industrial development of Panzhihua, which is currently preserved and expected to become a branch of museum in the three-line construction; three piles of iron bridges and the Yajiang River Bridge are still used for transportation; Lanjian iron ore mine to create a landscape of industrial terraces, etc. Urban heritages record the history by themselves, inherit the culture, and carry the symbols of the city's historical memory and the spiritual culture of people in Panzhihua, heritage protection is to protect the carrier of history and culture. In order to inherit the spirit of the three-line construction and retain the architectural and cultural heritage of the three-line construction, it is an urgent task for Panzhihua to protect and utilize the urban heritages. [6]

## **2.3. The Dilemma on Protection and Utilization of the Value of Urban Heritages of Panzhihua**

For Panzhihua, the red brick buildings in the living area in the urban heritages are not only the material carriers of the spirit of the three-line construction, but also the witnesses of the historical changes in Panzhihua, which also has a very high artistic value. Nowadays, the current situations of the red brick buildings once collectively built and lived by the three-line construction builders are not optimistic, and most of them are in a state of being idle and unattended, with unstable building structure, walls being painted randomly, and even facing the danger of being demolished soon. Since they are old and have not been repaired, the environment in the old factories and old mining areas is harsh, the early construction lacks reasonable planning, and the basic supporting facilities are not perfect, which cannot keep up with the current living needs of the residents. Now it is not suitable for people to continue to use and live in. [7]

With the rapid development of China's urban economy and international status, the strategic significance of Panzhihua's three-line construction has gradually weakened, accompanied by the question of what course to follow for Panzhihua now? How to play its role again in the future of the three-line construction deserves our deep thought.

## **3. Protection and Development of Urban Heritages Value of Three-line Construction in the Context of Urban Renewal**

### **3.1. Background of Urban Renewal**

Urban renewal is not a simple renovation of the old cities and districts, but the renovation from large-scale incremental construction to both stock quality improvement and incremental structural adjustment. The goal of the implementation of urban renewal initiative for China is to build a livable, green, resilient, intelligent and humanistic city.

The renewal of shanty towns is also an indispensable part of urban renewal. State Council Premier Li Keqiang said in his government work report that the main objectives of the 14th Five-Year Plan period are to "develop and expand city clusters and metropolitan areas, implement urban renewal initiative, improve the housing market system and housing security system, and improve the quality of urbanization development." This is the first time that "urban renewal" has been written into the government work report. The Panzhihua Municipal Government attaches great importance to the renovation and construction of shanty towns. In March 2017, the municipal government issued the task of implementing the renovation of shanty towns in the western district, including the Yanjiang area and the Gaojiaping area; in 2018, Panzhihua City implemented nine pilot projects for the renovation of old residential communities, including the No.2 Street

Residential Community. In the Pilot Scheme of Renovation of Old Residential Communities in Panzhihua City clearly defined the principles, scope and content of renovation. It is designed and implemented synchronously with the renovation of residential buildings, public service facilities and environment, so as to ensure the coordinated advancement of the renovation work. It is not difficult to see that the government policies are conducive to urban renewal and to promote the continuous development of the cities.

### 3.2. Value of Protection and Development

Panzhihua, as a leading and successful model of the three-line construction, has created many memories and characteristic buildings at that time during the development of the city. The protection of urban heritages is to protect the carrier of history and culture, and Panzhihua's characteristic red brick buildings are the important urban heritages of the three-line construction. Protecting and making good use of red brick building plays an important role in the adjustment of urban functions and urban renovation, further improving urban functions and urban quality.

The urban heritages of the three-line construction were analyzed for value in eight main aspects (Table 1): from history (chronology, context, historical figures and events), culture (representation, symbolism and experience), society (social contribution, social participation and urban development), art (formal style, design level and artistic aesthetics), science (building materials, structure and process), economy (economic value-added, value expectations of building renovation and of environment and facilities renovation), environmental (micro environment, regional environment and local cultural environment) and use value (current use, facility services and adaptability).

Table 1: Analysis of the Value of urban heritages in the Three-line construction (Source: drawn by the author)

Survey Items		Description
Historical Value	1. Historical Era	Construction Time
	2. Historical Background	Whether it represents a certain stage in the cultural, social, political and economic industrial development of the three-line construction
	3. Historical Figures, Events	Whether there is an important connection with famous figures, organizations and events in the three-line construction
Cultural Values	1. Cultural Representation	Whether it represents the local regional culture, folklore, landscape features
	2. Cultural Symbolism	Whether it carries a certain spirit, belief, social culture and construction concept in the three-line construction
	3. Cultural Experience	Whether it carries historical memory and emotional resonance, giving people a unique experience of historical atmosphere
Social Value	1. Social Contribution	Whether it promotes social development and progress, and contribute to the rational use of social resources
	2. Social Participation	Whether the building is strongly related to residents' life and the public's awareness of protection?

	3. Urban Development	What is the impact on urban public space, whether it can contribute to the renewal of urban development
Artistic value	1. Formal Style	Whether the shape, form, style, and genre of building are distinctive enough
	2. Design Level	Design ideas layout, space relationship, process and detail features
	3. Scale	Existing scale and completeness
	4. Artistic Aesthetics	Whether the building exterior, decoration and construction techniques are aesthetically pleasing enough
Scientific Value	1. Building Materials	Whether it is advanced, reasonable, regional
	2. Building Structure	Whether it is advanced, reasonable, resilient
	3. Building Process	Whether it is advanced, reasonable, unique, representative
Economic Value	1. Economic Value-added	Whether there is economic value-added space for comprehensive development
	2. Economic Value Expectations of Building renovation	How long will it take to reflect the economic value of the renovated building in the near future or in the long term?
	3. Economic Value Expectations of Environment and Facilities Renovation	How long will it take to reflect the economic value of the renovated environmental supporting facilities in the near future or in the long term?
Environmental Value	1. Micro-environment	Whether it is iconic for the landscape quality of the building site environment,
	2. Regional Environment	The degree of availability of landscape resources around the building
	3. Coordination with Surrounding Environment	Whether the building site environment and urban functions, industrial structure and facilities are compatible, and whether the surrounding traffic conditions are harmonious
	4. Relationship with Local Cultural Environment	Whether it reflects the special spatial texture of a region, or whether it can represent a specific planar structure form
Use Value	1. Current Use	Whether the building functions and current use are good, and whether there are enough needs and possibilities for improvement
	2. Facility Services	Whether there is enough infrastructure as the support under the current use
	3. Adaptability	Adaptability of the building to accept or replace new functions, and flexibility of building space layout and renovation

### 3.3. Principles of Protection and Development

#### 3.3.1. Human-oriented

Adhering to the principle of people-oriented, analyze the overall needs of the community residents, expand from the protection of key buildings to improve the overall living environment of the community, fully reflect the care of the residents, and create a relaxed, comfortable and unique living and leisure environment with three-line local characteristics.

### **3.3.2. Overall Coordination**

Building does not exist in isolation, but is bound to harmonize with its surroundings, from the street to the city, according to social, cultural, geographical conditions, climatic factors, economic and other conditions. Of course, building should also have its own uniqueness, so its own individuality and diversity are considered while controlling the overall coordination of cities and streets. [1]

### **3.3.3. Sustainable Development**

With the continuous development of the times, people tend to pay more attention to sustainable development. Sustainable development has also become an inevitable choice for architectural design. The community renovation design based on sustainable development not only needs to provide a safe and comfortable indoor environment, but also needs an external environment that is in harmony with the natural environment.

### **3.3.4. Inheritance of Community Spirit**

The inheritance of community spirit is a challenging proposition for designers for their creation. This means not only exploring the deeper meaning of the community spirit, but also injecting new vitality into the community spirit. Formal imitation is unable to endow new buildings with the spiritual characteristics they should have, so there is no inheritance of community spirit.

## **4. Protection and Development of Renhe Street Community in Panzhihua in the Context of Urban Renewal**

### **4.1. Overview of Community**

Panzhuhua Renhe Street Community belongs to the old city of Renhe Town, Renhe District, Panzhuhua City, with an area of about 3 square kilometers, and the area under its jurisdiction is from the entrance of Renhe Street (Daheliang Station) in the north to the old bridge of Renhe (Street into Post Office) in the south, below the Earthquake Platform in the east and Tongan Lane in the west. There are 10 resident groups with a total of 2,675 households, 7,325 people and a transient population of 1,252. Among them, the Dahe Hostel and the old ICBC were left over from the three-line construction period of Panzhuhua, and are still in use today. (Figure 1 and Figure 2).





Figure 1: Bitmap of Renovation Plot of Renhe Street Community Center in Panzhihua City(Source: drawn by the author)



Figure 2: Bitmap of Renhe Street Community(Source: drawn by the author)

As an urban renewal design project in the context of the three-line construction in Panzhihua City, the project is near Renhe Valley, and there is a building heritage represented by the Dahe Hotel, which is the location of Renhe Street Community Service Center in Renhe District, the most prosperous neighborhood of the former Renhe District, and one of the key renovation areas of Renhe District Government in Panzhihua City. Urban renewal is to give new vitality and vigor to the region. In the old city of Renhe District of Panzhihua City, there is a rich variety of architectural forms and spaces, represented by Renhe Street Community during the three-line construction period.

## 4.2. Current Situation of Community

### 4.2.1. Traffic Environment of Community: Chaotic Pedestrian Flow and Insufficient Parking Space

The roads of Renhe Street Community basically meet the needs of vehicular traffic, but also ensure the reasonable layout of various infrastructures (such as municipal pipelines, lighting posts) and greening. but due to the confusion of pedestrian passages in out the community, there is insufficient parking space for vehicles in the community, and the temporary parking spaces are set up to occupy the driveway, causing a certain degree of inconvenience to the access of vehicles.

### 4.2.2. Landscape Environment of Community

#### Lack of green space and vegetation

Renhe Street Community takes full advantage of the topographic advantages of sloping land to form a terrace enclosed space. It consists of three scattered courtyards with three types of green plants: small shrubs, bonsai, and trees, as ordinary residential buildings account for more than 80% of the living area in the area. Due to the population growth and housing shortage, many residents have built their own houses, thus destroying the original courtyard space in the community for hardening, and the greening space is reduced, with only a few old trees and some flower ponds for greening.

#### Public space of community: lack of public facilities, single public space

Due to the lack of necessary planning or awareness of community functions in the early construction of the old city, special public recreation places and related facilities are generally not equipped. In the field research, Renhe street community is not equipped with basic recreation and sports equipment and recreation space.

Although there are many types of buildings in the old city, the facade shape and plane composition of each building are similar, mainly multi-story residential buildings with small stores on the ground floor. In general, there are only sparsely landscaped, flat but empty miniature squares in each community as a place for residents' activities, and the treatment of courtyards is still relatively elementary.

Architectural space of community: monotonous architectural style, compact spatial layout

Renhe Street Community is arranged in a surrounding manner, along the perimeter of the road, and the center is divided by height difference or fence to form three irregular courtyards. The residential form is divided into "ground floor business+residential houses" and "business office+residential houses", with mixed functions and no clear division. All multi-story buildings are divided by courtyards, and the buildings of retail, catering, office, residence and culture are randomly distributed and combined.(Figure 3)



Figure 3: Present Situation of Renovation Plot of Site Building of Renhe Street Community Center in Panzhihua City.

(Source: drawn by the author)

The single buildings of community lack characteristics, and the overall architectural style is diverse. During three-line construction period, the focus was on industrial development, and there was no detailed planning for urban development, which led to the disunity of the facade style of residential buildings and the rigidity and monotony of building facades. The sectional design is adopted to enrich the facade effect, so that the facade structure and outline show geometric changes, and the architectural lines are graceful and generous, emphasizing contrast and harmony from three levels: outline, lines and details. The building block is complete, and changed through local treatment, the height is patchy with distinct levels.(Figure 4)



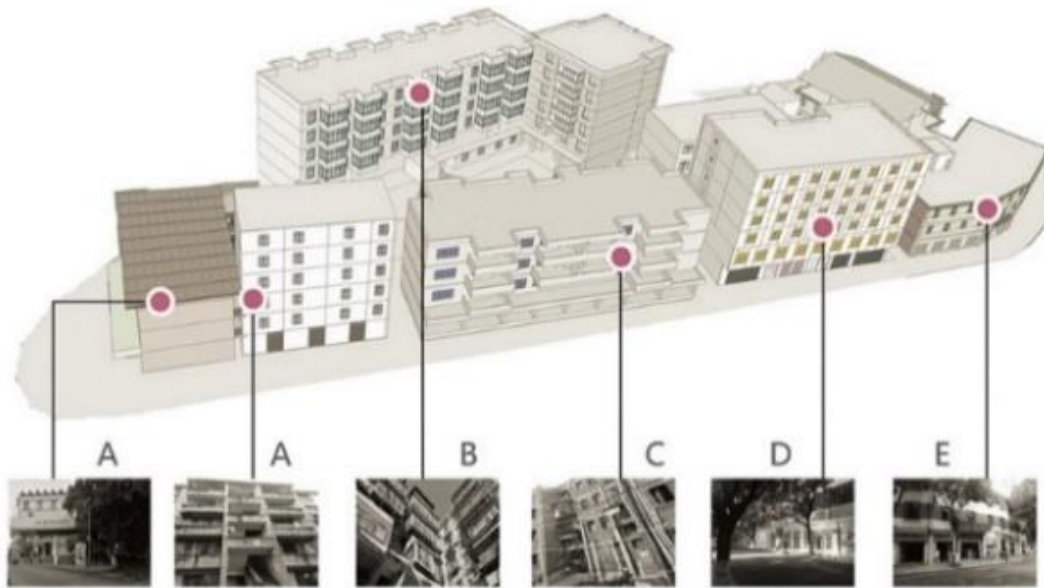


Figure 4: Schematic Diagram of Current Situation of Building Facade

(Source: drawn by the author)

The building materials are made of paints and tiles with a strong sense of quality and timeliness, and the facade color is a light and restrained cool color. In terms of technology and energy saving, it is understood that the exterior walls of the buildings in the Renhe Street Community do not use external insulation treatment, so they do not meet the requirements of building insulation and thermal insulation; the windows are made of ordinary glass, which does not meet the requirements of thermal insulation and sound insulation; however, solar water heaters are used to make full use of the abundant sunlight resources in the Panzhihua. In terms of building structure, as most of the buildings were built in the 1960s and 1970s, the brick-concrete structure (red brick precast slab) was used to increase the dead weight of the building.

The design of the house type is only the repeated splicing of a single house type, lacking flexibility and variety, and some of the house types share a bathroom and entrance door between two households. In terms of structure and spatial layout, the traffic space of the building is relatively narrow due to structural reasons, for example, the size of the public staircase of No.118 residence is only 1.2m. The building is compact and has lighting problems. The entrance space of the residence and the entrance space of the suite are designed to be narrow and dark, and as a buffer space in the building body, it can not only guarantee the convenience and privacy of people's life, but also can not promote household communication. On the other hand, due to the small apportioned area, the standard of the suite is lowered accordingly; the floor height of the building is 3.0m, which is far from meeting the national requirement that the floor height of residential buildings should not be less than 2.7m, so it is necessary to improve the living comfort of the residents.

### 4.3. Value of Community

#### 4.3.1. Historical and Cultural Values

Renhe street community has preserved the Dahe Hostel, an important historical building during the three-line construction period. For Panzhihua, the red-brick buildings represented by the Dahe Hostel are not only the material carriers of its three-line construction spirit, but also the witnesses of Panzhihua's historical changes, and it itself has a very high cultural value.

The remains of buildings record the memory of Panzhihua. These old buildings, which have gone through many vicissitudes of the past and stood silently, can always arouse people's memories and longings, and by communicating with their space, people seem to return to the era of passionate construction. It can be said that these legacies have indelible historical significance in the process of urban development. When the builders of the three-line construction went to Panzhihua area from the big city with relatively superior conditions, launching the slogan of "producing before living" [8], with the lofty ideological consciousness of "living in a dry base, caring for all mankind", in the complex geographical environment of the three-line area, braving hardships and difficulties, building an enterprise through hard work/arduous efforts, this struggle is a glorious era capable of evoking praises and tears in the history of the Chinese nation, and its construction achievements can hardly be measured in terms of money. The red brick house carries historical memories and emotional resonance, giving people a unique experience of historical atmosphere.

#### **4.3.2. Artistic Value**

Human beings have always had a natural sense of attachment, identity and belonging to their own history and culture. This is even more evident in the buildings. Although they may no longer have their original practical functions, they have been the product of the three-line construction era, witnessed the historical trajectory of urban civilization and technological development, and have a distinctive historical imprint.

By introducing new artistic ideas and creative techniques, the old buildings and communities are made to have both modern artistic flavor and profound historical and cultural deposit, providing people with a new perspective to examine and appreciate the integration of rich history and contemporary art, i.e., the rational exchange of old and new aesthetic values, the contradictory factors such as the strong contrast between fine modern technology and rough equipment of the old era, and the clever echo of modern aesthetics and traces of the past. In this clever integration of "new" and "old", it gives people a strong visual impact and a rich spiritual experience. It is through the preservation of the "old" and the introduction of the "new" that these past three-line construction heritages will have eternal vitality.

#### **4.3.3. Social Value**

When Panzhihua experienced the glory of the past, the red brick houses that were once collectively built and lived by the three-line construction builders gradually become declining and broken with the loss of population. There are even red brick houses, due to old and dilapidated, in old factories and old mines with poor environment, lack of reasonable planning in early construction, and imperfect infrastructure facilities, which cannot keep up with the current needs of the residents, and are no longer suitable for use and living. Therefore, in order to inherit the spirit of the three-line construction and preserve the architectural and cultural heritage of the three-line construction, it is our urgent task and responsibility to protect and renovate the buildings. Since the building has been used for a long time and has been repaired from time to time, it is relatively well preserved. At the same time, Renhe Street Community Center is located in the center of Renhe District, and the successful renovation of Dahe Hotel and Renhe Street Community will reshape the public's new public activity places and bring positive influence to citizens' lives.

### **4.4. Update Project**

#### **4.4.1. Scientific Value: the Recurrence of Technical and Emotional Values in the Project**

The recurrence of technical and emotional value should be based on the scientific value, with the

theme of protection, optimization of land use index and improvement of residential use, and comprehensive consideration should be made from the aspects of history, culture, technology, artistic aesthetics and economic application. In the renewal project, the materials, structures and techniques are improved, and the overall appearance of the street is restored with an emphasis on the impact on the overall appearance, in combination with the integration of the overall landscape and community functions.(Figure 5)



Figure 5: Schematic Diagram of Renewal Design of Renhe Street Community.

(Source: drawn by the author)

#### **4.4.2. Environmental Value: Reshaping the Aesthetic Value of Building and Environment**

In the renewal design of Renhe street community, since some of the design can no longer meet the growing number of residents, under the premise of ensuring the basic housing for residents, the illegal buildings in the central courtyard were demolished in a centralized way, and the original building density and centralized greening sites in the community were restored. According to the characteristics of Panzhihua mountainous area and the actual condition of the site, the design prototype of "road" is extracted through symbolic techniques, and the basic landscape elements such as "flowing water" and "winding road" were extended by using structural design techniques of harmony, rhythm and contrast. Through the visualization of cultural symbols, the overall design is completed by using curves as the overall plan composition and adopting fractal, intersection, reorganization and echo from the perspective of satisfying traffic needs. Combining the principles of modern garden design and western formal beauty, the real historical process is reproduced through the concrete representation of landscape entities, and the historical "group memory" is reproduced. At the same time, it echoes the surrounding buildings, enclosing and echoing, to form a new landscape space and creating a community landscape experience with Panzhihua characteristics.(Figure 6)





Figure 6: Schematic Diagram of Landscape Renewal Design of Public Space in Renhe Street Community.

(Source: drawn by the author)

#### 4.4.3. Economic and Use Values: the Recurrence of Urban Block and Community Value

The recurrence of urban block and community value is mainly manifested in the re-growth of people flow consumption. Therefore, in the design of the ground floor community commercial layout, the residents within the community are the basic service targets, and then the community visitors and nearby residents. With the aim of facilitating the people, benefiting the people, satisfying and promoting the comprehensive consumption of residents, small restaurants, cafes, supermarkets, bookstores and other commercial models were developed, and a unified style was designed according to the thematic appearance of the community to present a complete cultural experience.(Figure 7)



Figure 7: Renovation Design Effect Drawing of Renhe Street Community.

(Source: drawn by the author)

The renewal and renovation of the Renhe street community is mainly to explore the historical and cultural values of the community, which are the concrete carriers of the urban culture, and the results of its preservation and exploration are consistent with the orientation of urban development, so it is supported by the government's project funds. Due to the loss of the current workforce, it is impossible to attract sufficient young people to settle in, so the building function is renewed by replacing the "youth business incubation base" with "full service long-term rental apartments" to improve the income balance of the community property.

## 5. Conclusion

The urban renewal project of Renhe street community has been analyzed from 8 aspects of value utilization and renewal suggestions. Through value assessment analysis, according to its geographical environment and future development direction, it provides a sample of the protection and utilization of the urban heritages of the three-line construction, which not only to improve the living environment of residents, but also to promote the investment of related engineering projects and economic development by excavating the value of the three-line construction; promote economic development by upgrading Panzhihua's cultural industry.

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