A Train Trip through the Past, the Present and the Future

Revealing and Revitalizing the Chinese Eastern Railway

FLOWSCAPE STUDIO
Graduation Studio 2023-2024
Landscape Architecture Principles

P5 Report

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Master track of Landscape Architecture
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Fansination

My undergraduate university is located in Harbin, a pivotal city along the Chinese Eastern Railway. Before I learned about the city's historical connection to the railway's construction, I noticed rows of beautiful yet dilapidated Russian-style yellow houses surrounding the campus. These houses, typically enclosed within courtyards, were relics of the residential architecture from the era of the Chinese Eastern Railway. As I delved deeper into the city's history, I discovered more railway-related heritage sites dispersed throughout the urban landscape. I realized that the spatial structure and fabric of many urban areas were closely intertwined with the Chinese Eastern Railway. However, I also observed a stark disconnection between railway heritage and urban structure, with railway heritage sites often marginalized and isolated from the city. Some sites have become abandoned spaces, such as an overgrown railway line sandwiched between two residential areas.

With rapid urbanization, heritage areas are inevitably eroded by new urban areas. (Meng, Q., 2019) While the European style brought by the cultural diffusion through the railway remains a distinctive feature of Harbin's urban landscape, the historical context that initially carried this cultural input has gradually faded from the modern urban memory. I want to open up the railway system for more people, reverse the current situation, and let more people learn about this history and appreciate the heritage.


Abandoned heritage site/Photo taken by author


Abandoned Railway/Photo taken by author

Introduction

The Chinese Eastern Railway Heritage stands as the largest modern heritage group in Northeast China. Since the inception of modern heritage protection in China, this railway heritage has garnered significant attention due to its extensive span, large quantity, scale, and series of heritage buildings. Researchers and heritage enthusiasts have conducted extensive studies on various aspects of heritage protection, from basic heritage surveys and certifications to value assessments, protection and development, structural technologies of heritage buildings, and the morphology of towns along the railway. These studies provide a solid theoretical foundation for this thesis. By reviewing historical records and prior detailed research, I have quickly gained a comprehensive understanding of railway heritage, constructing a framework that considers the railway heritage system from railway(regional) scale, town scale, and individual sites scale, while also learning many heritage protection theories.

Subsequently, starting from the current poor condition of the heritage, I analyzed and identified spatial issues from larger scales and contexts. However, from an understanding of conservation policies and practical cases, it became apparent that there is a predominant focus on the reuse of individual heritage buildings, with insufficient attention to larger-scale issues—historic environment and urban landscape. Moreover, I found that existing research on CER already studied these problems at different scales, with some studies providing planning-oriented guidelines but lacking effective design interventions applicable to practical situations, such as how and why historic buildings and their landscape should be restored, utilized, or reinterpreted.

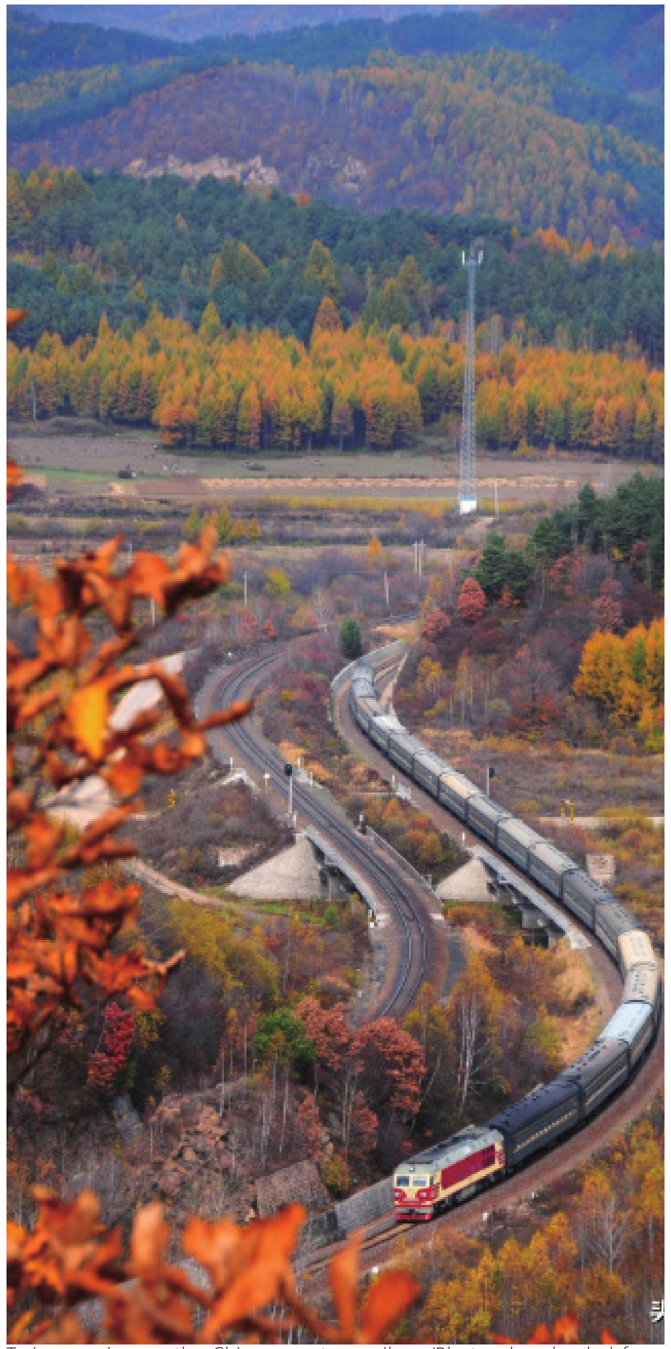
Therefore, this thesis aims to bridge this gap and comprehensively improve heritage conditions from different scales. By integrating theories from different scales, deepening the understanding of heritage environments and the readable context of heritage, I propose design strategies and specific landscape intervention measures within a comprehensive spatial framework. These aim to revitalize heritage by opening them to tourists and enhancing the surrounding environment and landscapes. I have chosen an almost abandoned Eastern railway line to test these design principles and strategies. This testing also provides feedback for previous theoretical research and insights and guidance for future heritage conservation practices.

Natural landscape around some heritage railway towns

Natural landscape around Yimianpo/taken by author

Natural landscape around Daguanling station/taken by author

CONTENTS


Trains running on the Chinese eastern railway/Photo: downloaded from https://www.toutiao.com/article/6852212330126967309/?&source=m_redirect

Part I RESEARCH FOR DESIGN

Part II RESEARCH THROUGH DESIGN

Part III CONCLUSION&REFLECTION

CER Railway map/Kitaiskaia-Vostochnaia zh. d.,1903, downloaded from https://hdl.loc.gov/loc.gmd/g7822m.ct011344

1. INTRODUCTION

Location

FIG. 1.1 Siberian railway(base map: https://zh.m.wikipedia.org/wiki/File:Transsib_international.svg)

Siberian railway

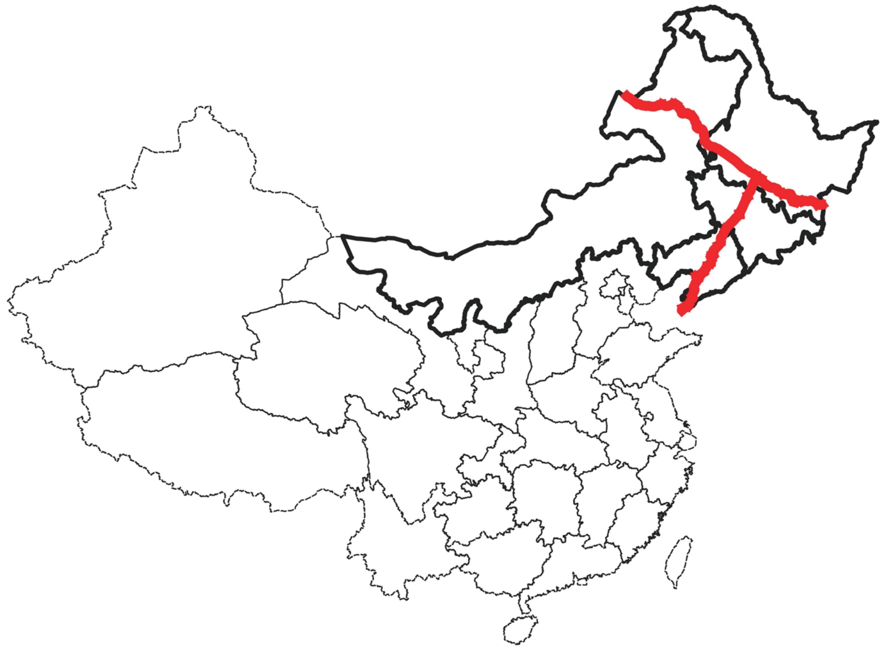


FIG. 1.2 The location of CER in China (data from Baidu map)

China

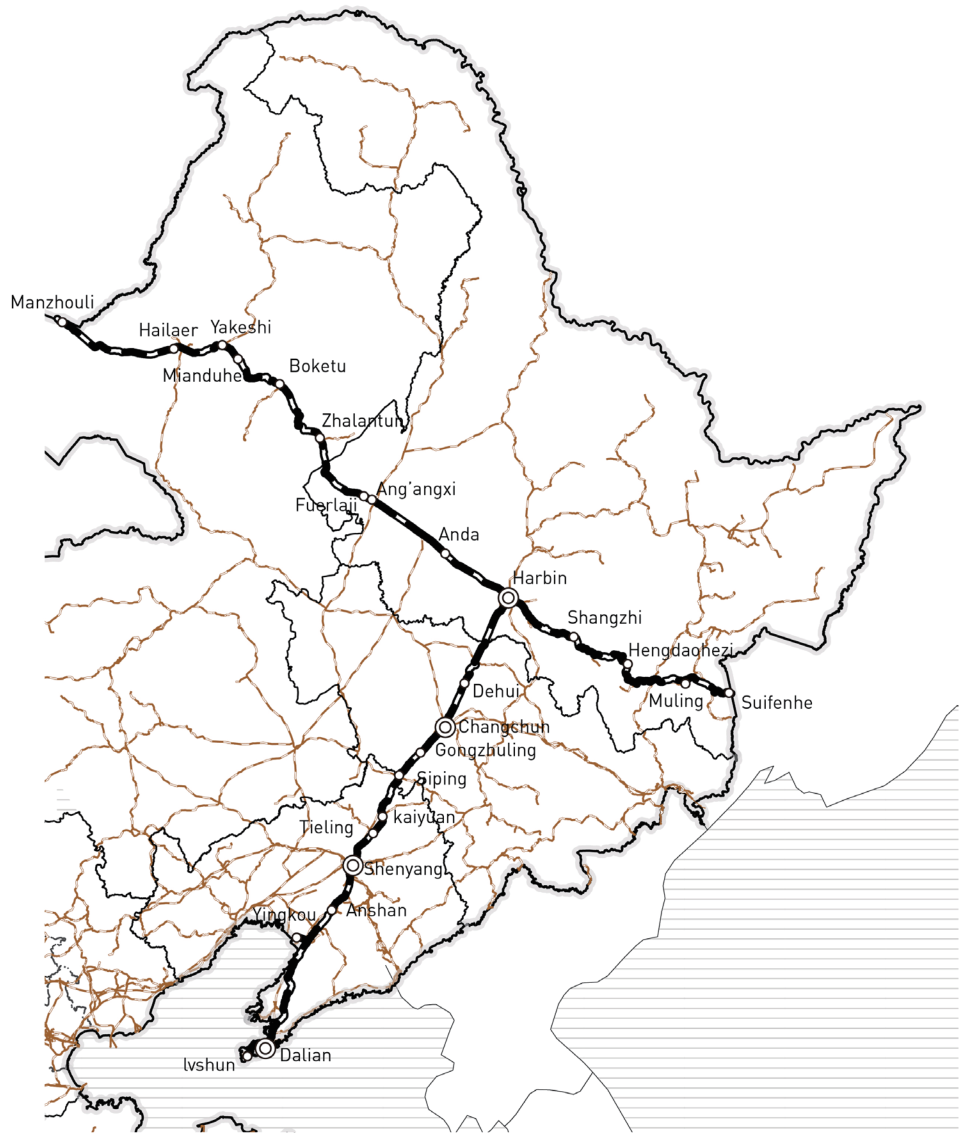


FIG. 1.3 CER route map (data from Baidu map)

Chinese Eastern Railway

1.1 Chinese Eastern Railway

The Chinese Eastern Railway was established by Tsarist Russia on Chinese territory, which was strategically aimed at asserting control over the Far East by exploiting China's resources.(Fei, G., 2018) As an integral part of the world-famous Trans-Siberian Railway, this international railway spans a total distance of 2,489 kilometers, construction commenced in August 1897 and opened to traffic in February 1903.(Fei, G., 2018) Configured in a "T" shape, the railway traverses the entirety of Northeast China. Since its operation in 1903, it has served as the principal corridor for both freight and passenger transportation in the region. Despite the rapid advancement of high-speed railways, numerous sections of the railway remain operational to this day.

1.2 CER timeline

A review of the history of the China Eastern Railway from 1896 to 1952 reveals that this railway witnessed nearly half of China's modern and contemporary history. Since its construction, the railway has been at the center of ongoing conflicts and changes of ownership. It endured the artillery fire of the Russo-Japanese War and the experiences of Russian and Japanese colonial rule, whose influence on urban planning and the architectural style of the area along the railway line can still be seen from the left heritage. Thus railway and related heritage stand as a significant witness and recorders of the modern urban history of Northeast China during this period which has important historical and cultural significance.

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CER company estabilished
1896

1897
Railway construction started with Harbin as the center

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1898
Russia and China signed the *Luda Land Lease Treaty*, obtain rights to build the Harbin-Lushun (South Manchuria Railway); Boxer Rebellion destory railway

1903
Railway completed and opened to traffic

1904
The Russo-Japanese War breaks out

1905
Russia transferred the Changchun-Lushun section all its rights to Japan

Screenshot from the video: https://www.dailymail.co.uk/embed/video/1566820.html

1917
the Great October Socialist Revolution; Chinese government has gradually taken back jurisdiction over railway dependent territories

1924
China and the Soviet Union were jointly managed, with the Soviet side serving as the railway director

1929
Northeastern warlords seized railway by force but then recaptured by the Soviet Union

1931
The September 18th Incident
Japanese armed invasion of Northeast China

downloaded from: http://www.japanfocus.org/-Tomoko-AKAMI/3926

1933
Jointly operated by the Soviet Union and Manchukuo(Puppet state controlled by Japan)

1935
The Soviet Union sold the railway and associated land to Manchukuo

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1945
Japan surrenders;
The National Government and the Soviet signed a treaty to jointly operate it for a period of 30 years. Everything will be taken over by the Chinese government after the period

1945
The Soviet army occupied Changchun and took over the railway

1952
The Soviet government transfers all rights to the railway and all property belonging to the railway to chinese government without compensation and shall fully own it.

1890 **1900** **1910** **1920** **1930** **1940** **1950** **1960**

ownership	**Tsarist Russia**	**Japan-Russia**	**China and the Soviet Union**	**Japan**	**China and the Soviet Union**	**China**

FIG. 1.5 CER timeline and histocal events

1.3 CER Heritage

During the initial stages of railway construction, as the route traversed vast uninhabited areas, not only engineer facilities but also a large number of public and civil constructions along the railway were constructed. (Fei, G., 2018)These buildings and facilities, diverse in type and numbering over a thousand, include railway structures such as stations, pedestrian overpasses, roundhouses, water towers, maintenance depots, and bridges, as well as public buildings like factories, residences, and churches. (Meng, Q., 2019) Today they still stand along the Chinese Eastern Railway line, distributed in the four provinces and municipalities in the Northeast region of China.

Some of the railway equipment and engineering facilities have always been in use since their construction, and have become living legacies showcasing the railway industry's technology from a century ago. The majority of the railway's auxiliary and town buildings were designed by Russian architects, exhibiting diverse forms and exquisite craftsmanship. And due to the use of Chinese labor and local materials, they present a blend of Chinese and Russian architectural styles. These remains constitute an important part of the modern architectural heritage in Northeast China, recognized gradually since 2006 as significant cultural heritage of the 20th century, owing to their scientific, artistic, and historical value.

over 2000 heritage buildings and facilities distributed along 2500km CER

FIG. 1.6 CER Heritage collage

1.3.1 Engineering facilities and Architectural Heritage

Railway engineering facilities mainly included railway tracks, bridges, tunnels, and culverts. (Li, Q., Liu, D. and Song, J., 2023)

The railway, spanning from west to east, traverses mountains and rivers, boasting a total of **668** bridges, 4 long tunnels, and numerous smaller tunnels and culverts. According to historic data, there are four types of bridges: 256 stone arch bridges, 391 steel I-beam bridges, 15 steel truss bridges, and 6 reinforced concrete bridges. The stone arch bridges are mainly distributed in the east, the metal ones are predominantly located in the west, and reinforced concrete bridges are used sparingly due to the cold weather. (Li, Q., Liu, D. and Song, J., 2023)

Among these, the eastern line, where stone arch bridges are most prevalent, traverses a mountainous region rich in high-quality stone. Consequently, the Russians adopted and adapted Chinese stone arch bridge construction techniques, utilizing local materials to build railway bridges. All the stone arch bridges along this route were constructed by Chinese workers, whose expertise in stone arch bridge construction was invaluable. This highlights the cultural exchange and integration fostered by the construction of the China Eastern Railway. While the railway heritage carries certain colonial undertones, the contribution of Chinese workers' ingenuity and labor is undeniably significant.

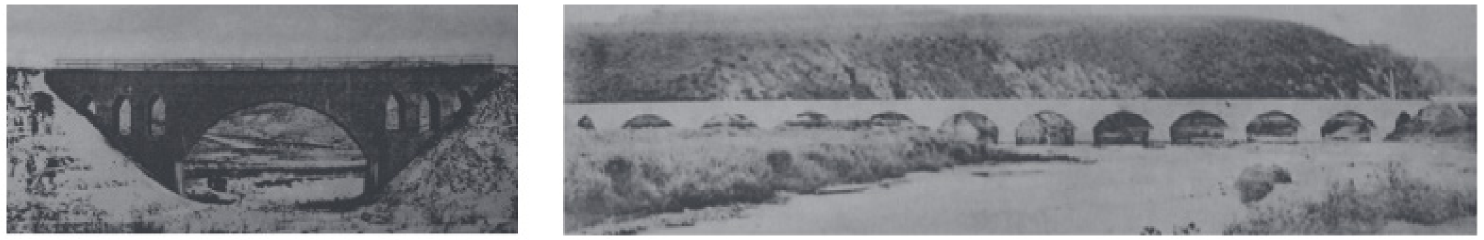
Four tunnels of the China Eastern Railway, all on the mainline, pass through the outer Hinggan Mountains and the extending branches of the Wanda Mountains (Li, Q., Liu, D. and Song, J., 2023). Apart from tunneling, another method for traversing the mountains involves employing spiral lines. Trains ascend slopes at gradients below 15%, facilitating passage over elevated terrain. To accommodate the terrain during the ascent, culverts, and short bridges are often installed along the route.

Many of these engineering structures, having endured for a century, have either been dismantled, or left unused, due to their non-compliance with modern standards, for example, all the railway spiral loops. Only a few engineering structures are reused, like transforming railway bridges into road bridges. According to some research data, only more than **30** bridges, tunnels, and culverts are preserved. (Li, Q., Liu, D. and Song, J., 2023)

Railway spiral loops

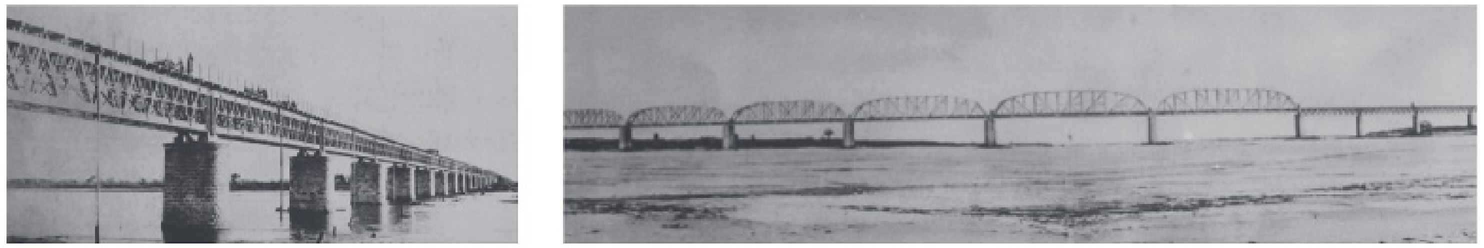
FIG. 1.7 Railway spiral loops/The Construction Album of Chinese Eastern Railway(1897-1903), 1905

stone arch bridges



steel I-beam bridges

steel truss bridges



tunnel

culvert

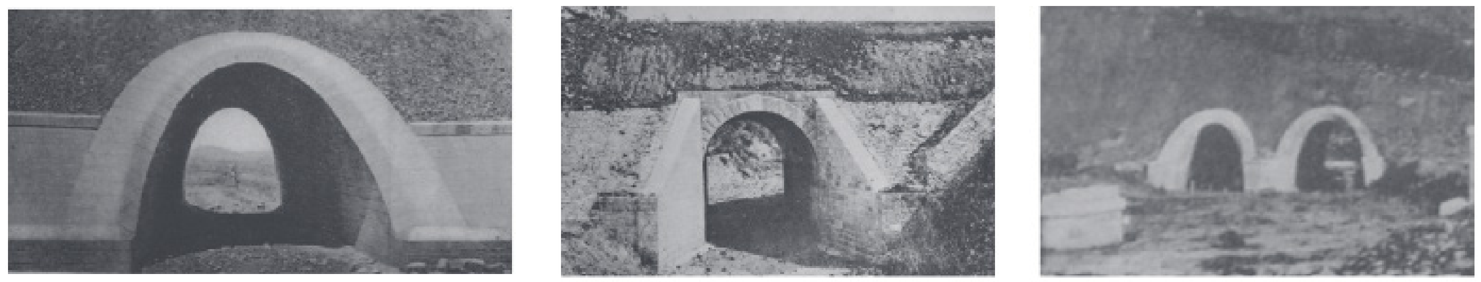


FIG. 1.8 Types of bridges, tunnels, and culverts/The Engineering of Chinese Eastern Railway (1897-1903), 1904

1.3.1 Engineering facilities and Architectural Heritage

The heritage of the China Eastern Railway extends beyond engineering structures to encompass various types of buildings serving different functions. Initially, basic infrastructure such as stations, warehouses, locomotive depots, and water towers were constructed to meet construction and operational needs. As the railway brought increased human traffic and trade opportunities, more comprehensive services became necessary along its route, leading to the construction of a series of town buildings.

Primarily, transportation and industrial facilities were established, Subsequently, residential and daily service buildings were provided for railway staff, such as ordinary cottages, apartment buildings, public baths, railway staff clubs for leisure and entertainment, as well as more advanced hospitals and sanatoriums. Due to the strategic locations of some stations, military facilities like barracks, fortresses, prisons, and police stations were also erected.

Among the current 2,000 remaining architectural heritage sites, excluding some buildings of indiscernible function, **the rest can be categorized into four types based on their functionality: 559 railway and industrial buildings, 117 military and police station buildings, 89 public buildings and comprehensive service facilities, and 1,147 railway community residential buildings.** (Li, Q., Liu, D. and Song, J., 2023)

From the images, a diverse range of architectural styles, materials, and colors can be observed, reflecting a blend of architectural artistry. There are Slavic Russian styles, contemporary European Art Nouveau styles, and Eclectic architectural styles. Brick is the predominant building material, often adorned with wood-carved eaves decorations. Adaptation to local conditions is evident, with stone used predominantly for buildings in mountainous areas and log construction prevalent in forested areas and grasslands. Colors generally correspond with the building materials, with warm tones such as red and yellow predominating.

Despite the varied architectural styles, identification of CER heritage buildings is facilitated by commonalities such as building colors, brickwork decorations, and cornerstones. The standardized construction of similar building types across the extensive China Eastern Railway network has resulted in a cohesive and serialized collection of architectural heritage.

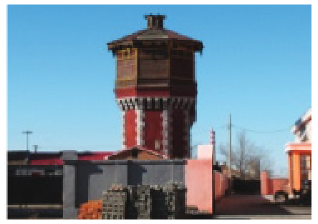
Railway traffic and industrial architecture

Station

Locomotive garage

Office

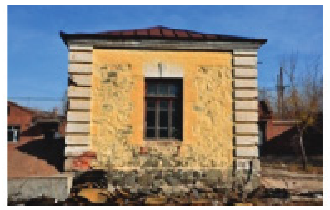
Water tower



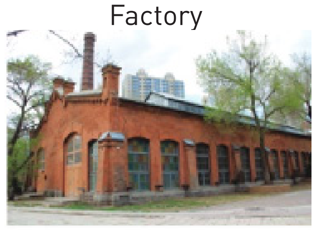
Freight warerhouse

Work area

Other facilities



Factory



Buildings for military and police stations

Command

Military camp

Stables

Magazine

Fortification

Small camp

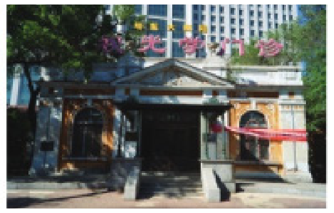
Police Station

Prison

Public buildings and integrated service facilities

Office

Hospital



School

Railway Club

Church

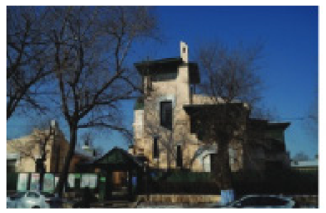
Public bath

Public toilet

Park

Residential buildings

Senior official residence



House

Joint residence

residential building

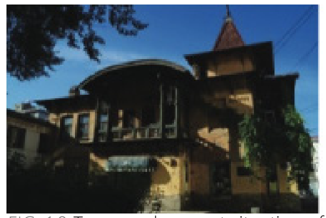


FIG. 1.8 Types and present situation of architectural heritage in the CER (Li, Q., Liu, D. and Song, J., 2023)

1.3.2 Heritage urban patches

Many stations and residential areas for railway operations and management at that time became the first town and village zones along the railway line. With the opening of the railway, the passenger and freight capacity in the Northeast region surged dramatically. Many stations along the route began to exploit resources and develop trade. Additionally, due to the global turmoil of the time, a significant influx of Russian and European immigrants occurred. Consequently, originally high-ranking and large-scale stations rapidly evolved into towns, and more buildings and facilities were built, which started the urbanization development of Northeastern towns. (Meng, Q., 2019)

Until today, these historic buildings were preserved in clusters, and the urban fabric and layout of most areas have been maintained to the present day, forming heritage patches within the towns. The construction and planning of the Chinese Eastern Railway had profound temporal and spatial impacts on the morphology of the towns along the railway line. The historic layout and fabric of the some towns are still evident on today's photo.

Hengdaohezi historic map

FIG. 1.9 Hengdaohezi historic map/The Engineering of Chinese Eastern Railway (1897-1903), 1904

1897-1903 Hengdaohezi Town

FIG. 1.10 Hengdaohezi historic map/The Construction Album of Chinese Eastern Railway(1897-1903), 1905

Hengdaozi current map

FIG. 1.9 Hengdaohezi google satellite map

2015 Hengdaohezi Town

FIG. 1.10 Hengdaohezi Town/downloaded from https://www.sohu.com/a/3659976_103313

1.3.3 CER Heritage Corridor

Heritage Corridor is a special manifestation of a Heritage Area. (Fei, G., 2018)This concept originated from the greenway theory in the United States.

There are some definitions of a greenway that refer to cultural heritage:
"A greenway is a linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridgeline, or overland along a railroad right-of-way converted to recreational use, a canal, scenic road, or other route ."(Little 1990, preface)

"An open-space connector linking parks, nature reserves, cultural features, or historic sites with each other and with populated areas."(Little 1990, preface)

In a sense, heritage corridors can be compared to greenways, with the same linearity, continuity and other characteristics, a linear landscape that is a collection of cultural resources. **And It can be seen from the definition that the heritage corridor does not adopt the concept of local point heritage in the past, but it is to comprehensively protect the heritage as a whole as a regional scope**(Fei, G., 2018), which makes it helpful for constructing and interpreting linear complex systems of cultural heritage like the Chinese Eastern Railway.

As it is difficult to describe railway heritage only as heritage buildings, heritage districts, heritage towns. Almost 2000 heritage buildings and facilities form nearly a hundred heritage patches with historical stations as the core, and 2000km of railways connect them in series to form a corridor.

The Grand Canal of China

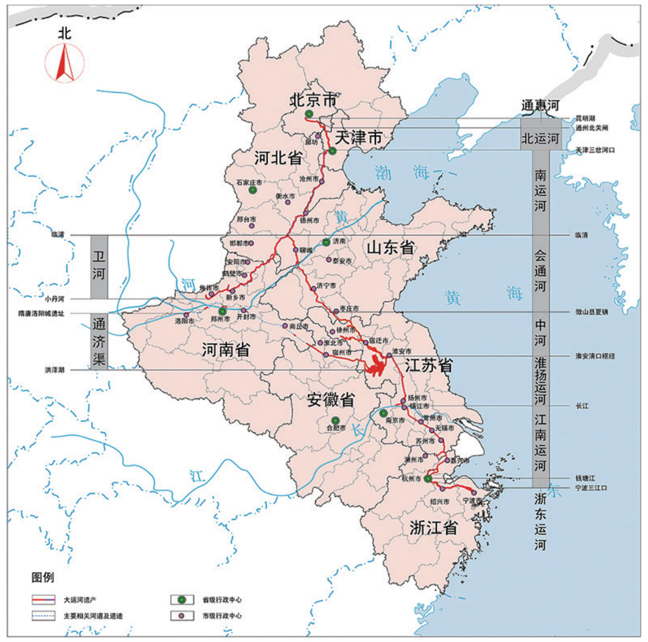


FIG. 1.11 Heritage corridor of The Grand Canal of China/Fei,G., 2018

Canal Industrial Heritage Corridor structure

FIG. 1.12 Heritage corridor structure of The Grand Canal of China/Fei,G., 2018

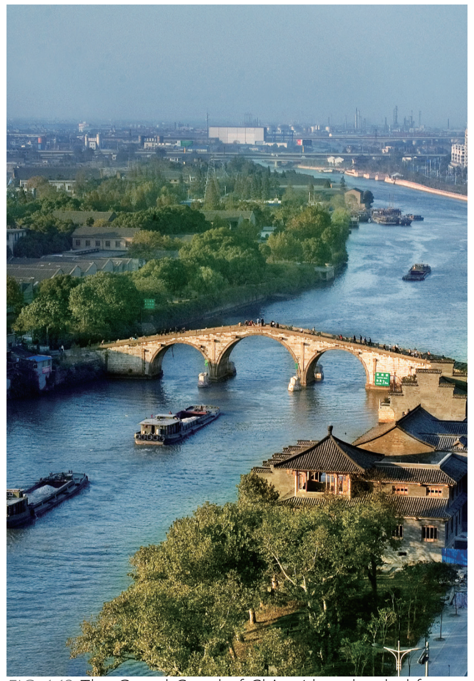


FIG. 1.13 The Grand Canal of China/downloaded from: http://Þnance.people.com.cn/n1/2022/0514/c1004-

Chinese Eastern Railway

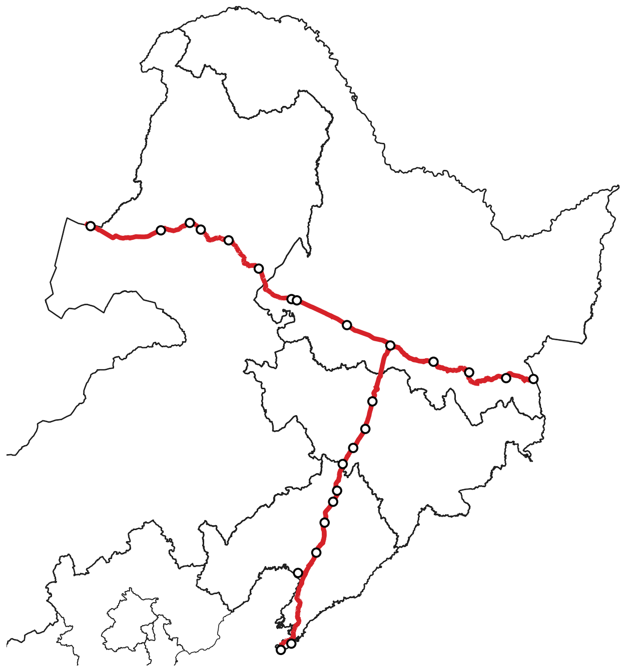
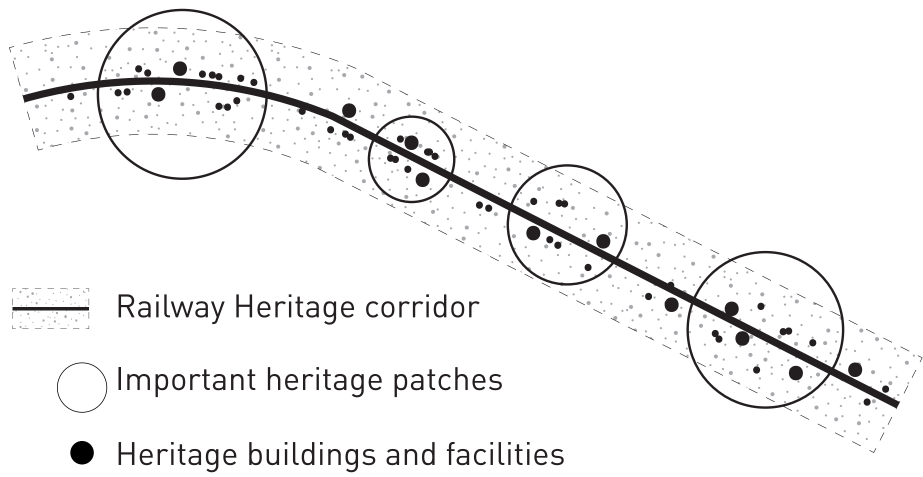


FIG. 1.14 CER Heritage corridor and structure/drawn by author



Chinese Eastern Heritage Corridor structure

FIG. 1.15 CER running in the autumn scenery/ downloaded from: https://www.toutiao.com/article/68

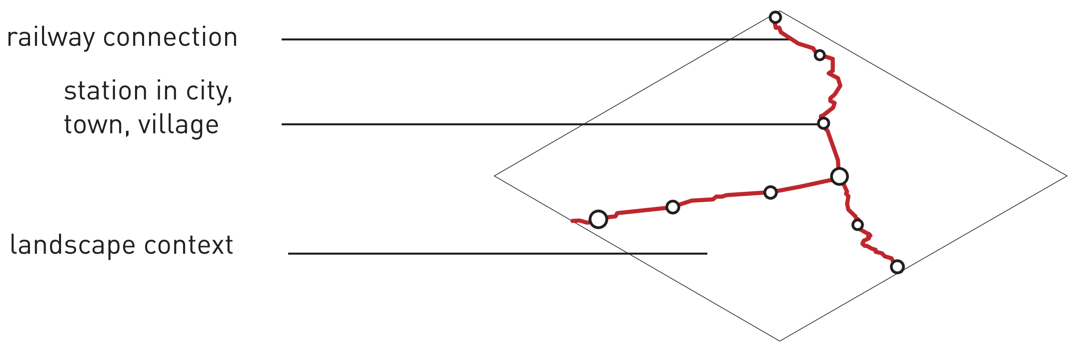
1.3.3 CER Heritage Corridor

Faced with such an important and complex system, it is better to conduct a systematic deconstruction when conducting heritage research. According to the structure of the heritage corridor and the different distribution patterns of heritage clusters, the heritage system can be understood at the railway, town, and individual scales. Each scale of the heritage system exhibits distinct characteristics.

The heritage features at the railway scale emphasize the cultural route, its continuity, and the surrounding natural landscape matrix.

At the urban/town scale, the heritage features manifest as patterns of heritage collections within the town.

At the individual scale, the heritage features represent the historical, cultural, and aesthetic values of individual heritage sites.



heritage connection

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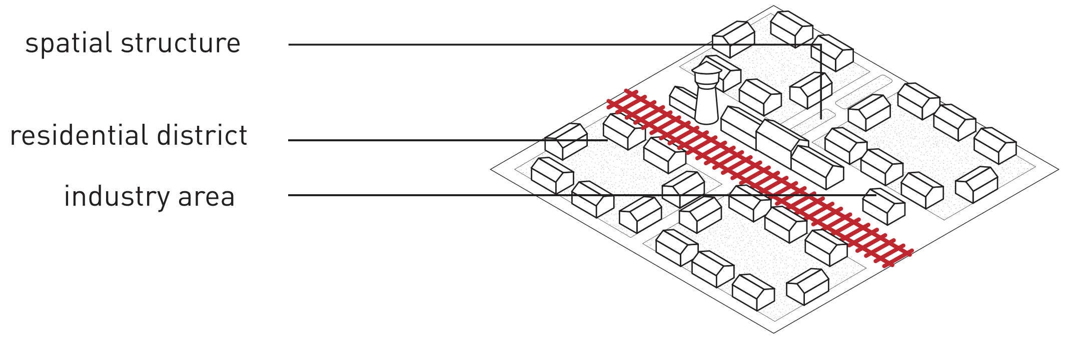

heritage collection

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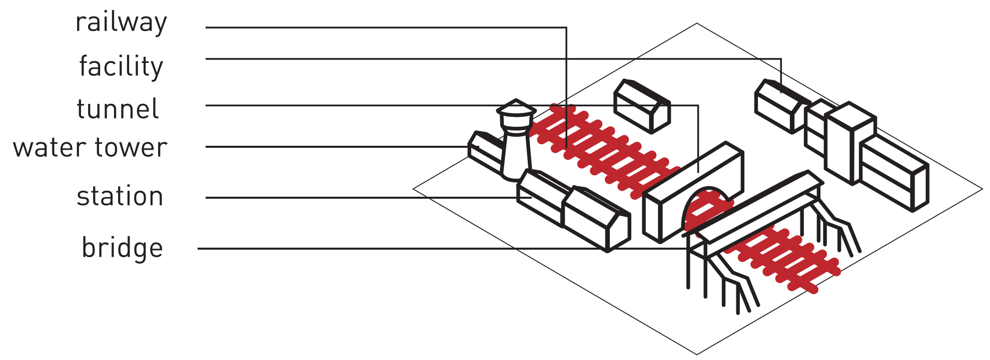

individual heritage

downloaded from: https://weibo.com/5906151643/NpwPFalEG

FIG. 1.16 CER heritage system/drawn by author

1.4 CER Heritage Protection

Long heritagization process

The heritage of the CER has been undergoing a continuous process of heritagization. In the ever-changing geopolitical environment, the railway routes, architecture, and facilities along them are continuously being expanded, demolished, renovated, and maintained. This represents a typical "palimpsest" phenomenon in the process of heritagization. (Li, Q., Liu, D. and Song, J., 2023) The railway routes and associated facilities have endured the Russian and Japanese colonial period, wartime, and the modern development era of China, accumulating marks of multiple historic and cultural narratives over the past century, making them precious cultural heritage. Despite their obvious heritage value, it was not until the 2000s that they began to attract widespread attention. Based on the certification and protection status of CER heritage, I have divided its development into three stages:

1990s-2006: Since the 1990s, modern cultural heritage has started to receive serious attention at the national level. Before this, many railway heritage sites had already been damaged or demolished during development. In the 1990s, There were a few historic buildings included in protection lists with less attention. And until 2006 some heritage sites in Heilongjiang Province were designated as national protected buildings.

2006-2013: After 2006, both society and the government placed greater emphasis on CER heritage. Large-scale surveys and documentation of the heritage began, among them hundreds of buildings being recognized as national protected buildings.

2013-current: The recognition and protection of CER heritage have continued to advance. After a large number of buildings were listed for protection in 2013, local provincial and municipal authorities also began to pay attention to heritage preservation and add more railway buildings to their respective preservation lists. In 2013, the Cultural Heritage Department issued recommendations to protect CER heritage as a linear heritage, marking the first time that protection measures were proposed from the perspective of the entire railway. In 2018, further recommendations on industrial heritage protection were introduced. And research on the CER heritage system and protection strategies increased. Although the destruction of heritage due to railway and urban development persists, awareness and efforts towards heritage preservation and development have significantlyimproved. As of 2019, more heritage sites continue to be nominated for inclusion in the national protected buildings list.

Although the destruction of heritage due to the railway and urban development persists, awareness and efforts towards heritage preservation and development have significantly improved. As of 2019, more heritage sites continue to be nominated for inclusion in the national protected buildings list

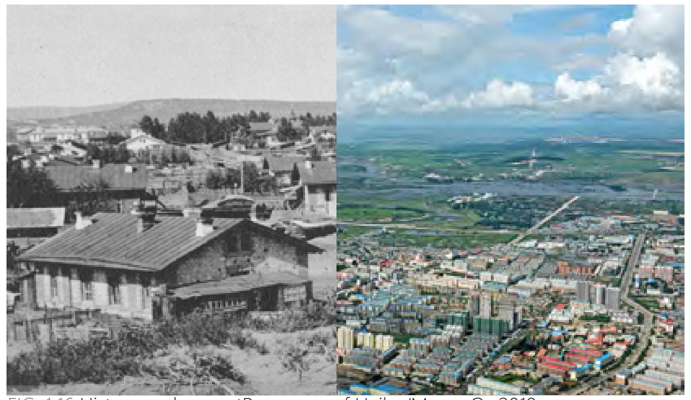

FIG. 1.16 History and currentPanorama of Hailar/Meng, Q., 2019

FIG. 1.17 Orthodox Cathedral of the Virgin Mary in Hengdaohezi/Photo downloaded from https://www.sohu.com/a/521652897_289742

FIG. 1.18 Railway station in Angangxi/Photo downloaded from https://weibo.com/5906151643/NpwPFalEG

FIG. 1.19 Locomotive apartments in Hengdaohezi/Photo downloaded from http://www.news.cn/photo/2021-09/16/c_1127868710_4.htm

1990 | 2006 | 2013 | now

Before preservation

Many historic buildings were demolished and the whole historic context disappeared.

Low awareness of the value of railway heritage

Only 7 heritage buildings are registered in the national protection list

Increased awareness of heritage protection

hundreds of heritage buildings are registered in the national protection list

Increased awareness of heritage planning and development

more surveys, report, research and development aboute railway heritage

1.4 CER Heritage Protection

Actual Protection Measures and Conditions

Current preservation policies mainly target individual historic buildings and historic districts/towns on two levels. For historic districts and towns, the government designates protective zones around them to preserve the townscape and restrict development within these areas. However, this approach often isolates heritage areas from the rest of the city, causing the local population to gradually shift their focus away from these areas, ultimately leaving them deserted. At present, only a few large cities, such as Harbin and Qiqihar, or a few well-preserved ancient towns, like Hengdaohezi, have such protection plans. Most historic buildings are listed individually and receive a certain degree of legal and policy protection. For example, all registered monuments are classified as immovable cultural relics, which legally prevents them from being arbitrarily demolished during urban development.

Registering and marking buildings is typically the first step, but the maintenance and restoration required for preservation are often not carried out promptly. The vast majority of monuments are neglected after being listed. This situation is partly due to inadequate government management and oversight and partly due to the complex and chaotic ownership issues that make restoration management challenging. Even in the few heritage sites that have undergone restoration, there are often destructive preservation measures. For instance, during the restoration of the Yimianpo Locomotive Depot, the original building floorings and internal structures were damaged, the tracks of the locomotive turntable were removed, and a large plaza and new high-rise office buildings were constructed on the original site, significantly affecting the appearance and integrity of the heritage cluster. These issues highlight the problems with current preservation policies, as the condition of most registered heritage sites remains concerning despite their legal protection.

Historic district in Angangxi

FIG. 1.20 Historic street in Angangxi/Photo: Fujia,L.,2020 downloaded from https://www.imharbin.com/post/53114

Historic district in Hengdaohezi

FIG. 1.21 Historic street in Hengdaohezi/Photo: Jianfei, X.,2021 downloaded from http://www.news.cn/culture/20210918/38d7cf71c58e46ed9c067d4825bc0676/c.html

"Mark" sign

FIG. 1.22 Protection sign/Photo downloaded from: https://touch.travel.qunar.com/comment/10160366958

FIG. 1.23 Protection Stone tablet/Photo downloaded from: https://www.ukanhao1.com/article/511920.html

Inadequate protection after marking

FIG. 1.24 Residential heritage building with sign/Photo downloaded from: https://down-files.2bulu.com/f/dn1?downParams=uZBpWlxK

FIG. 1.25 Abandoned barracks in Angangxi with stone tablet/Meng, Q.,2019

destructive preservation measures

FIG. 1.26 Former perspective from Locomotive turntable in Yimianpo/ Photo: Yizhi, Z.,2012 downloaded from: https://blog.sina.com.cn/s/blog_4ac20ab60102w9ju.html

FIG. 1.27 Current perspective from Locomotive turntable in Yimianpo/ Photo: Yizhi, Z.,2012 downloaded from: https://blog.sina.com.cn/s/blog_4ac20ab60102w9ju.htm

Former Czech Consulate in Harbin/Photo:Taken by author

2. Problem fields

2.1 Abandoned and neglected heritage

As I described in the motivation, whether from photos collected online or from firsthand inspection, most heritage sites appear to be in poor condition, often being idle, abandoned, or even demolished. The overgrown wastelands surrounding these heritage buildings indicate that they are neglected in urban or natural environments.

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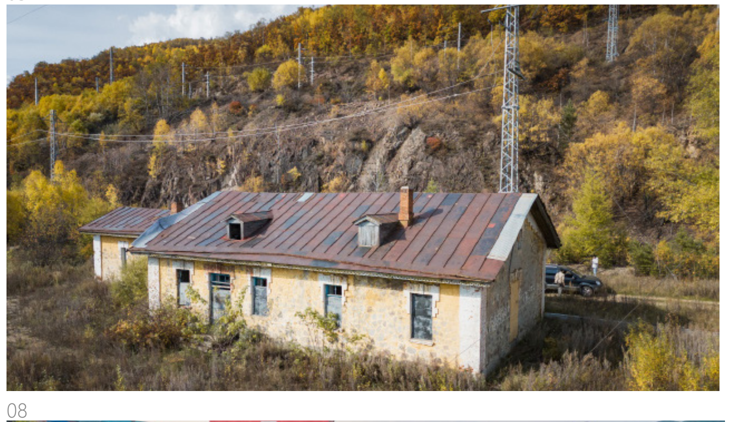

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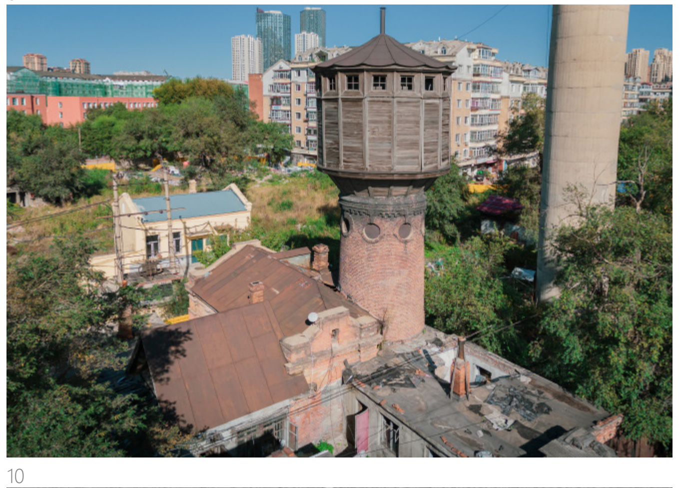

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FIG. 2.1 Abandoned and neglected heritage buildings photos

01 Shitouhezi Railway station/Photo downloaded from:

02&03 Stone arch bridges/Photo downloaded from: http://ljout.com/forum.php?mod=viewthread&tid=26860&aid=319384&from=album&page=1&mobile=no

04 Yimianpo Flour Mill/Photo downloaded from: https://weibo.com/1496834422/NgGYm7x2T

05 Russian station buildings in Xinnangou station/Photo downloaded from: https://weibo.com/5906151643/Nm22o71aU

06 FortiÞcation in Xinnangou station/Photo downloaded from: https://weibo.com/5906151643/Nm22o71aU

07 Water Tower in Xiangfang station/Photo downloaded from: https://weibo.com/5906151643/NmAGG2Klt

08 Locomotive Depot in Zhalantun/Photo downloaded from: https://weibo.com/5906151643/NoioTh6Wi

09 Police station in Boketu/Photo downloaded from: https://zhuanlan.zhihu.com/p/624492136

10 Historic houses in Yimianpo/Photo downloaded from: https://weibo.com/5906151643/Nn55N8zDt

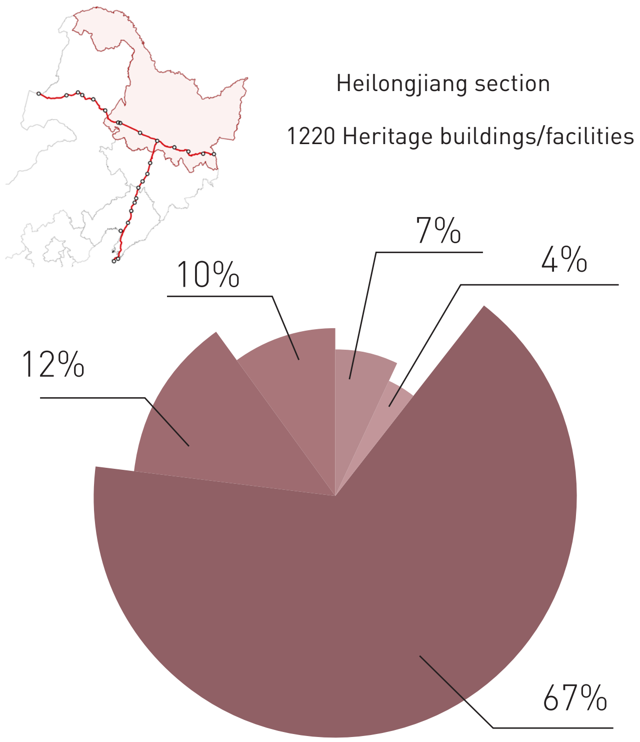
11 Former Czech Consulate in Harbin/Photo downloaded from: https://zhuanlan.zhihu.com/p/600390505?utm_id=0,%20https://weibo.com/5906151643/NqsbknfrB

12 FortiÞcation ruins in Fuerlaji/Photo downloaded from: https://weibo.com/5906151643/Nmv4Ypf0t

2.1 Abandoned and neglected heritage

According to a research paper published in 2023 on the heritage status of the Chinese Eastern Railway's Heilongjiang section (which encompasses nearly half of the railway heritage along the whole railway, the statistical data indicates that there are relatively few well-preserved heritage sites currently in active use. (Peilun, L., et al., 2023)

The data show that most heritage sites are unused, and those that are idle have suffered some damage and require restoration. Nearly a quarter of these sites have structural issues. The inadequate heritage protection measures discussed in the previous section are undoubtedly a direct cause of this situation. Heritage sites are often only registered without subsequent protection, and there is insufficient awareness from various stakeholders.



Report about Status of Preservation of Heritage along the CER

7%

- Intact structure
- minimal exterior damage
- distinctive architectural style and complete layout
- **original functionality maintained**

Xiangfang Station House
downloaded from:https://www.163.com/dy/article/G84C58NJ052198BL.html

4%

- Intact structure
- minor exterior damage
- distinctive architectural style and layout mostly intact
- **currently in use**

Harbin CER museum
downloaded from: https://weibo.com/ttarticle/p/show?id=2309404559885739098202

-90% of the heritage buildings are in unused state

-23% of the heritage buildings have structural issues

67%

- Mostly Intact structure
- some exterior damage
- distinctive architectural style missing but restorable, complete layout
- **currently unused**

Russian-style residence
downloaded from: https://www.163.com/dy/article/G3E7SS3J0524AJI5.html

12%

- Structural issues
- half of the exterior damaged
- architectural style altered and layout missing
- **currently unused**

Fan-shaped Locaomotive Garage
downloaded from: https://weibo.com/5906151643/NoioTh6Wi

10%

- Structural issues
- Risk of collapse
- **currently unused**

Guxiangtun Station house
downloaded from: https://www.imharbin.com/post/49989

FIG. 2.2 Research data about Status of Preservation of Heritages along the CER

2.2 Problems through scales

"Industrial heritage consists not only of production sites, but also includes workers' residences, transportation systems used, and social gathering places. While each of these elements holds value, their true significance can only be highlighted within the framework of the overall landscape. Additionally, it is through this framework that we can study the interconnections among these factors. ***The concept of the overall landscape is crucial for understanding industrial heritage.****"*

– Louis Bergeron

According to the report, nearly 90% of the heritage sites remain unused. It is often said that utilization is the best form of protection, so what are the reasons for the abandonment and neglect of these heritage sites, and why have subsequent protection and development measures not been implemented in time? Can we find some spatial issues except protection policy? like in the photos, apart from the physical condition of the heritage itself, we can observe a desolate surrounding environment with low spatial quality, is this one of the reasons that people are not aware of heritage sites?

To identify the issues, it is essential to place the heritage sites within a comprehensive landscape spatial framework. This is especially crucial for CER heritage, which involves a complex system of interrelated influences across different scales.

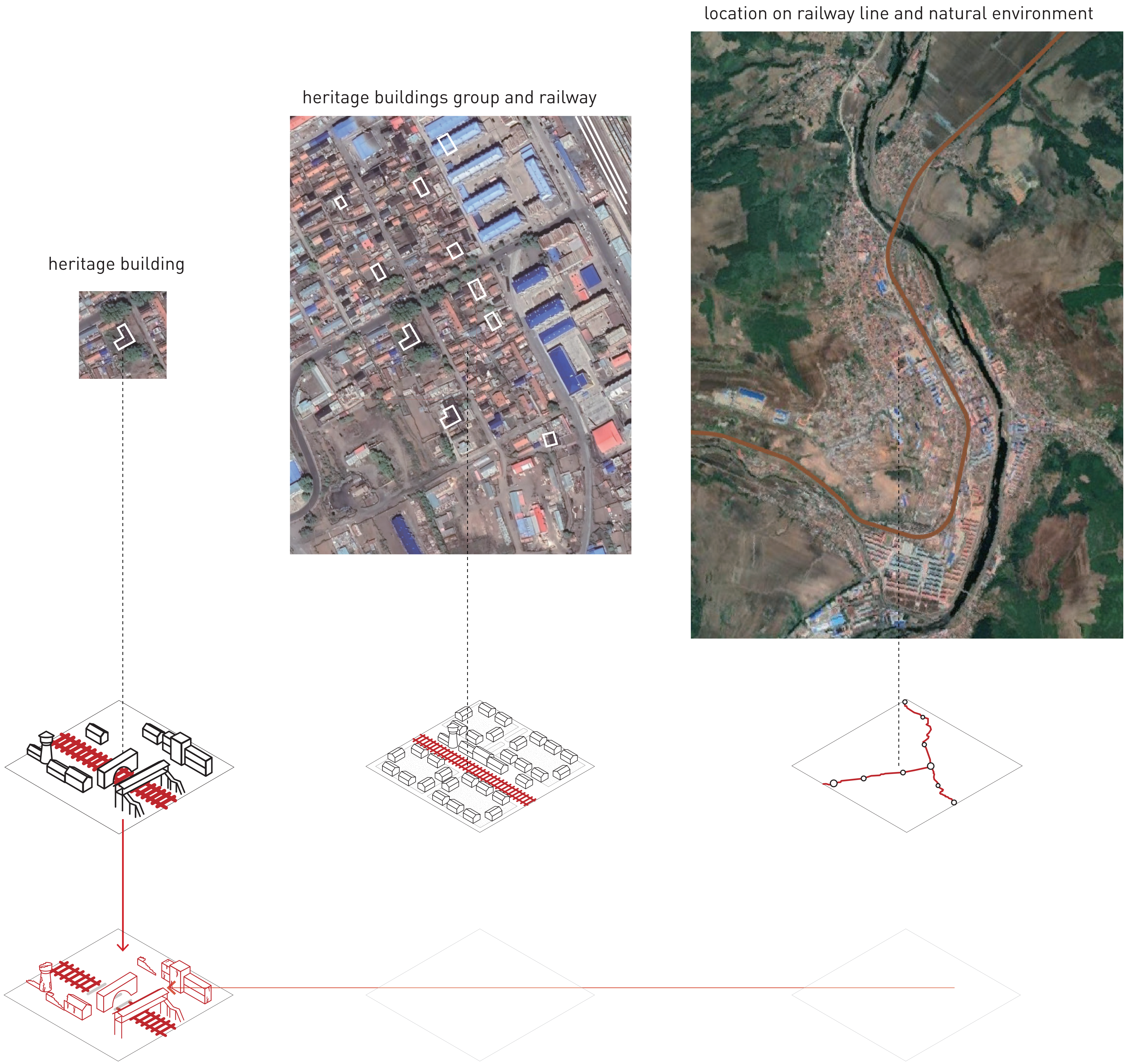


FIG. 2.3 Problems through different scales/drawn by author(base map: Google Earth)

2.2.1 Urban scale——losing identity and perception

Along the CER route, there are numerous heritage urban patches. After a century of development, the situation in each town varies, making it difficult to summarize. However, **a common problem in most urban patches is that due to the impact of current construction and development, the historical environment and pattern of the heritage site have been affected, weakening or demolishing heritage identity within urban areas, posing challenges to people's perception and understanding. This exacerbates neglect, abandonment and even demolishment of heritage since unseen heritage is likely to not receive adequate protection, supervision, and development opportunities**.

Here I list 3 manifestations of this problem I found during research: **Fragmented, Isolated and Concealed.**

perceive heritage buildings in 1900s

FIG. 2.4 Street views in 1900s/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

perceive heritage buildings in the current urban environment

FIG. 2.5 Street view nowadays/Photos: taken by author

Fragmented **Isolated** **Concealed**

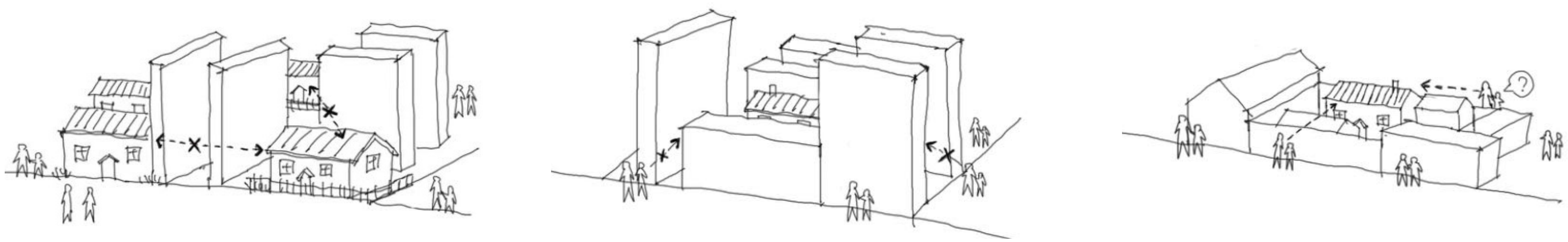


FIG. 2.6 Three situations/drawn by author

2.2.1 Urban scale——losing identity and perception

Fragmented is easy to understand: new constructions replace original heritage buildings, encroaching on historic districts and breaking them into fragments. Take Suifenhe as an example: many historic neighborhoods have been occupied by newly constructed high-rise buildings. Historic buildings have been demolished, and heritage blocks have been fragmented into irregular patches, with only scattered individual buildings remaining in some areas. As shown in the image, compared to the historical streetscape, one can now only see a solitary historic building, and people's perception of heritage buildings and districts has become more discontinuous. These scattered individual buildings, interspersed among high-rise buildings, weaken their heritage identity and are harder to perceive.

street view in 1900s

FIG. 2.7 Hengdaohezi street view/The Construction Album of Chinese Eastern Railway (1897-1903), 1905

FIG. 2.8 Suifenhe street view/The Construction Album of Chinese Eastern Railway (1897-1903), 1905

Suifenhe historic pattern map

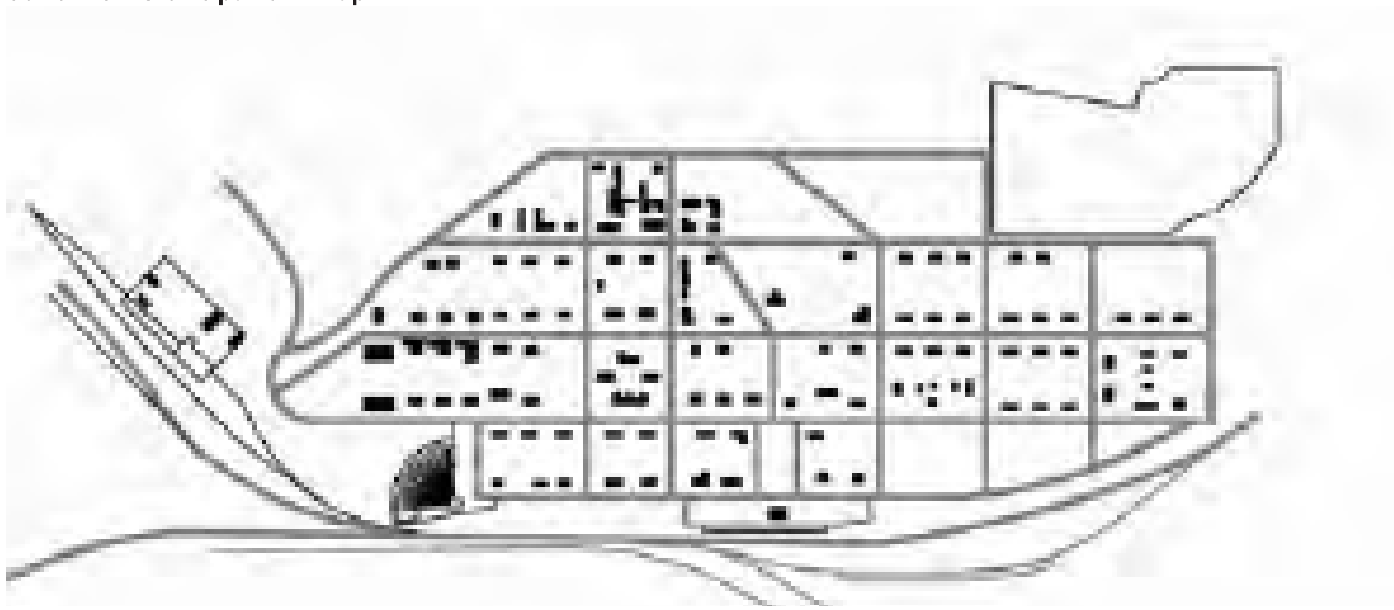
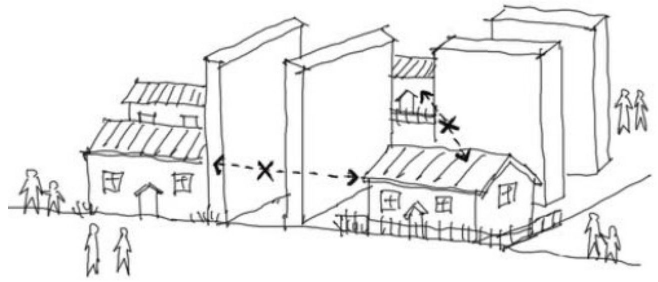


FIG. 2.9 Suifenhe historic map/The Engineering of Chinese Eastern Railway (1897-1903), 1904

Fragmented



street view in 2024

FIG. 2.9 Suifenhe street view of one heritage building/Photo: taken by author

FIG. 2.10 Seeing one heritage district in Suihenhe through fence/Photo: taken by author

Suifenhe current heritage map

FIG. 2.11 Map of perserved heritage buildings in Suifenhe /drawn by author(base map: Google Earth)

2.2.1 Urban scale——losing identity and perception

Isolated refers to heritage areas that lack connection and interaction with the surrounding urban structure, thereby becoming isolated islands, like enclosed heritage districts, heritage buildings surrounded by high buildings, and heritage buildings on the edge of town. Take the heritage district near the railway as an example, the small heritage area in Shangzhi city is nearly surrounded by factories and railways, with only one backstreet connecting it to the main urban area. Few people would notice the presence of railway heritage here. Also, the water tower in Harbin near the railway was surrounded by barren areas with no clear connection with urban streets.

street view along the railway in 1900s

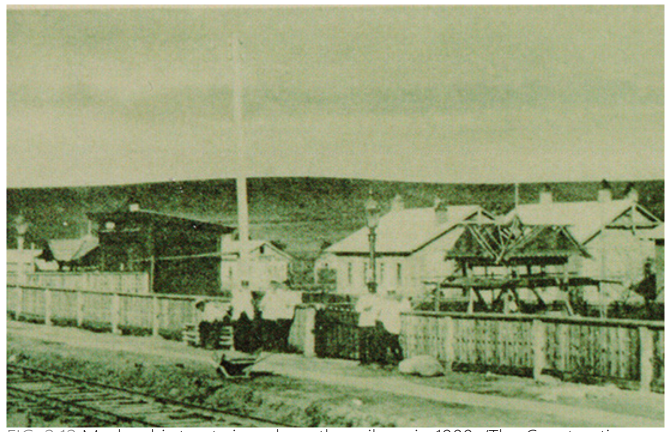


FIG. 2.12 Modaoshi street view along the railway in 1900s/The Construction Album of Chinese Eastern Railway (1897-1903), 1905

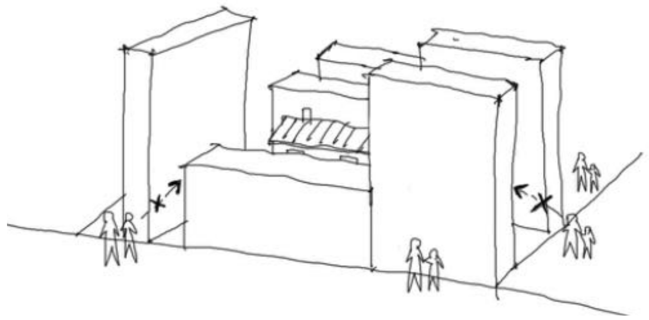
street view along the railway in 2024

FIG. 2.13 Current Shangzhi street view along the railway/ Photo: Baidu street map

Shangzhi heritage district beside railway

FIG. 2.14 One Isolated heritage district beside railway in Shangzhi/drawn by author(base map: Google Earth)

Isolated



view towards the water tower in 1900s

FIG. 2.15 view towards the water tower in Mudanjiang in 1900s/downloaded from: http://mt.sohu.com/20171025/n519871731.shtml

view towards the water tower in 2024

FIG. 2.16 cuurent view towards the water tower in Xiangfang/Photo: Haowen, Z. downloaded from: https://www.163.com/dy/article/FEN6VVD20543HKST.html

Xiangfang heritage site beside railway

FIG. 2.17 Water tower along the railway in Xiangfang station/drawn by author(base map: Google Earth)

2.2.1 Urban scale——losing identity and perception

Concealed is the most common issue within heritage urban patches. Building block along CER consisted of a house accompanied by a large courtyard, enclosed by low walls or wooden fences. During that period, houses and courtyards were clearly visible from the streets. However, with urban development, courtyards have gradually been filled with new constructions, and tall walls have been erected, greatly obstructing the sightlines. As a result, heritage sites are obscured within, making it difficult to see them as clearly as before, which is most common in township heritage areas.

Concealed

residential street view in 1903

FIG. 2.18 residential street view/The Construction Album of Chinese Eastern Railway (1897-1903), 1905

FIG. 2.19 Hengdaohezi residential view in 1900s/The Construction Album of Chinese Eastern Railway (1897-1903), 1905

residential street view in 2024

FIG. 2.20 Current residential street view in Yimianpo/taken by author

FIG. 2.21 Current residential street view in Yimianpo/taken by author

Historic building block

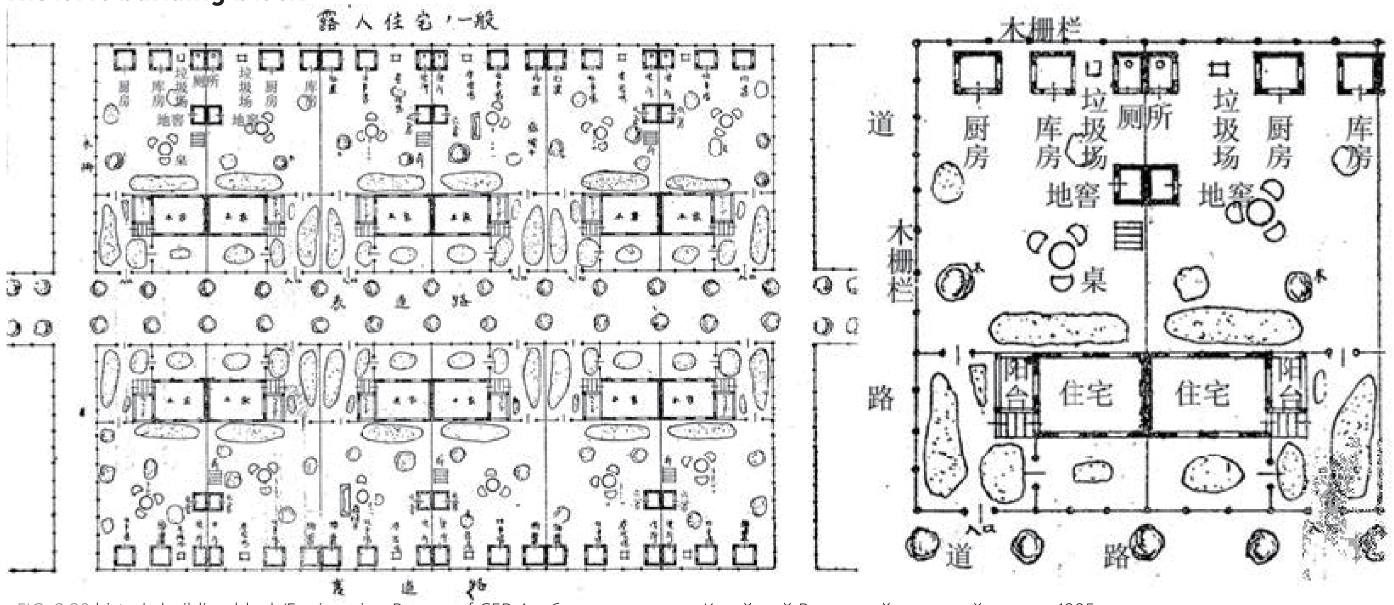


FIG. 2.20 historic building block/Engineering Bureau of CER Альбом сооружения Китайской Восточной железной дороги 1905

Heritage building block in Yimianpo town

FIG. 2.21 Current building blocks in Yimianpo/drawn by author(base map: Googlr Earth)

2.2.2 Railway scale——less accessibility and usability

Due to the direct correlation between heritage along the railway and the construction, operation, and development of the railway itself. This creates a domino effect where any alteration and any changes to the railway infrastructure have a direct impact on the adjacent heritage sites and even towns/villages along railway. There are generally three situations in which railway heritage sites become disused and abandoned due to the loss of their practical function.

Abandoned railway lines: The original lines were replaced by more convenient, faster, and more profitable railway lines. For example, there were numerous spiral loops constructed along railway lines in early times to traverse hilly terrain and mountains. However, with technological advancements leading to the construction of more convenient straight tunnels, these spiral loops, which were slower in speed and difficult to maintain, were eventually abandoned. Consequently, the stations along the route, railway work areas, and some residential areas for employees were left deserted.

Discontinued stations: Some railway lines continue to operate normally, but many train stations in surrounding towns along the route have been canceled, leaving historic station areas along the line in a state of disuse and abandonment.

Obsolete engineering facilities: Over the past century, locomotives have undergone several upgrades, from steam locomotives to internal combustion locomotives and then electric trains. As a result, iconic structures along railway lines water towers (used to supply water to steam locomotives), have become obsolete and abandoned. Additionally, some bridges, tunnels, and other engineering facilities have been abandoned or demolished due to non-compliance with modern standards.

In addition to directly affecting the function of railway heritage, the iterative development of railways has also reduced the accessibility of towns along the line from the perspective of the entire region, further reducing the accessibility of heritage sites. The abandoned lines and the areas where the canceled stations are located in relatively remote towns. In some places where public transportation and infrastructure are not very convenient, and railways are the only cheap and convenient means. After the railways are no longer in operation, these places are more difficult to reach, which also indirectly affects the economy and population. Many formerly bustling towns have gradually become quiet after the cancellation

Abandoned railway section on Musui line

FIG. 2.23 Musui line/Photo: taken by author

Abandoned station on Musui line

FIG. 2.24 Daguanling station/Photo: taken by author

FIG. 2.22 Abandoned railway sections and stations along Binsui Line/drawn by authot(base map: Google Earth)

2.2.3 Social background: Economic decline and Population loss

The cultural and economic background of railway corridor regions, as intangible dimensions, influences people's awareness and preservation of heritage.

The chart shows that since the 1960s, the GDP and the proportion of the permanent population of Northeast China relative to the national total have been gradually declining, returning to levels seen fifty years ago by 2021. Economic growth and population growth rates in the region have lagged behind the national averages, demonstrating a long-term economic downturn and population loss in Northeast China. This has manifested in heritage preservation through government-led protection and development efforts often being constrained by funding limitations. Balancing the region's economic development needs with those of the residents has led to delays in heritage preservation measures.

This issue is more pronounced in impoverished and desolate towns, where economic investment and construction are harder to accommodate, leading to high rates of urban migration among residents. Many privately-owned heritage homes are left vacant. During my field research, I also found that even during the Spring Festival, when many people return to their hometowns, some heritage buildings remain vacant with signs indicating they are for sale.

The proportion of GDP of the Northeast Region to the national GDP(1952-2021)

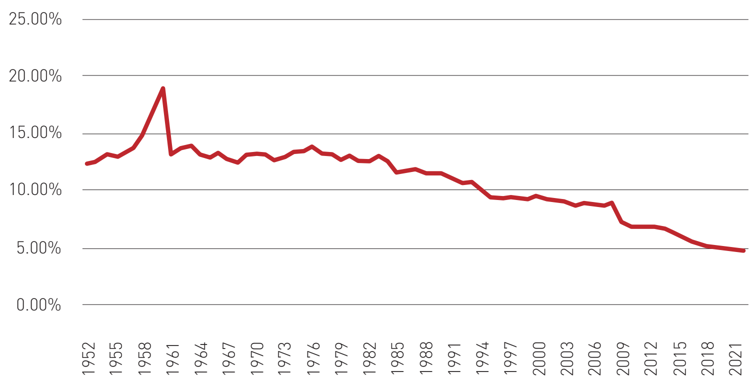


FIG. 2.24 The proportion of GDP of the Northeast Region to the national GDP(1952-2021)/redrawn by author(data from https://m.huxiu.com/article/2280761.html)

The proportion of the permanent population of the Northeast region to the national population(1949-2018)

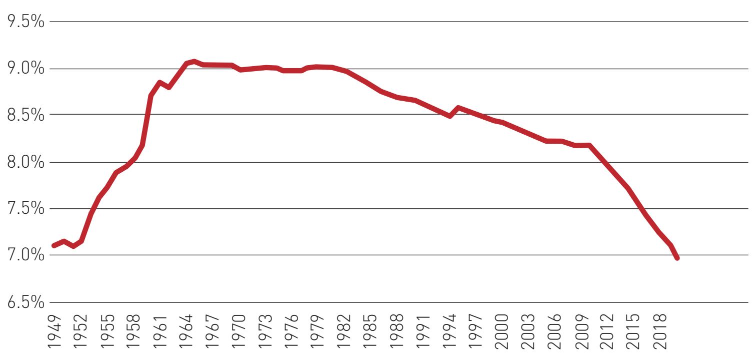


FIG. 2.28 The proportion of the permanent population of the Northeast region to the national population(1949-2018)/redrawn by author(data from https://www.thepaper.cn/newsDetail_forward_16136416)

Vacant heritage buildings

FIG. 2.26 The paper at the door writes "selling the house"/Photo: taken by author

FIG. 2.27 A house that looks long abandoned/Photo: taken by author

Heritage without adequate protection and management

FIG. 2.29 Former Czech Consulate in Harbin with Extensive facade damage/Photo: taken by author

FIG. 2.30 Demolished heritage buildings in Harbin/Photo: Fei, G.,2018

2.3 Current heritage development

The scope and scope of the conservation and development of the CER heritage has been increasing since 2013 when it was recognized as an important linear industrial heritage, but due to the large number and span of heritage sites, in addition, economic factors and improper development concepts lead to development still exist many problems.

Firstly, the majority of development measures are still based on the reuse of individual heritage buildings. Repairing heritage buildings and then showcasing them statically is the most common practice. Buildings no longer serve functional purposes but stand in the city like monuments, where people can only admire their external architectural style. There are a few heritage buildings that are reused after restoration, but most of them are transformed into museums.

Secondly, from the perspective of development focusing on heritage building blocks, currently, only the small town of Hengdaohezi has relatively successful and comprehensive planning and development. This includes restoring heritage buildings, improving street environments, and introducing new businesses such as tourism and wellness services, all while integrating these developments with the local residents' use of heritage buildings.In contrast, most other heritage districts, despite undergoing restoration and preservation, remain largely inactive or hidden behind protective barriers. The heritage buildings, in essence, have not been repurposed and remain isolated from the urban fabric and daily urban life, exacerbating their neglected state.

In terms of the overall pattern of the railway heritage corridor, there is no more official heritage policy to coordinate the regional scale of the heritage system, so the heritage development is fragmented and uneven pattern. Different regions have different awareness and intensity of development. At present, large cities and towns with more developed economies and rich heritage resources are more likely to get development opportunities by combining heritage resources with urban economic development, but some relatively remote backward villages and towns heritage abandoned situation is more serious.

For heritage buildings: Static Exhibits and museums

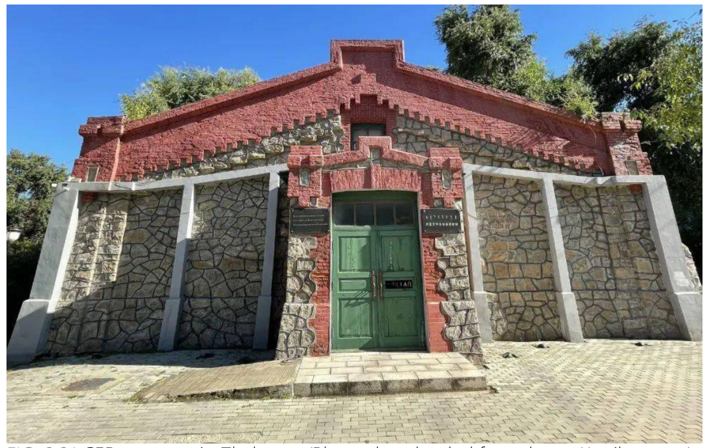


FIG. 2.31 CER museum in Zhalantun/Photo downloaded from: https://weibo.com/ttarticle/p/show?id=2309404559885739098202

FIG. 2.32 CER museum in Hengdaohezi/Photo downloaded from: https://www.163.com/dy/article/GVPIL4IT0524A0GE.html

FIG. 2.33 Another CER museum in Hengdaohezi/Photo downloaded from: http://www.360doc.com/content/21/1112/09/26561818_1003812371.shtml

FIG. 2.34 CER museum in Harbin/Photo downloaded from: https://travel.sohu.com/a/695602489_121124419

FIG. 2.35 CER museum in Suifenhe/Photo downloaded from: https://www.mafengwo.cn/i/18201601.html

For heritage buildings blocks: Isolated districts

FIG. 2.36 Suifenhe Enclosed Heritage District/Photo: taken by author

FIG. 2.37 Anda Enclosed Heritage District/Baidu street map

2.4 Problem statement

By placing the heritage within a holistic spatial framework and performing a comprehensive hierarchical problem analysis of the heritage corridor, it can be clearly seen that spatial issues from different scales directly or indirectly affect the status quo of the heritage

From the point of view of the urban background, there is a space problem between the heritage patch inside the town and the current urban structure, fragmented, isolated, and concealed, which weakens the identity and perception of the heritage. The change of the historical environment and the destruction of the pattern, as a result, the heritage which had been seen in the main line of sight disappeared and was ignored by people, indirectly affecting the destruction and the abandonment of heritage. From the point of view of the railway context (regional context), the development and iteration of the railway have led to the loss of function and abandonment of many heritage buildings and facilities, as well as to a decrease in the regional accessibility of heritage sites, it also has a negative impact on the economy and the population. Finally, the social context reflects the serious lag in heritage protection and development measures due to the economic and demographic problems of lead to.

Current development measures pay more attention to the reuse of old building functions, while the design strategy from the town and regional scale is less. **Therefore, by adopting a landscape perspective at a larger scale, this project aims to improve spatial issues of heritage from urban and regional contexts to reveal the existence and value of heritage, facilitating its reuse and development on a larger scale, thereby reversing the current state of abandonment and neglect and revitalizing railway corridors.**

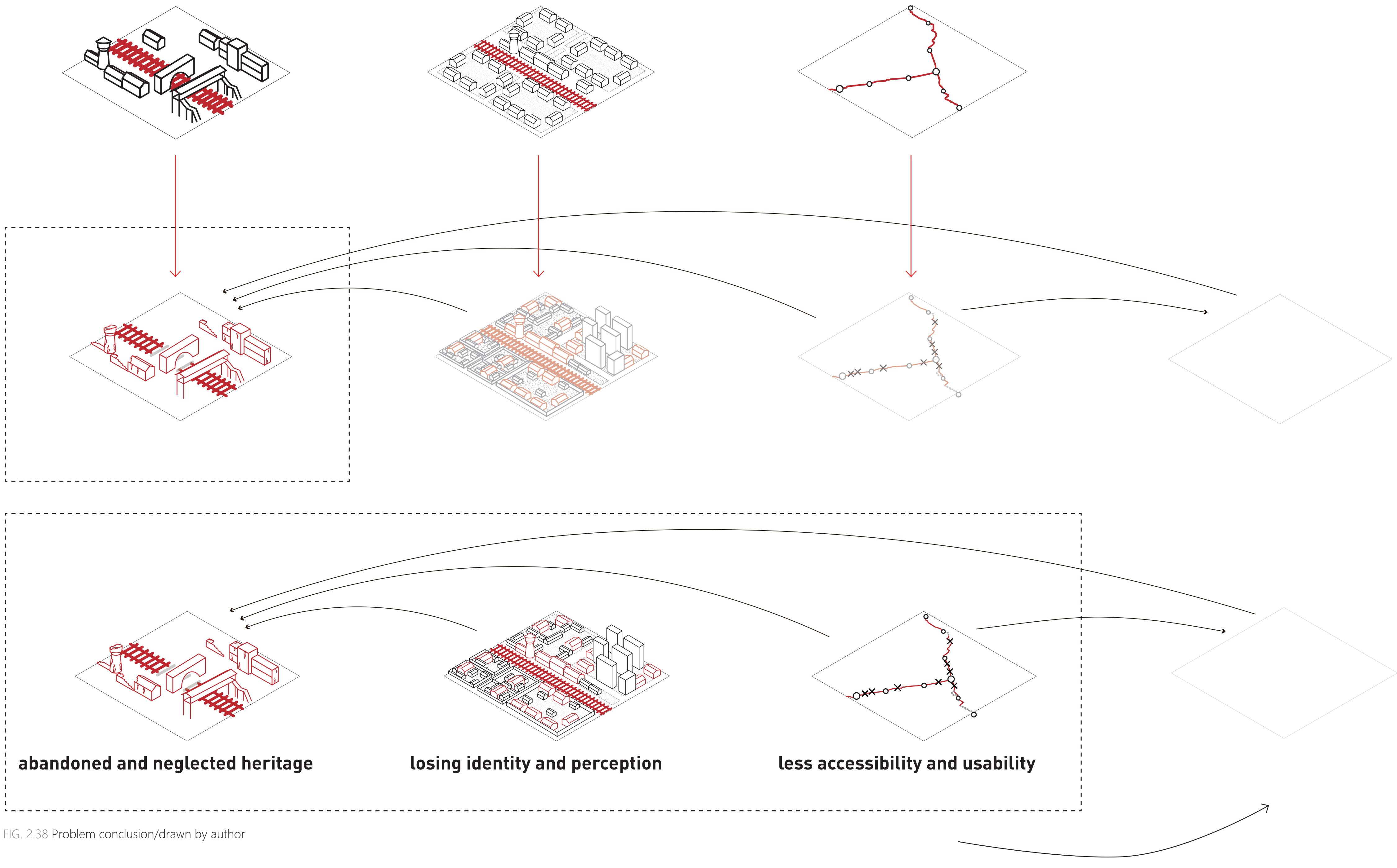


FIG. 2.38 Problem conclusion/drawn by author

Hengdaohezi town perspective, downloaded from: http://www.hljghxx.com/index.

3. Methodology

3.1 Design and research question

How to reveal and revitalize the abandoned and neglected Chinese Eastern Railway heritage from the landscape perspective?

KEY WORDS	SUB-QUESTION
reveal and revitalize	How can the current existence of concealed and forgotten CER heritage be revealed and made public revitalized? What strategies can develop and enhance the functional qualities of a heritage site to make it a vibrant and attractive place?
landscape perspective	What's the relationship between landscape and architectural heritage preservation? What kind of landscape (spatial) design interventions can achieve the above goals from urban and regional landscape contexts?

3.2 Theoretical background & Case study

Heritage Corridor

There are two main understandings of Heritage Corridor. One is that it is a particular type of heritage, represented by canals and transportation routes, such as the CER Heritage Corridor, the other represents an approach to heritage conservation that combines heritage areas and greenways. (Fei,G.,2018)In 1993, Schwaz and others first defined heritage corridors in their work, considering that the heritage corridor is similar to and corresponds to the green corridor, "Heritage Corridor is a linear landscape, is a collection of unique cultural resources. Heritage corridors typically have a clear economic focus, using means and measures such as tourism incentives, adaptive tourism, and adaptive re-use of old buildings, with the consequent improvement of recreational facilities and the environment, and the technologies, designs, and methods used for green corridors, which also apply to heritage corridors."

From the definition, we can see that the heritage corridor adopts the concept of heritage as a whole as a regional area, taking into account the multiple objectives of nature, economy, and culture. (Fei,G.,2018)For example, Black Stone Vallet Heritage Corridor, a National Heritage Corridor showing the history of the early American Industrial Revolution, including mill towns stretching across 25 cities and towns (400,000 acres (1,620 km2) in total) near the river's course in Worcester County, Massachusetts, and Providence County, Rhode Island. (Wikipedia)Some areas have been protected and transformed into National Historic Parks, and a range of industrial heritage sites have been transformed into visitor centers and museums, while multi-purpose greenways have been built along the corridors to provide ample historical, cultural, and natural experience.

Therefore, scholars have categorized the elements of heritage corridors into three systems: the heritage system, the natural system, and the support system. Heritage corridors encompass not only the resources of the heritage itself but also the integration of multiple systems, including the natural resources in which the heritage is situated, the transportation system and the interpretation systems that provide the tourism service experience.

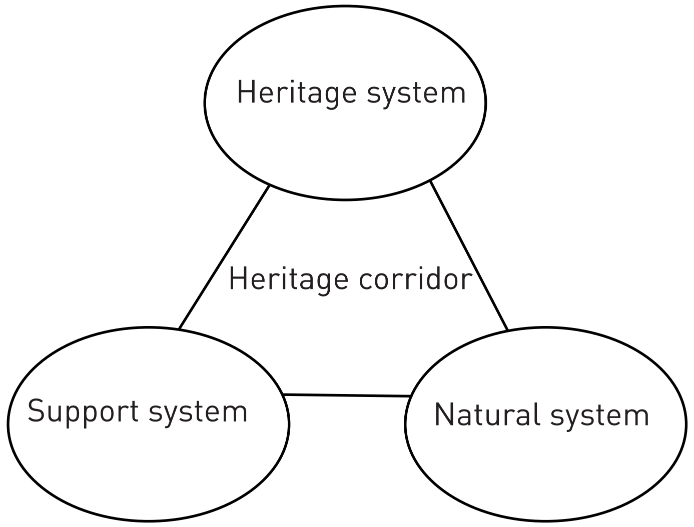


FIG. 3.1 Heritage corridor system

Blackstone Valley Heritage Corridor

FIG. 3.2 Black stone valley map/downloaded from: https://upload.wikimedia.org/

RIver bikeway

Historic park

National park

FIG. 3.3 Black Stone Valley Heritage corridor/Photos downloaded from: https://blackstoneheritagecorridor.org/

3.2 Theoretical background & Case study

Heritage Corridor

Case study: Revitalizing the Great Wall——Datong Ancient Great Wall Cultural Heritage Corridor in Shanxi Province, China

The Datong Ancient Great Wall was mainly built in the Ming Dynasty (AD 1368-1644), and despite of all vicissitudes over history, its main parts have managed to remain till today.

Challenges:
1.Poor condition: Due to its scattered distribution, the ancient Great Wall sites do not have a continuous protection area. Most areas of the Great Wall lack management.

2.Ecological environment: The ecological environment is fragile and the vegetation is sparse. In the Ming Dynasty, burning destroyed the ecological environment around the Great Wall, and even part of the Great Wall collapsed due to soil erosion.

3. Transportation system: The absence of a continuous transportation system along the Great Wall hampers the effective development and utilization of its resources.

4. Social Economy: Low economic benefits of agriculture and the poverty of rural people, local communities are also facing the dilemma of the outflow of young people.

Planning strategy:
1. Heritage protection: Through analysis, it was found that most of the high-quality sites are distributed within 1,000 meters of the Great Wall. Based on this situation, the team determined the spatial pattern of the site corridor planning: **Core protection area, Ecological restoration area, Tourism service area, Development coordination zone**

2. Ecological restoration: Identify ecologically sensitive areas and establish low-maintenance vegetation communities, and provides habitats for endangered species.

3. Tourism Facilities System: The master plan plans to build a 255-kilometer sightseeing route and bicycle path system to unify the Great Wall into an organic whole. Service centers will be set up in 12 scenic spots along the way to establish a continuous tourism service facility system.

4.Industrial Guidance: Guide rural residents to other types of cash crops and moderately develop mature ancient villages to develop a series of tourism services.

Datong Great Wall

FIG. 3.4 Datong Great Wall/downloaded from: https://www.gooood.cn/2019-alsa-analysis-and-planning-honor-award-revitalizing-the-great-wall-datong-ancient-great-wall-cultural-heritage-corridor-in-shanxi-province-china-by-blla-and-beijing-forestry-university.htm?lang=en

Master plan

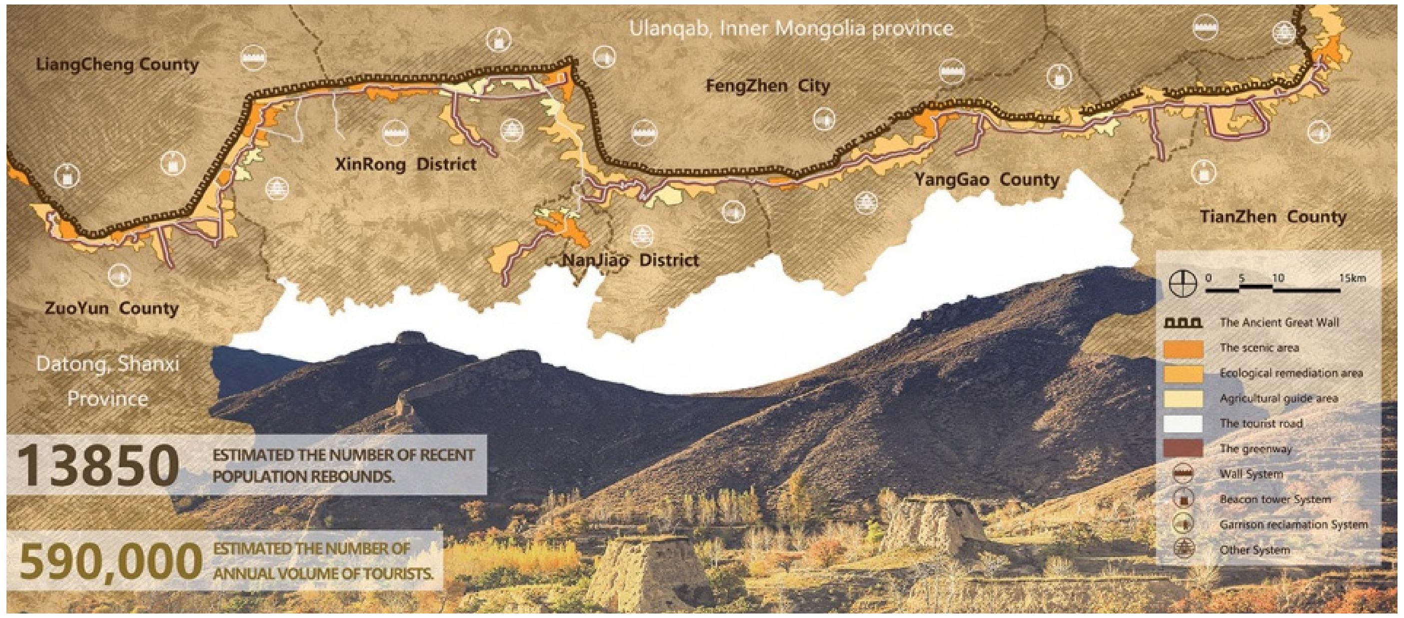


FIG. 3.5 Master plan/downloaded from: https://www.gooood.cn/2019-alsa-analysis-and-planning-honor-award-revitalizing-the-great-wall-datong-ancient-great-wall-cultural-heritage-corridor-in-shanxi-province-china-by-blla-and-beijing-forestry-university.htm?lang=en

Conclusion:
The Great Wall heritage corridor, sharing a similar structure with the CER heritage corridor, also encounters comparable challenges in heritage protection and social issues. Thus, the development approach for this heritage area offers valuable insights for the design of the CER heritage corridor.

-connecting scattered heritage sites into a cohesive whole and establishing a series of tourist facilities along the route.
-Designating ancient towns and villages near the Great Wall as scenic areas, restoring natural terrain and vegetation, and planning public spaces and other tourist amenities.

3.2 Theoretical background & Case study

Historic Urban Landscape Approach

Building upon the review of the UNESCO Vienna Memorandum, an updated definition of HUL was agreed upon and fine-tuned in February 2010 at a planning meeting in Paris for the drafting of the first text of the new Recommendation on Historic Urban Landscape. "The Historic Urban Landscape is the urban settlement understood as a historic layering of cultural and natural values, extending beyond the notion of "historic centre" or "ensemble" to include the broader urban context and its geographical setting. This wider context includes the site's topography, geomorphology and natural features; its built environment, both historic and contemporary; its infrastructures above and below ground; its open spaces and gardens; its land use patterns and spatial organization; its visual relationships; and all other elements of the urban structure. It also includes social and cultural practices and values, economic processes, and the intangible dimensions of heritage as related to diversity and identity. (UNESCO, 2009)

Using Muling Town along the CER as an example, in addition to the historic railway station, the historic townscape also focuses on the spatial organization of this small town, such as the grid-like road patterns, land use patterns, and the natural backdrop of the town, such as the undulating hilly terrain visible in the background of the photograph.

The concept of historic urban landscape expands the understanding of heritage sites beyond individual buildings to include streets, open spaces, and the natural background of historic towns, which also contribute to the heritage identity. Therefore, the spatial environment of non-heritage entities is crucial for the perception and experience of heritage, highlighting the need for landscape improvements in heritage protection and development.

The protection of the historic urban landscape is a dynamic process that requires the sustainable development of the city, the participation of multiple stakeholders, respecting the historical context, ensuring stakeholders involved,improving the quality of the urban living environment, and promoting social and economic transformation and growth.(UNESCO, 2009)

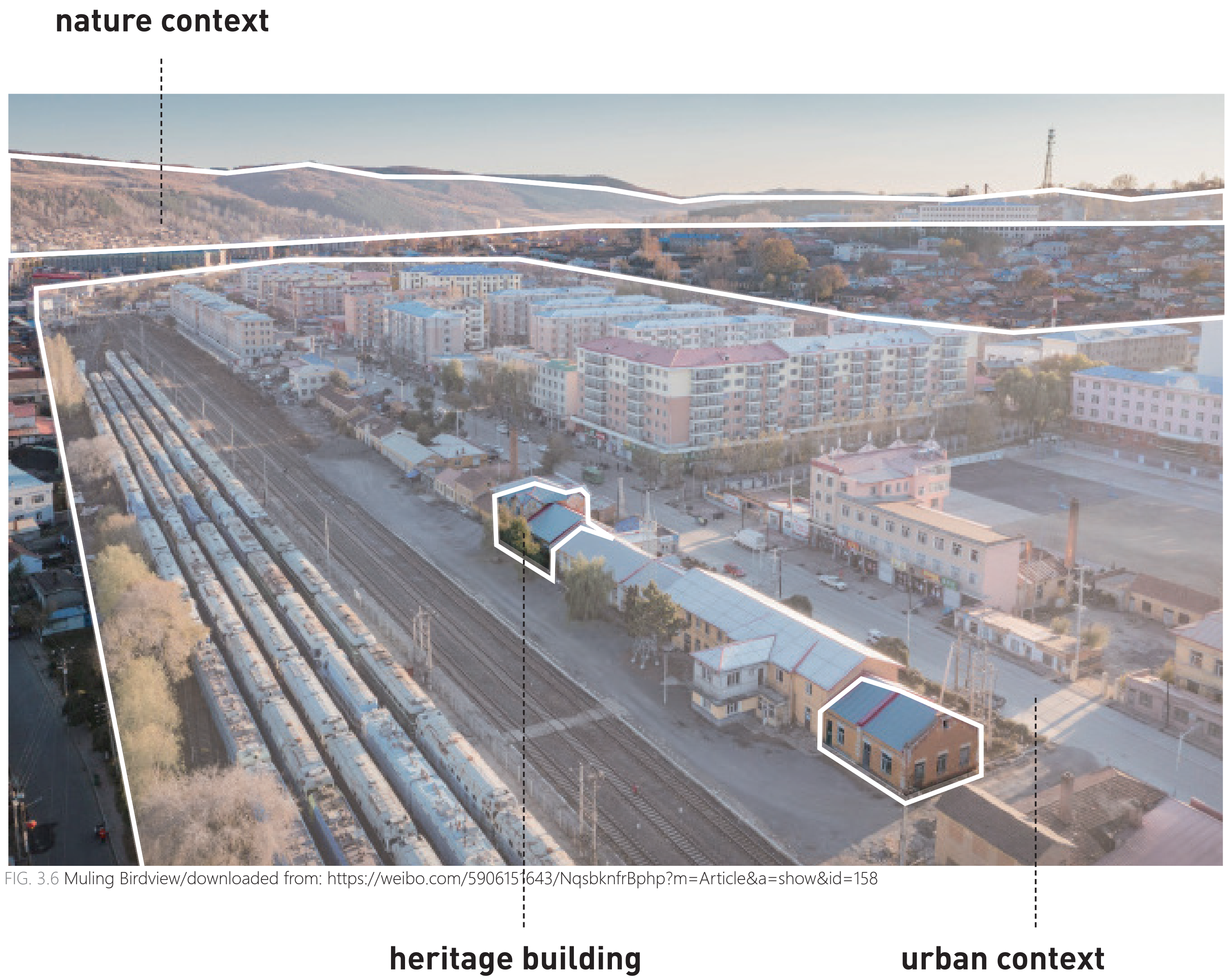


FIG. 3.6 Muling Birdview/downloaded from: https://weibo.com/5906151643/NqsbknfrBphp?m=Article&a=show&id=158

3.2 Theoretical background & Case study

Historic Urban Landscape Approach

Case study: Hengdaohezi historic town planning, China

Hengdaohezi Town in Hailin City, established in 1897, is a "garden town" that developed alongside the construction of the CER. The town currently has five nationally protected heritage sites and 114 Russian-style buildings, making it the most heritage-rich and well-preserved town along the Chinese Eastern Railway. However, a new wave of urbanization poses a threat to these historically and culturally significant railway buildings.

Planning strategy:

From town planning perspective

1. Protect the overall pattern of the town and strictly control the overall construction height and skyline

2.Divide the protection area into three levels according to the distribution of cultural relics buildings. In principle, no new buildings shall be built within the core protection area, and the style, volume, color and height of new buildings shall be strictly controlled within the construction control zone.

3. Focus on strengthening the protection and reinforcement of the cultural relics protection units

From historic buildings perspective

Evaluate the value characteristics and current status of cultural relics buildings, divide the buildings within the core protection area into five types according to their value characteristics and intactness, and formulate detailed remediation measures for each type.

Conclusion:

This case demonstrates how to protect and develop heritage from the perspective of town planning. From an urban design standpoint, it is crucial to preserve the historic layout and texture of the town, limit the skyline, and control development intensity. Additionally, comparisons of pre- and post-renovation images reveal that the project also improved the open spaces surrounding heritage sites, such as restoring historical streets, repaving, and enhancing the previously barren environment. The implementation of the planning has further enhanced the town's reputation. Its historic landscape has attracted film and television productions, drawing in tourists and boosting the local tourism industry. This provides a good reference for the development of similar towns and districts along the railway line.

Master plan

FIG. 3.6 Hengdaohezi master plan/downloaded from: http://www.hljghxx.com/index.php?m=Article&a=show&id=158

Before and after

FIG. 3.7 Before and after/downloaded from: http://www.hljghxx.com/index.php?m=Article&a=show&id=158

3.2 Theoretical background & Case study

Historic Urban Landscape Approach

Case study: Pearling pathway, Muharraq

The Bahrain Pearling Path is a serial cultural heritage site inscribed on the UNESCO World Heritage List on June 30, 2012. It comprises three major pearl fisheries in the northern waters of Bahrain, a coastline at the southern tip of Muharraq Island, and 17 buildings in the historic district of Muharraq. These buildings are connected by a 3.5-kilometer-long visitor pathway.

The project involves the construction of seventeen public squares on vacant lots, forming a pathway that connects numerous historic buildings. These squares replace disappeared structures and introduce a new type of shaded public space into the dense labyrinth of the historic city.

Design of Squares and Pathway:
The squares are densely planted with trees that grow out of circular openings in the paving, which is made of a special concrete with iridescent white nacre. These oasis-like environments are further cooled through a system of pipes, creating a protected microclimate, complete with benches and drinking water wells. A series of public squares, akin to breadcrumbs, are interconnected, guiding visitors from one location to another through polished pearl-colored concrete lampposts extending beyond the squares, illuminating the path.

Conclusion:
The revitalization plan for the preservation and development of this series of heritage sites includes not only the protection and restoration of historical buildings but also encompasses new construction projects, public space planning, and socio-economic tasks. This project falls within the public space planning aspect of the revitalization plan for this historic area. It provides a reference for how landscape design in the vicinity of heritage sites can contribute to heritage development. By repeating the placement of squares and pearl-shaped lampposts, a sense of sequence is constructed, connecting the dispersed heritage buildings within the area, thus making the touring experience more convenient and orderly. Furthermore, the design language and materials of the squares in the project are inspired by pearls, echoing the historic heritage. The trees in the squares provide shade in the hot local climate, thus providing higher-quality public spaces while expressing historic identity.

Master plan

FIG. 3.8 Master plan/downloaded from: https://www.bassmets.be/projects-selection

Public square

FIG. 3.9 Public square/downloaded from: https://www.bassmets.be/projects-selection

3.2 Theoretical background & Case study

Heritage as sector, factor and vector

Understanding heritage as a sector, factor, and vector has been derived from various practical heritage preservation planning models. It summarizes the changing roles and purposes of heritage preservation within Dutch spatial planning. This also reflects the dynamic conservation process discussed in the historic urban landscape approach.(Janssen, Joks, et al., 2017)

In the **"heritage as a sector"** approach, traditional heritage preservation methods focus on protecting disappearing historic cultural artifacts and monuments in the context of accelerated modern development. Valuable historic buildings are detached from the urban environment for preservation, emphasizing heritage as monuments. Consequently, heritage preservation primarily concentrates on restoring heritage resources like buildings.

In the **"heritage as a factor"** approach, there is a departure from solely preserving and restoring heritage monuments. With the development of international concepts such as urban restructuring and renewal, the reuse of old buildings and enhancing land use through heritage site transformation become central themes. Heritage, as a spatial factor, becomes part of regional development, contributing to the area's identity and attractiveness. Preservation planning shifts focus towards serving as a cornerstone for regional reuse and development.

In the **"heritage as a vector"** approach, heritage quality and its representation of historic identity serve as inspiration for future development, particularly in places with fewer preserved heritage entities. Historical events, stories, and environments form the heritage background, constituting its historic layers and narratives. The reuse and reinterpretation of non-built heritage elements are also part of heritage preservation and continuity, enabling the transition from a mere "collection" of monuments to a multi-layered "connection" of historic sites and landscape protection and development. (Bandarin, F. and Ron Van Oers, 2012)

I think this framework provides significant inspiration for clearly defining the direction and approach to CER heritage redevelopment in my future designs. As mentioned in earlier chapters, the current approach to railway heritage preservation primarily follows the "heritage as a sector" model, with limited exploration of the other two modes. However, it is precisely the latter two planning models that broaden the perspective, shifting from focusing solely on preserving and restoring heritage monuments to regional heritage reuse, which is more suitable for the large CER heritage collection. Moreover, they transform heritage into an inspiration for future regional development. This further expands the elements to consider in heritage preservation, including not-built, or non-physical elements, like disappearing buildings, urban fabric, and historic stories.

Paleis op de Dam

FIG. 3.10 Paleis op de Dam/downloaded from: https://upload.wikimedia.org/wikipedia/commons/3/3e/Amsterdam_Royal_Palace_7299.jpg

Image result for locomotive hall tilburg

FIG. 3.11 Image result for locomotive hall tilburg/drawn by 3D Studio PrinsPalace_7299.jpg

Glass Farm (commercial center)

FIG. 3.12 Glass Farm/downloaded from: https://architectenweb.nl/projecten/project.aspx?id=24665

FIG. 3.13 The evolution of the Dutch heritage–planning nexus/Janssen, Joks, et al.,2017

3.3 Conclusion

Looking across the theories of the Heritage Corridor, the Historic Urban Landscape Approach, and the heritage-planning models, they primarily discuss the heritage issues of what to preserve and how to preserve it. While the theoretical approaches and scales of application in the heritage system may vary, there are many commonalities in their answers to these two questions.

what to preserve
Firstly, they both emphasize the importance of the "support system" alongside heritage resources, broadly described as the environment surrounding heritage sites. At the regional scale, this includes the entire natural resource background and urban context. From the perspective of towns, it encompasses urban historic patterns, open spaces, and urban infrastructure, and so on. And from 'heritage as vector' approach even some disappeared heritage traces or intangible historic elements that can be reintepreted like historical events, traditions. There is an increasing perspective among people regarding what heritage should be preserved, evolving from a focus on tangible entities such as heritage buildings, which are typically recognized as valuable heritage assets, to an increasing emphasis on heritage environments and the readable context of heritage. To some extent, this perspective has begun to incorporate a landscape-oriented view, emphasizing the importance of historic environments in the perception and interpretation of heritage. Historic environments not only preserve historic information but also exhibit heritage identities.

how to preserve
As views on what heritage to preserve have diversified, various approaches to conservation have emerged. Drawing from changes described by heritage-planning models and cases of Heritage Corridor, and Historic Urban Landscape Approach, I categorize them into three main strategies: restore, reintegrate, and reinterpret.

The first strategy emphasizes the restoration of heritage, maximizing authenticity and integrity while often isolating it from complex urban environments. This approach emphasizes preserving monuments, especially landmarkheritage sites, with less consideration for reuse or economic viability. Along the CER route, some heritage sites are protected in this manner, enclosed by walls to shield them from urban development impacts without additional protective measures.

The second strategy advocates integrating heritage conservation into urban development as part of city planning, adapting to spatial dynamics. Historic town patterns, districts, and architecture serve as competitive cultural assets, enabling various forms of heritage development such as restoration and reinterpretation of historic fabric to enhance regional identity and quality. For example, in Hengdaohezi, efforts focus on improving street environments and preserving urban layouts. Or promoting heritage reuse, as exemplified by the case of the Datong Ancient Great Wall, where ancient villages have been transformed into scenic tourist areas. In summary, heritage resources need to complement urban development, gradually shifting from a state of isolation to one of integration.

The third strategy views heritage elements as inspiration and vehicles for spatial development, not limited to existing resources but drawing from contextual and historic landscape layers. For instance, the Pearling Pathway project establishes new squares on former building sites, utilizing materials and design forms inspired by pearls to reflect historic identity while providng rest places and road guidance for tourists. Projects in this area integrate respect for historic environments and heritage buildings into new construction and public space planning, using heritage elements as guidelines for future development.

economic value
From the latter two heritage planning strategies, there is a growing emphasis on the economic benefits of heritage. "The core challenge faced by contemporary architecture in historic urban landscapes is responding to development dynamics to promote social and economic change and growth." (UNESCO, 2009) Heritage, as a culturally competitive regional resource, supports educational, leisure, and tourism development to enhance local economies. The economic benefits derived from heritage development can be reinvested into subsequent conservation efforts, ensuring the sustainability of protection initiatives.

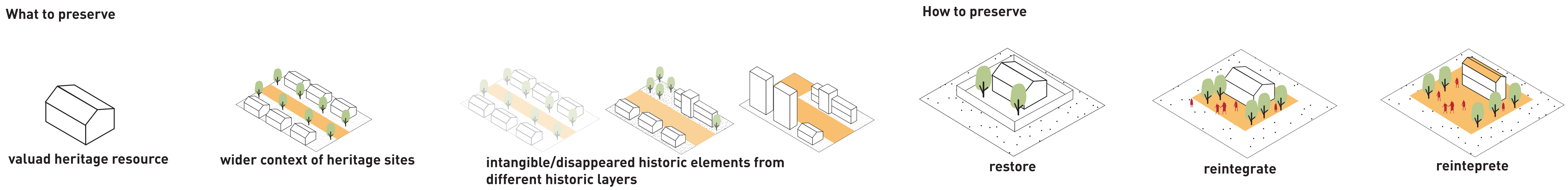


FIG. 3.14 what to preserve and how to preserve

3.3 Conclusion

How can landscape play a role in the conservation and development of architectural heritage?

I think it focuses on the preservation and development of the historic environment. The historic environment also contains historical information and provides a readable context for understanding and preserving heritage, like the Datong Great Wall corridor, protecting heritage through improving the ecological environment and reducing soil erosion. in the Pearling Pathway project, the pathway marks the old manufacturing process of the pearl industry, from breeding, collection, and step-by-step processing, corresponding to the function of the heritage buildings near the square.

And historic environment also helps to shape urban characteristics and keep the identity and quality of historic areas. The historic street structures and axes, various land use patterns, the height and volume of heritage buildings, building styles and materials, and the natural context in and around historic areas all can reflect the characteristics of townscape

And finally, the historic environment provides the foundation or the inspiration for developing a meaningful and high-quality environment. Some disappearing historic elements can be reinterpreted for new constructions, no matter the public space design or urban planning or the new buildings, they can be developed more sustainably with more historic and cultural meaning.

Thus, for the landscape design aspects, we could first comprehensively regard and protect the heritage as a whole as a regional scope including the regional landscape context and infrastructure. Also pay attention to the historic landscape patterns, like the urban fabric and structure, finally also emphasis on the spatial quality of open spaces around heritage sites

tourism development

Furthermore, from the aforementioned cases, it is evident that tourism planning plays a significant role in these preservation and revitalization plans. Among the existing development strategies, heritage tourism is currently the most successful comprehensive heritage conservation approach. By employing consistent thematic planning and roadways, tourism development can connect dispersed heritage sites within a region, facilitating their overall preservation and development. Also promoting the reuse of heritage sites, endowing them with added functional value, igniting vitality, and attracting visitors. This, in turn, provides the region with more development opportunities.

3.4 Methodological framework

The project research began with desktop research and with later on-site investigations, which led to the identification of research questions. Following a series of theoretical and case study analyses, design strategies were proposed. Finally, representative railway sections were selected for detailed design.

In the research process, the railway heritage system was divided into three different scales based on the distribution characteristics of the heritage. Subsequently, the analysis of issues, theoretical learning, and the proposal of design strategies were also accompanied by systematic analysis and reflection, forming such a hierarchical framework.

The direction of the arrows indicates that feedback occurs between different stages. For example, theoretical learning can inform the synthesis and summary of problems. Through this feedback, one can reorganize their thoughts and ultimately develop a clear organizational framework for problem-strategy design.

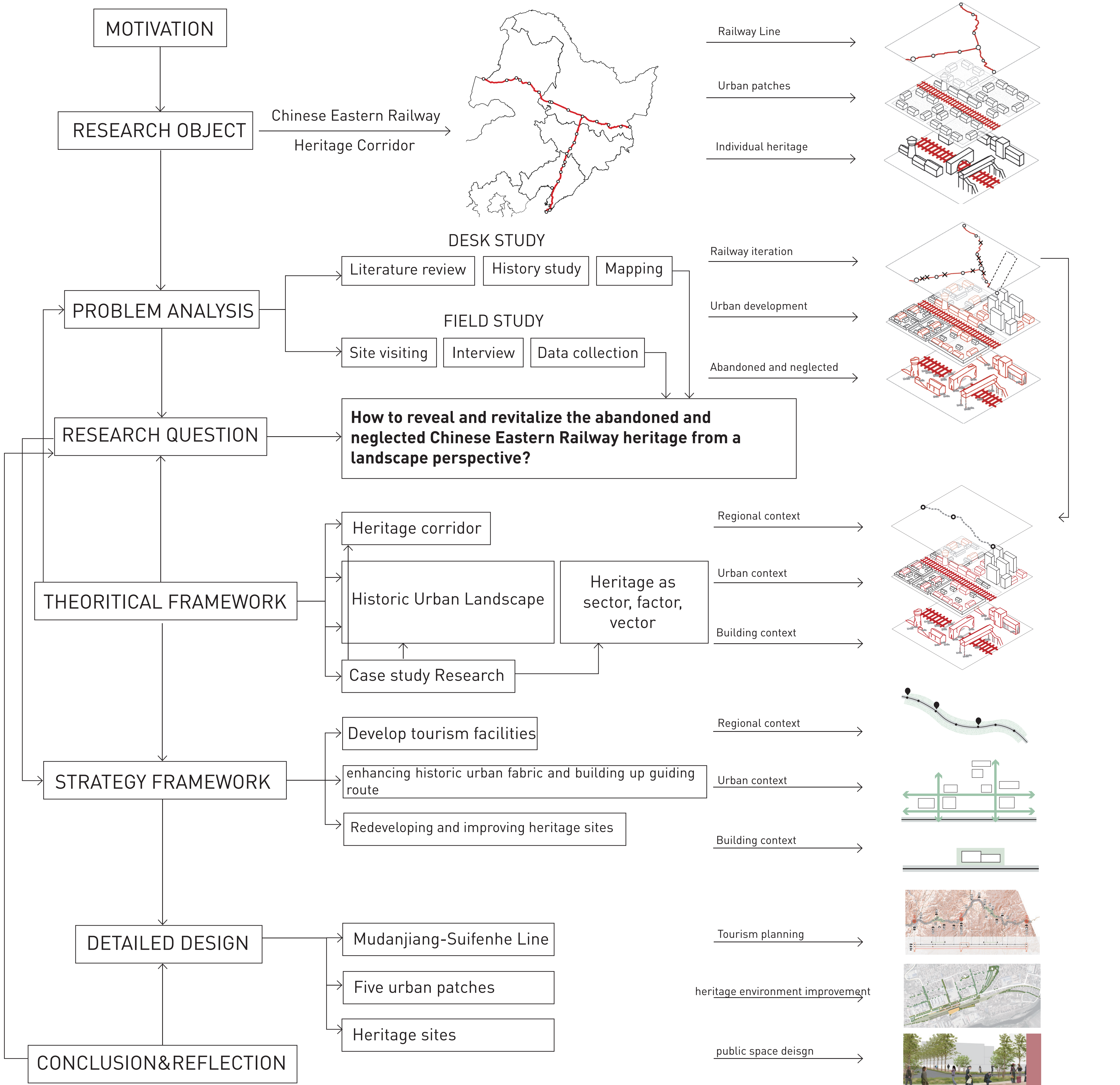


FIG. 3.14 Research and design framework/drawn by author


Residential heritage buildings in Daguanling station/Photo: taken by author

4. Intervention area

4.1 Mudanjiang-Suifenhe Line

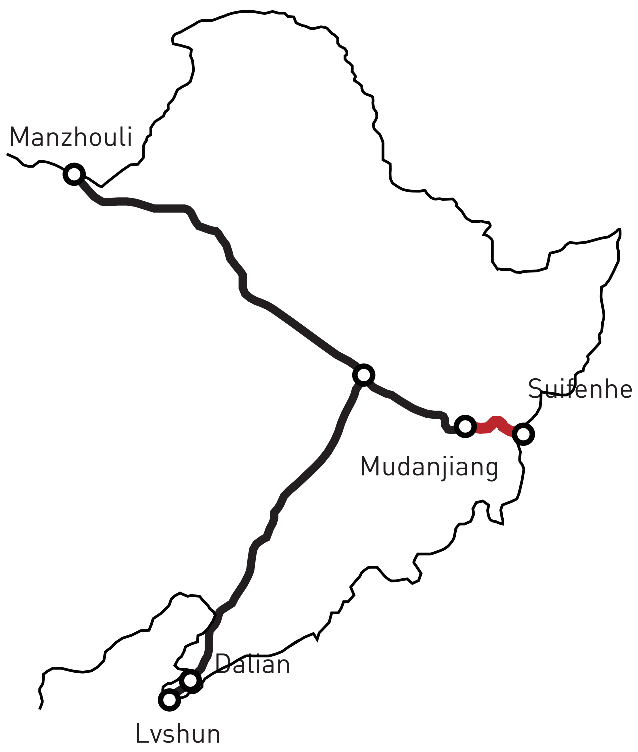


FIG. 4.1 The location of Musui line/drawn by author

The Mudanjiang-Suifenhe Line was a significant railway section during the construction and operational management period of the (CER), located at the easternmost end of the railway mainline, the terminal station Suifenhe is a border city between China and Russia. However, following the completion of the Mudanjiang-Suifenhe High-speed Railway, this old railway line was nearly entirely abandoned, making it the only large-scale discontinued railway section along the CER route. Consequently, many heritage sites fell into abandonment, but at the same time it presented an excellent opportunity as a design testing ground.

Musui high speed rail

FIG. 4.2 Musui fast train/Photo downloaded from https://matters.town/a/9ncovnvzs4i2

Abandoned station

FIG. 4.3 Abandoned railway,/Photo downloaded from https://matters.town/a/9ncovnvzs4i2

Heritage buildings

FIG. 4.4 Heritage building/Photo downloaded from https://matters.town/a/9ncovnvzs4i2

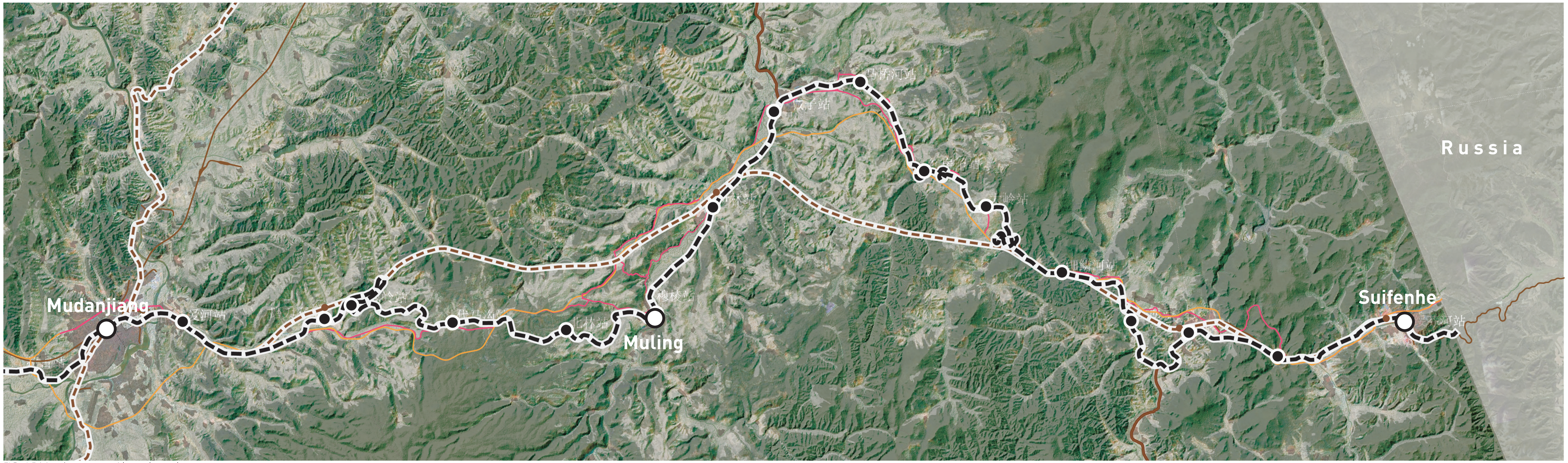


FIG. 4.5 Musui route map/drawn by author

4.1 Mudanjiang-Suifenhe Line

The region's rich natural scenery and cultural resources offer significant potential for tourism development.

The Musui Line traverses a region characterized by hilly terrain. To navigate the mountains, the railway winds through the landscape, continuously crossing two major mountains. Due to historic construction technologies and cost constraints, the railway built multiple spirals and switchbacks, much like a mountain road. As a result, the Musui Line, which covers only 200 km, includes three spirals, repeatedly twisting and climbing through the hills.

This area is also rich in natural resources, covered by vast mixed forests of conifers and broadleaf trees. The dense vegetation and diverse tree species create a spectacular autumn display. As temperatures drop and cold air moves in, the leaves change color, producing a vibrant array of greens, whites, yellows, reds, and purples, forming a unique landscape known locally as the "Five Flower Mountain." The railway's winding path through this region allows passengers to enjoy these natural vistas.

The slow pace of economic development and urbanization in this area has resulted in the preservation of most heritage sites, with minimal human interference. Unlike railway sections passing through more developed cities, the Musui Line has retained much of its original route and station layout from a century ago, maintaining a high degree of authenticity and integrity. While economic underdevelopment has led to insufficient heritage protection measures, it underscores the need to develop heritage sites to stimulate economic growth.

Autumn scenery: Five Flower Mountain

FIG. 4.5 Trains running on Musui line/Photo downloaded from https://www.toutiao.com/article/685221233012696730

Spiral loop

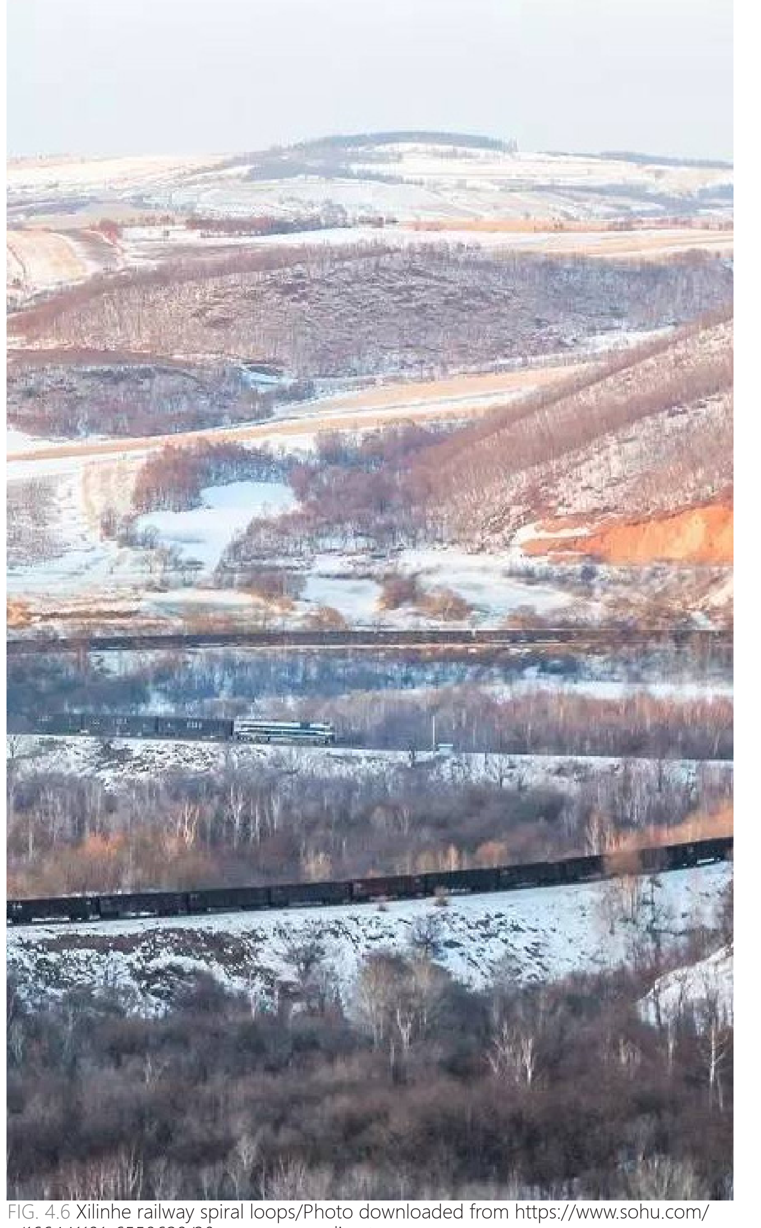


FIG. 4.6 Xilinhe railway spiral loops/Photo downloaded from https://www.sohu.com/a/166441191_6559629/?&source=m_redirect

Historic town along the railway

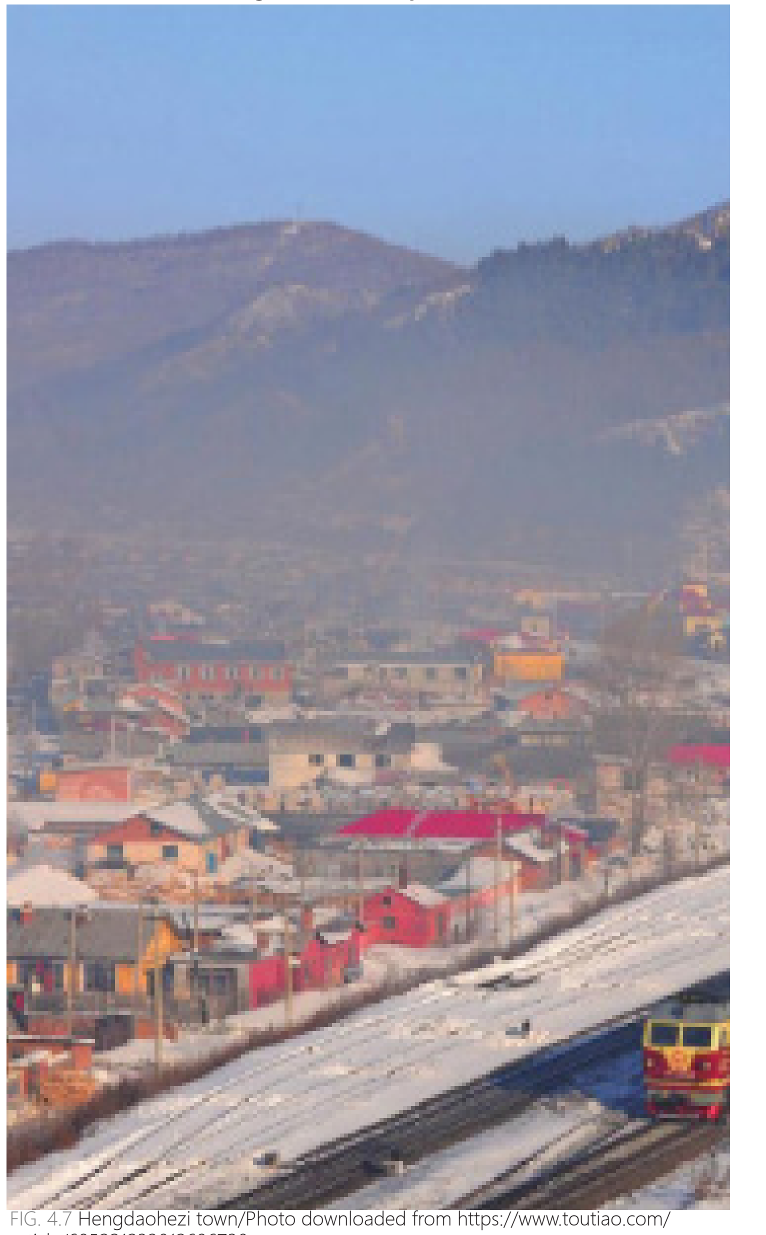


FIG. 4.7 Hengdaohezi town/Photo downloaded from https://www.toutiao.com/article/685221233012696730

4.2 Historic urban patches

As mentioned in the introduction, the Russians built railway stations along the line, including associated work and living areas. They categorized the planned stations into five grades and constructed them according to this hierarchical system. Each grade had different construction requirements and standards; for instance, a second-grade station required more residential housing, hospitals, office buildings, and other service facilities. The construction of several passing stations later followed a similar pattern.

This approach resulted in the formation of variously sized architectural clusters. Some clusters took on the semblance of small towns with standardized planning blueprints, while others comprised only a few buildings forming small work areas.

Today, these historically constructed areas have now become heritage patches. Based on the size and layout of these heritage patches, they can be classified into two categories. The first category comprises Class I, II, and III stations, which, due to their higher rank and larger scale, formed the prototypes of today's historical urban areas and towns. The grid of intersecting rectangular streets and other urban structures has endured to the present day. On the other hand, the second category includes Class IV, V stations, and passing stations, which being smaller in scale, left clusters of heritage buildings along the railway line. The heritage patches along the Mudan-Suifenhe Railway can also be classified in this manner, consisting of two Type I patches and fifteen Type II patches.

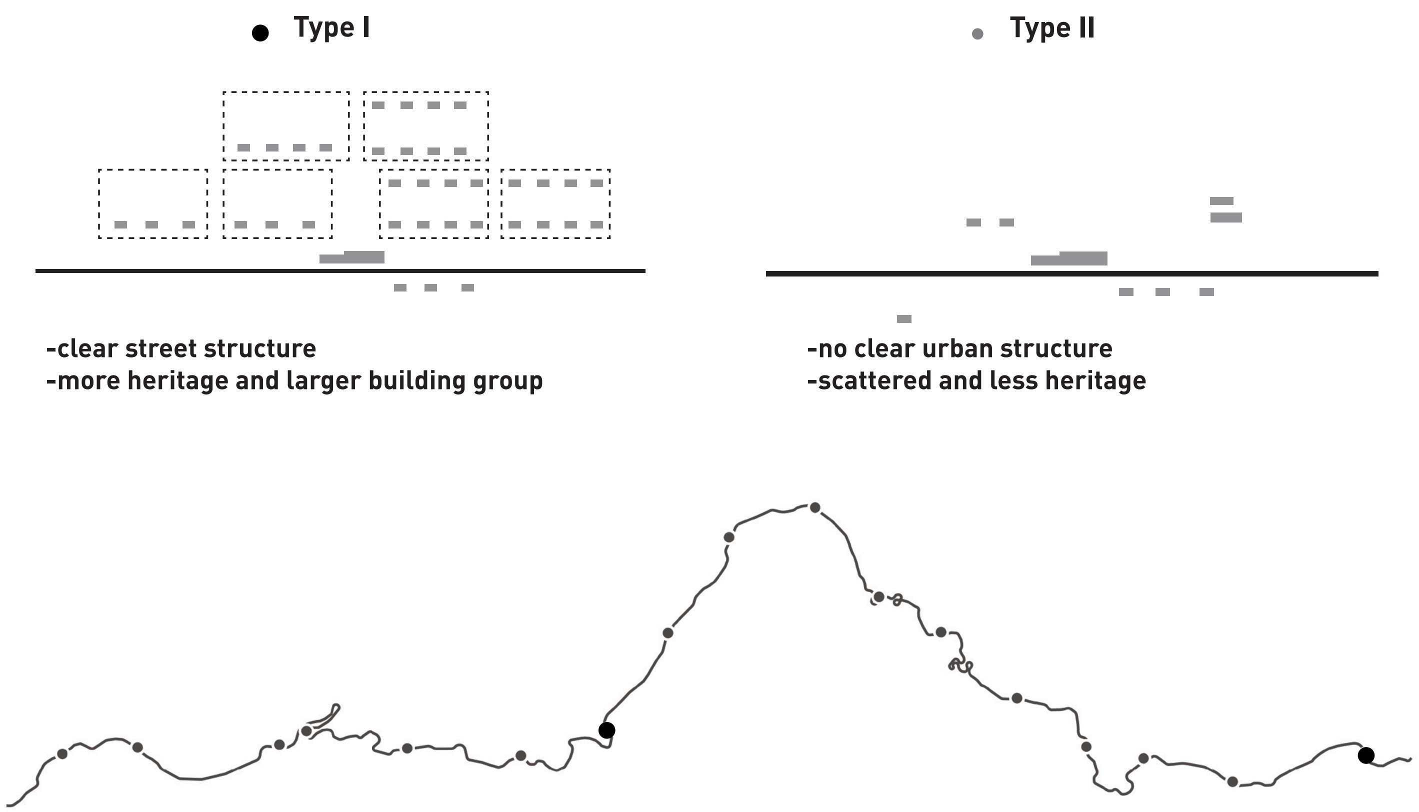


FIG. 4.8 Two types of historic urban patches/drawn by author

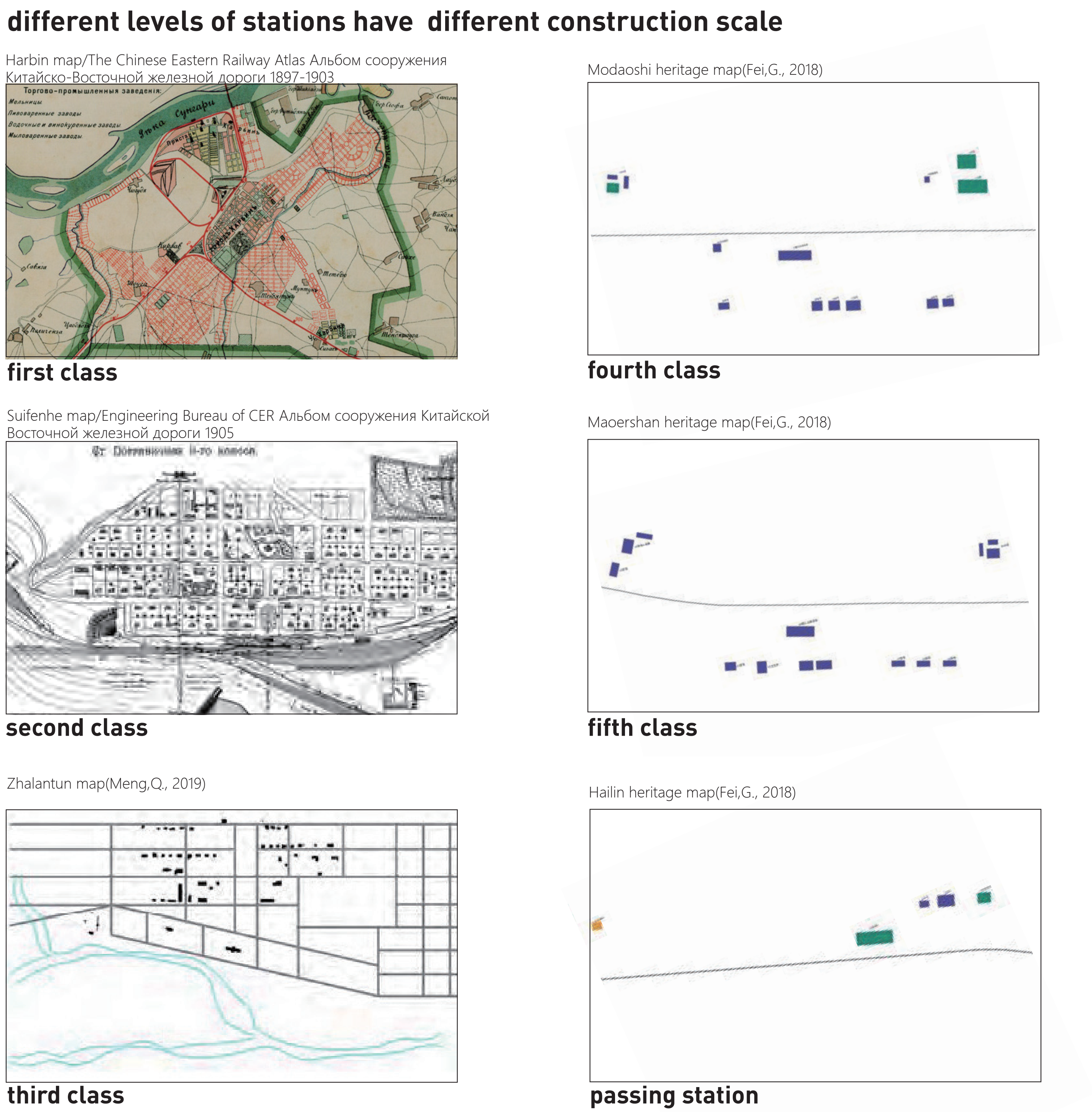


FIG. 4.9 Current heritage map of six types of stations

4.3 Historic urban landscape pattern

I employed the theory of Historical Urban Landscape (HUL) to interpret the historic townscape pattern of the heritage patches along the Musui Railway line, focusing on three aspects: **natural and geographical environment, urban fabric and spatial organization, as well as green open spaces.** (Bandarin, F. and Ron Van Oers, 2012)This interpretation aims to provide insights into the village layout along the railway line a century ago, serving as a reference for future landscape interventions. The typology diagram on the right was made based on historical images and standardized drawings from the railway construction period. To encompass more content, the town layout leans towards Type I patches, as Type II townscapes actully shares similar patterns but with fewer heritage buildings.

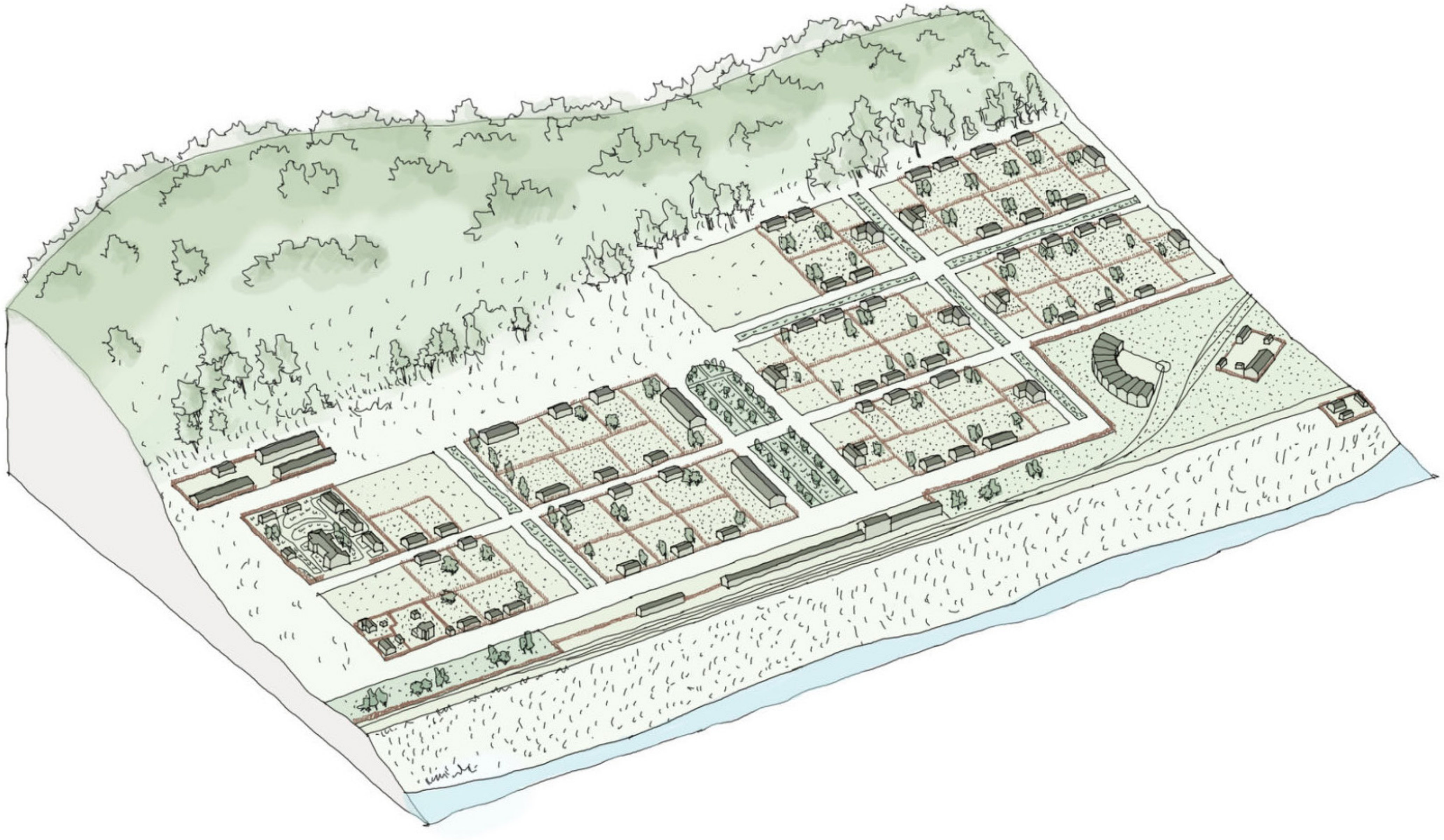
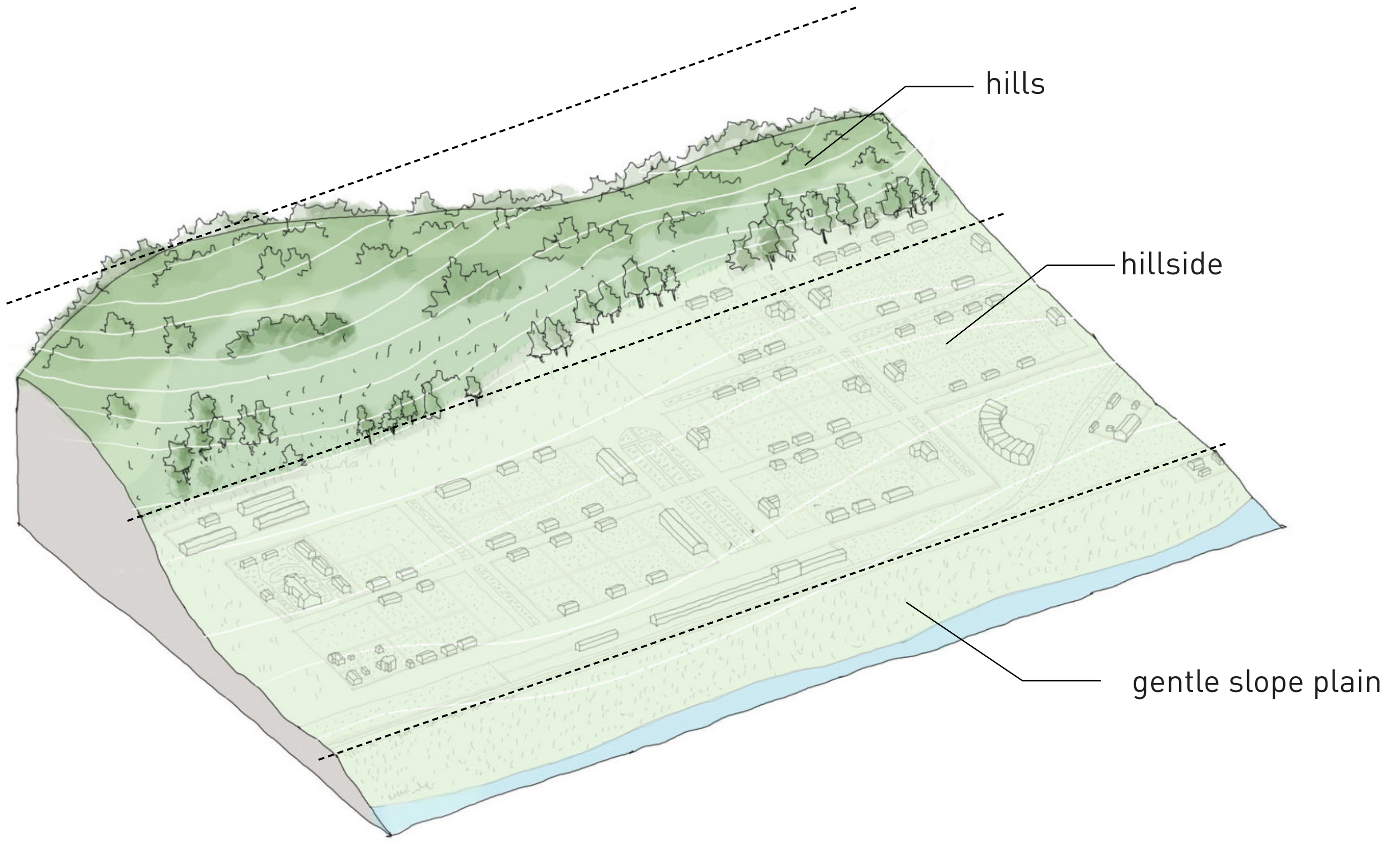


FIG. 4.10 Typology of one railway town along Musui line/drawn by author

4.3 Historic urban landscape pattern

natural and geographical environment

As described before, the railway section from Mudanjiang to Suifenhe is situated amidst the ridges of the Mountains. As a result, towns are typically established at the foothills or on the slopes of hills. The area boasts picturesque hilly landscapes, surrounded by undulating hills and winding streams. Additionally, due to the hilly terrain, towns commonly feature spatial and visual axes from up to bottom, constituting a significant characteristic of the historical towns along the Mudanjiang-Suifenhe railway line.



Hilly landscape

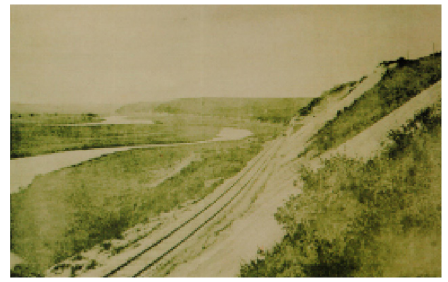


FIG. 4.12 Railway scenery/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

Spatial and visual axis

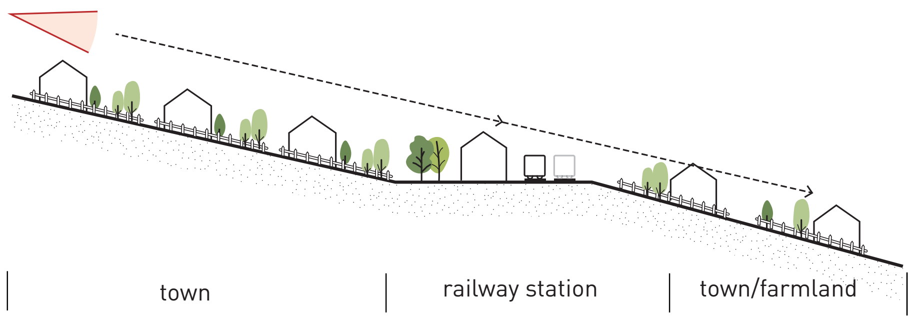


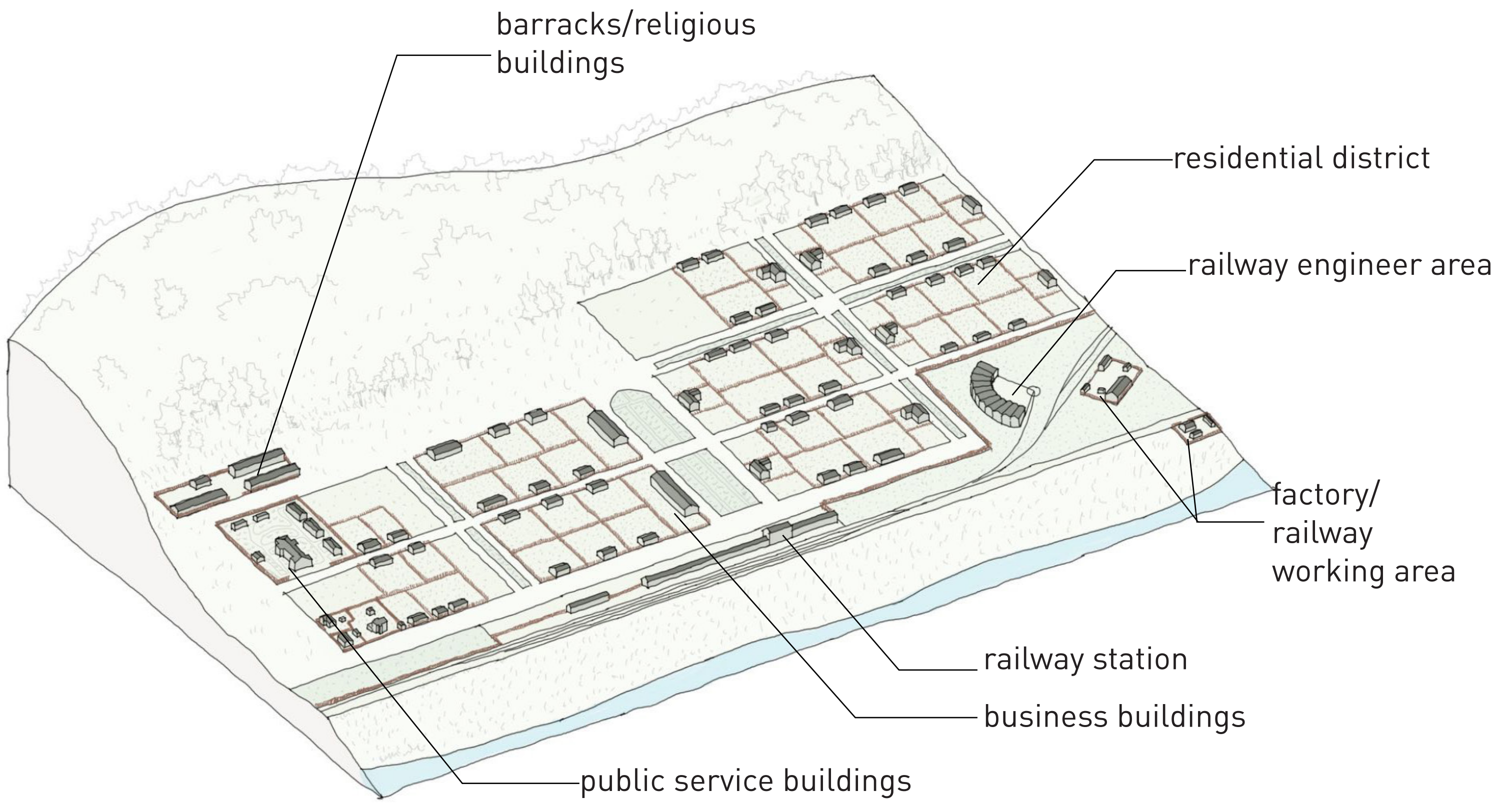
FIG. 4.11 Characteristics of natural and geographical environment /drawn by author

FIG. 4.13 Hillside town/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

4.3 Historic urban landscape pattern

urban fabric and spatial organization

The urban structure is relatively simple, characterized by a gridiron street layout for expedited construction. Typically, the streets run parallel to the railway line, with a central axis emanating from the train station, creating a symmetrical arrangement on either side. The areas adjacent to the railway line primarily consist of engineering facilities, with factories possibly situated at the terminus or nearby. Along the main street in front of the train station, there are usually public and commercial buildings, while the majority of the area comprises residential zones. Some public service buildings may be interspersed within the residential areas, while specialized structures such as barracks and churches are typically located slightly away from the main urban zone. The building blocks are also straightforward, consisting of individual houses paired with large courtyards, with a typical floor area ratio of 1:10, repeating in a consistent pattern throughout the area.



Land use pattern

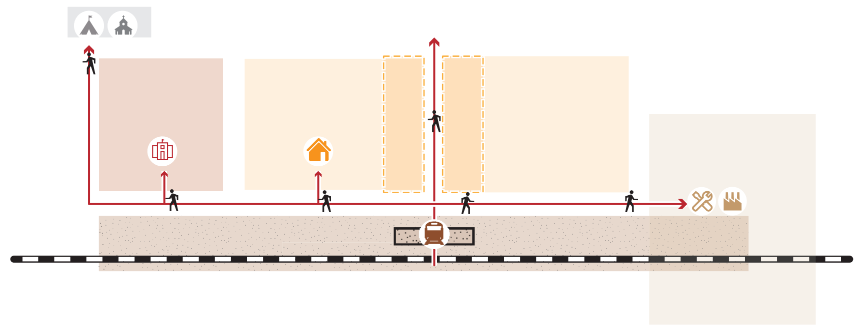


FIG. 4.15 Railway town/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

street structure

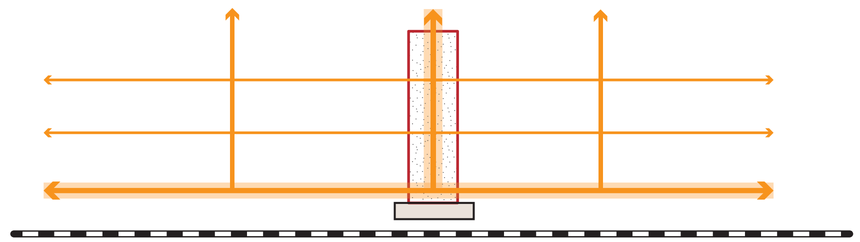


FIG. 4.16 Town axis/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

building block

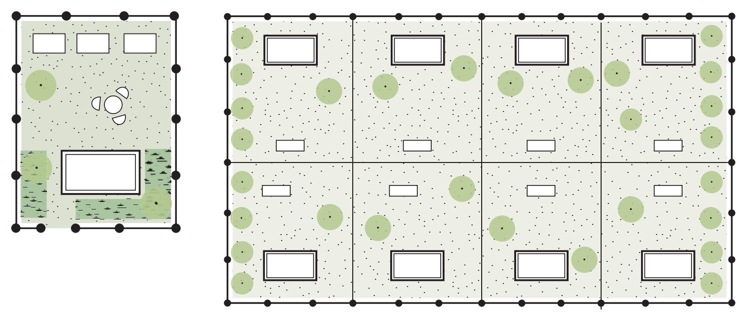


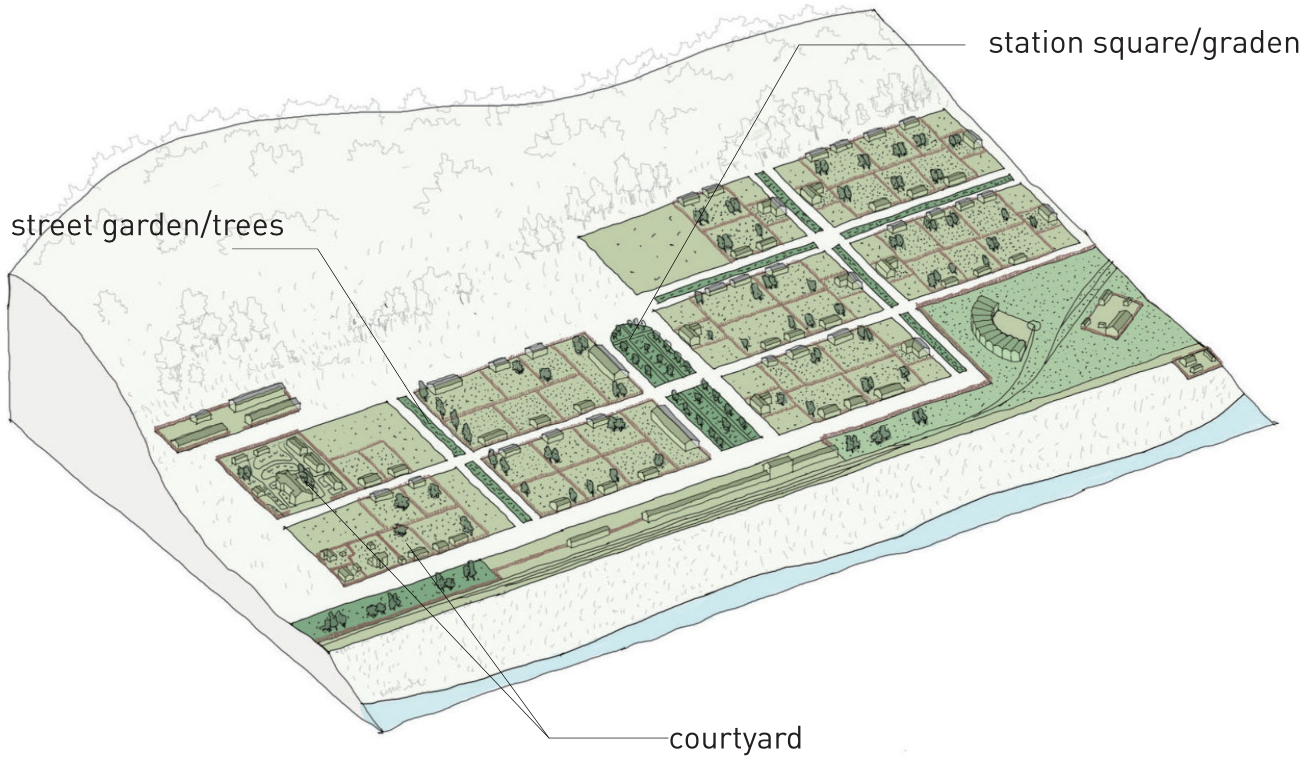
FIG. 4.17 Building block/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

FIG. 4.14 Characteristics of urban fabric and spatial organization /drawn by author

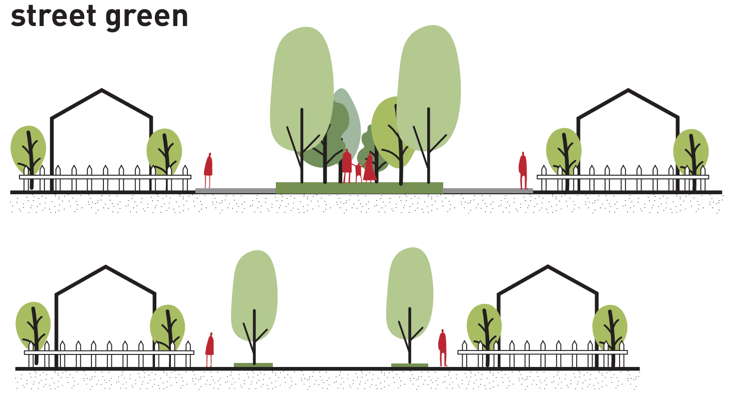
4.3 Historic urban landscape pattern

green open space

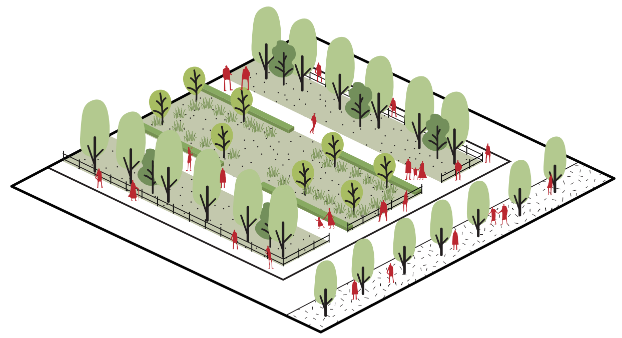
The construction philosophy at the time was heavily influenced by the concept of garden cities, characterized by ample green spaces within urban areas. The towns featured extensive green spaces, with central gardens along main streets, and trees lining residential streets. Large green areas were present along the central axis in front of train stations. Both public buildings and private residences boasted sizable courtyards, contributing to the overall abundance of greenery in the urban landscape.



street green



station square



Courtyard

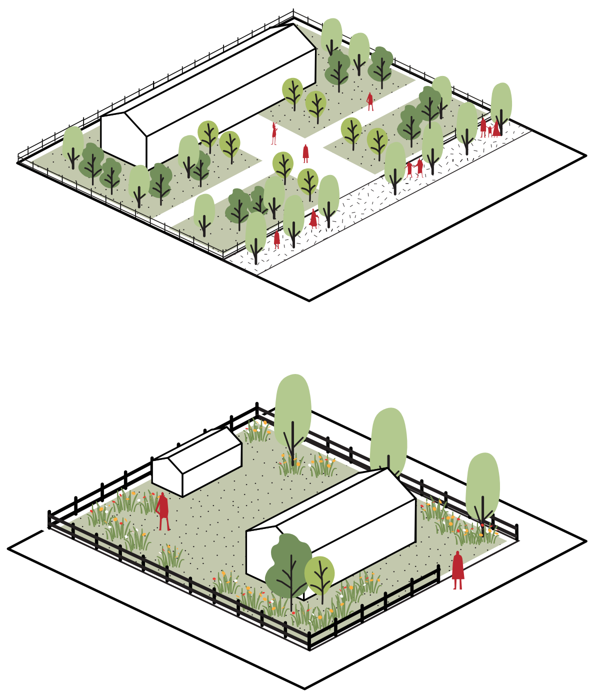


FIG. 4.18 Characteristics of green open space/drawn by author

FIG. 4.19 Street garden/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

FIG. 4.20 Harbin station square/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

FIG. 4.21 Public buildings/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

FIG. 4.22 Residential buildings/The Chinese Eastern Railway Atlas Альбом сооружения Китайско-Восточной железной дороги 1897-1903

Railway on Modaoshi station/Photo: taken by author

5. Design exploration

5.1 Design strategy

Following the layered framework of problem analysis and theoretical study, the design strategy phase also starts from an overall framework, proposing heritage conservation and development strategies at different scales.

As discussed in the theoretical chapter, heritage tourism is currently the most successful comprehensive heritage conservation method. The abundant natural and cultural resources along the Musui Railway also provide a solid foundation for tourism development. For the scattered heritage sites along the Musui Railway, railway tourism can unify them into an integrated whole through the railway/road network. Developing tourism also provides an initial direction for the renovation and development of numerous heritage buildings, such as launching tourist trains, reopening train stations, and converting heritage buildings into tourist centers.

From the town and building scale, heritage planning can be integrated with local spatial development, with heritage tourism as a development orientation. This requires the conservation and restoration of historic townscapes to reflect local historic and cultural characteristics, emphasizing the spatial patterns, textures, and public spaces planning in historic areas. Additionally, it involves promoting the adaptive reuse of heritage buildings to improve tourism services to provide visitors with accommodation, sightseeing, and recreational functions.

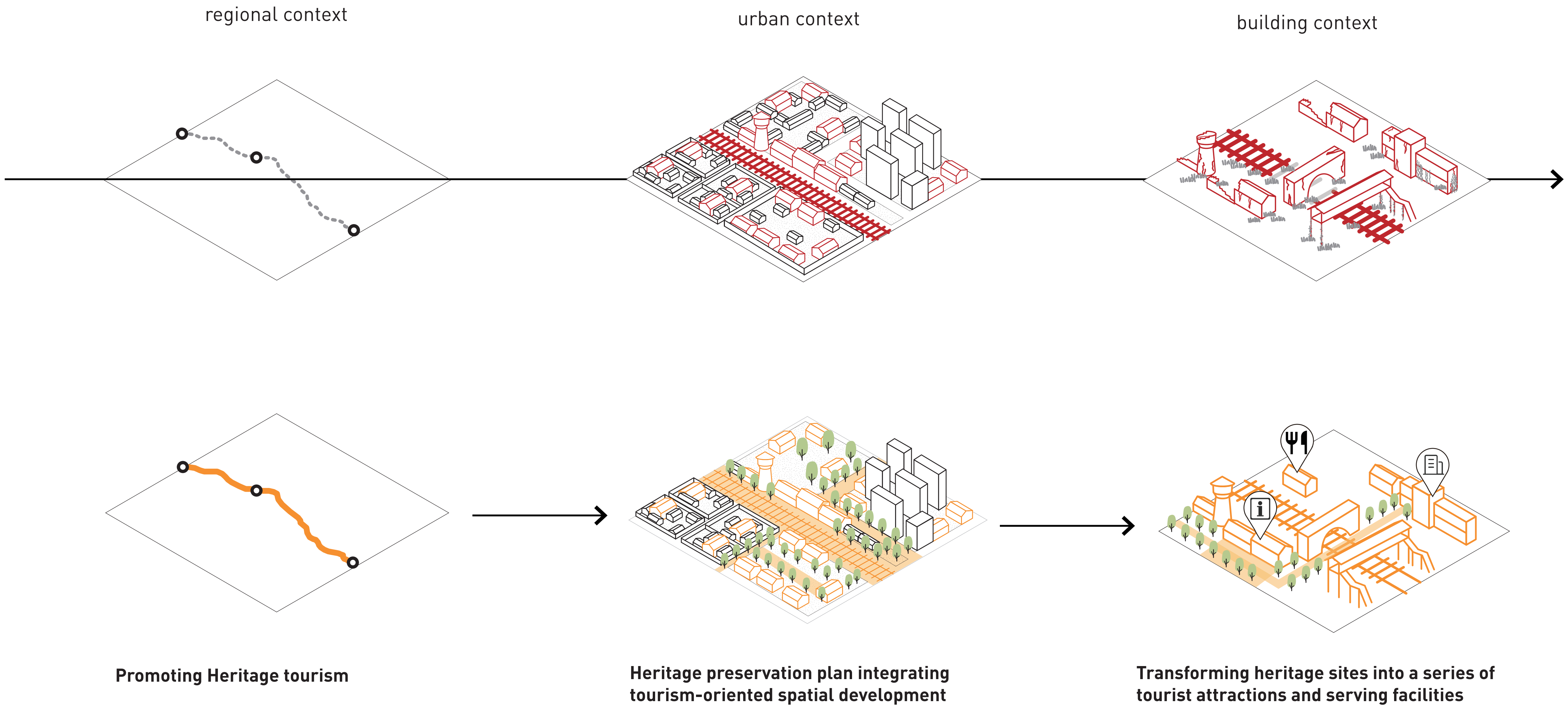


FIG. 5.1 Design strategy/drawn by author

5.2 Design process

Point-axis development model

The point-axis theory was proposed by Lu Dadao in 1984 as an extension of the growth pole theory. The growth pole theory, first introduced by French economist F. Perroux in 1950, explains that economic growth in a country or region occurs in an unbalanced manner. A city or leading industry with superior conditions and significant development potential acts as a growth pole, expanding first. Once it reaches a critical mass, its influence radiates to surrounding towns, eventually promoting comprehensive regional development.(Yuelun,T.,2018)

Building on this, the point-axis theory suggests that transportation routes with relative development potential can serve as key development axes within a region. Cities along these axes with favorable conditions can be developed as core nodes. Over time, these nodes generate scale effects that progressively diffuse, impacting secondary axes and nodes, which then become new focal points for development. The point-axis model thus describes a process of development gradually shifting from more developed areas along transportation routes to less developed ones.(Yuelun,T.,2018)

The Musui Railway line traverses an area with few developed cities, poor economic conditions, limited overall tourism infrastructure, uneven town development, and a wide distribution of heritage sites. Therefore, tourism development along the line needs to be gradual. The point-axis development model can be applied by prioritizing areas with better economic foundations, transportation facilities, and richer cultural resources. Initial investments and tourist inflows into these key areas will eventually influence surrounding towns, leading to broader regional development through diffusion effects.

This section does not provide a specific evaluation of towns to be developed at different levels but qualitatively summarizes the economic development levels and the natural and cultural resources of towns along the railway. The primary aim is to outline the development process.

foundations, transportation facilities, and richer cultural resources. Initial investments and tourist inflows into these key areas will eventually influence surrounding towns, leading to broader regional development through diffusion effects.

This section does not provide a specific evaluation of towns to be developed at different levels but but accroding to the economic development levels and the natural and cultural resources of towns along the railway. The primary aim is to outline the development process.

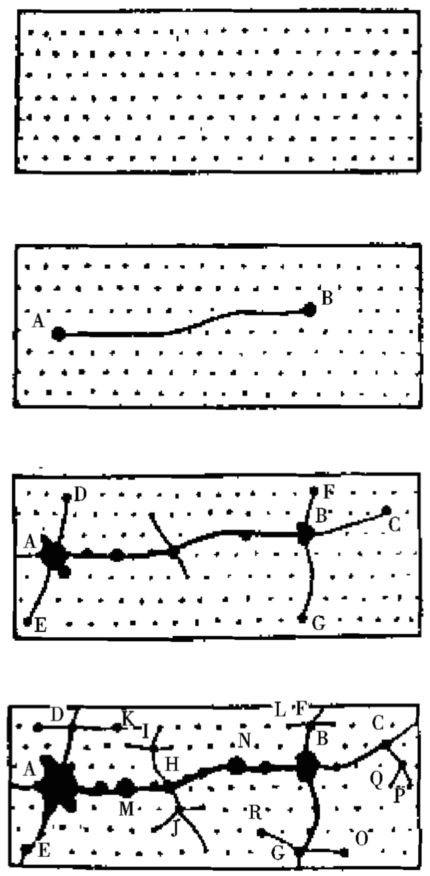
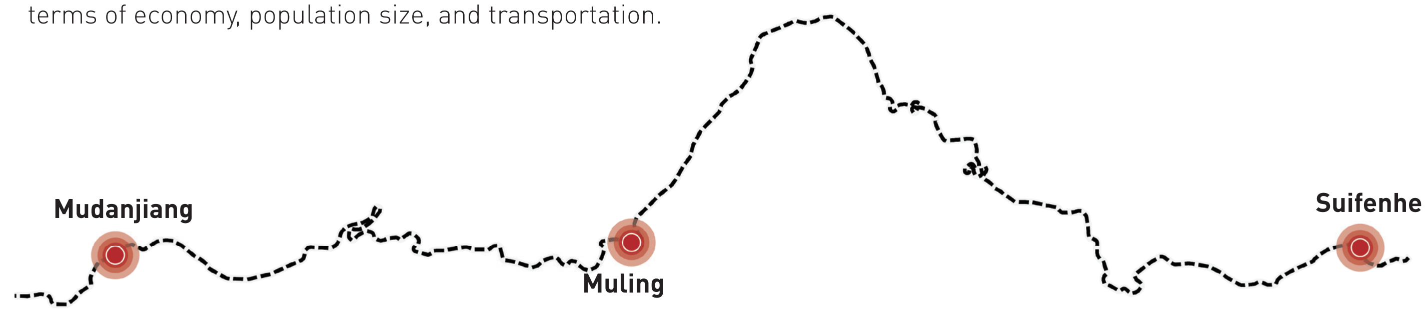


FIG. 5.2 Point-axis model/downloaded from: https://www.guayunfan.com/baike/903370.html

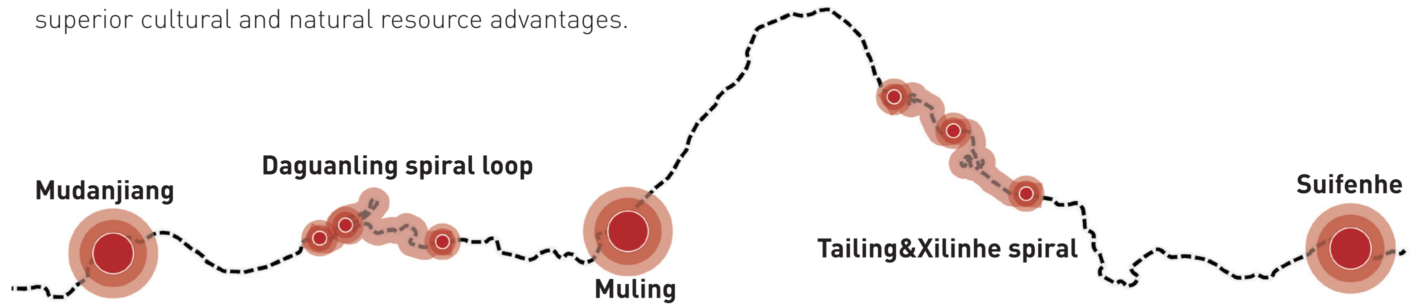
Phase1

Prioritize the development of Mudanjiang, Muling, and Suifenhe, the three towns and cities that have relative advantages in terms of economy, population size, and transportation.



Phase2

Secondly, jointly develop the towns along the railway spiral loops, which wind through mountainous regions and possess superior cultural and natural resource advantages.



Phase3

The prioritized development of these towns will generate a scale effect, attracting more visitors and eventually incorporating the heritage of smaller stations into tourism development.

FIG. 5.3 Musui line tourism development process/drawn by author

5.2 Design process

Applying the point-axis theory to the development of towns follows the same principle. The first phase begins with the railway and station areas, followed by the development of more interesting heritage sites in the nearby communities. This approach reconnects scattered heritage sites with green spaces or green streets. All these interventions will improve the perception and experience of visiting heritage sites, thereby enhancing their appeal to tourists. Once the interventions reveal the presence and value of the railway heritage, more stakeholders, such as private owners and developers, will be encouraged to participate in this re-planning process, further promoting the revitalization of the town's heritage.

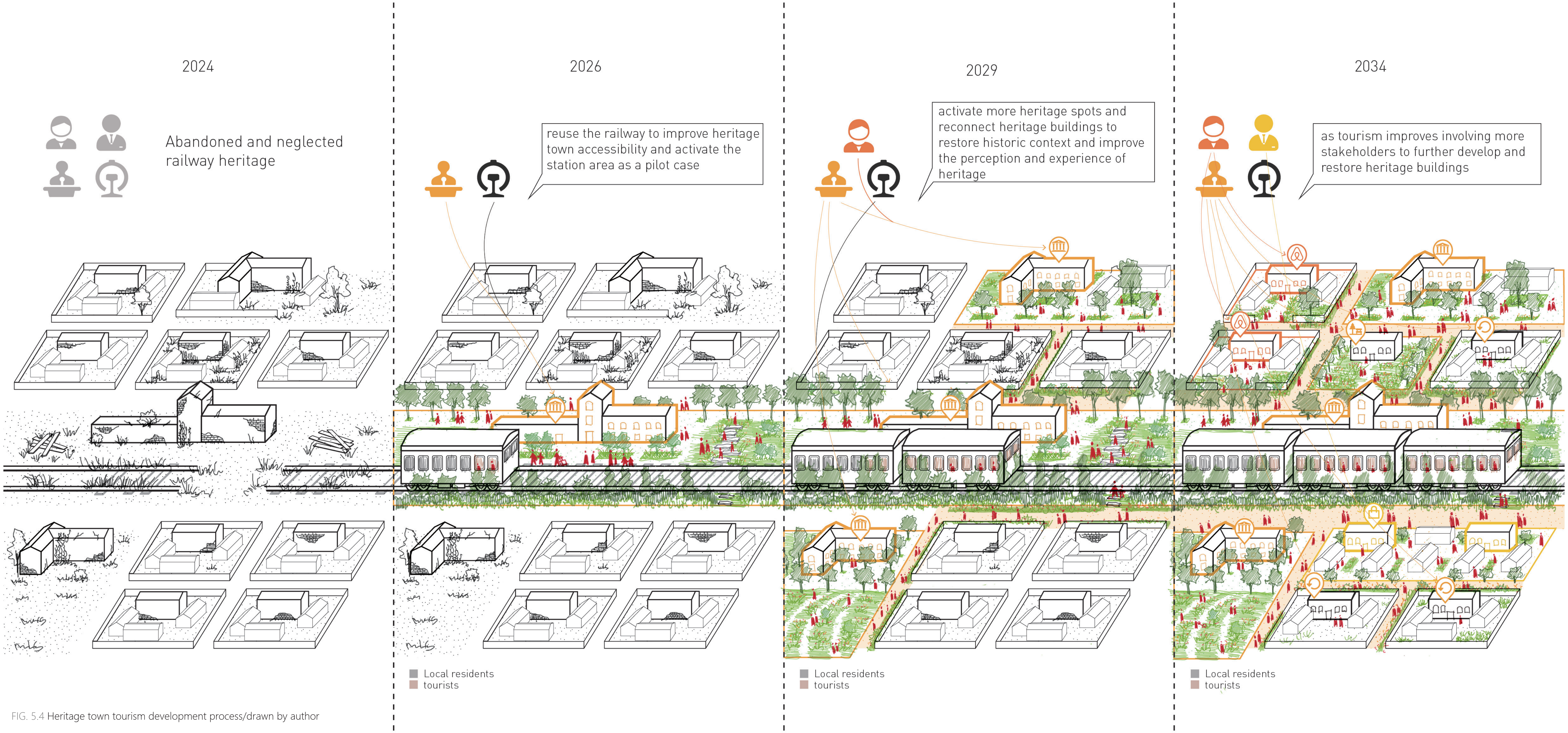
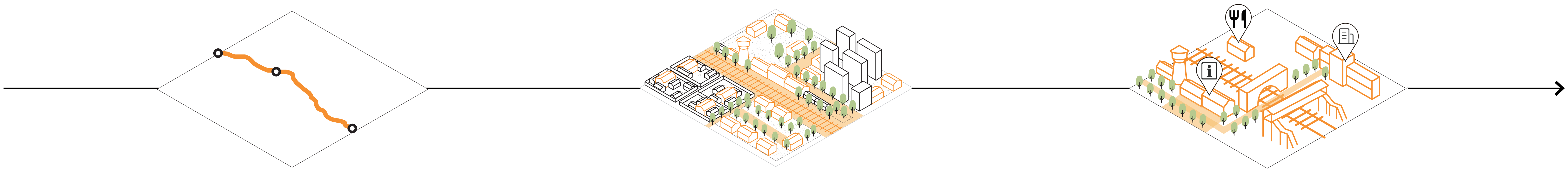


FIG. 5.4 Heritage town tourism development process/drawn by author

5.3 Design interventions

Based on earlier design strategies, specific design interventions from landscape perspectives are proposed from three scales:



regional context

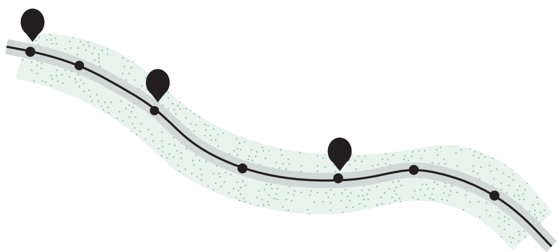
Promoting Heritage tourism

urban context

Heritage preservation plan integrating tourism-oriented spatial development

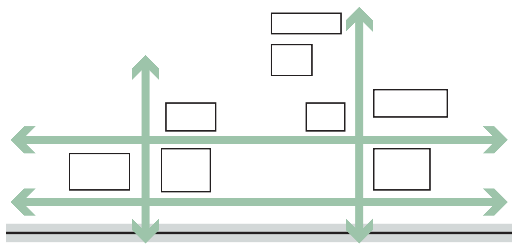
building context

Transforming heritage sites into a series of tourist attractions and serving facilities



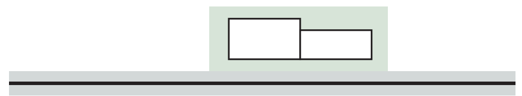
Developing heritage touristic facilities

For the Musui line, the primary focus for developing tourism is to enhance the accessibility of heritage sites, especially since more than half of the towns are located in mountainous areas. The next priorities include tourism infrastructure, basic amenities such as attractions, and accommodations, as well as the design of tourist routes, roads, signage, and essential facilities for rest.



enhancing historic urban fabric and building up guiding route

At the urban scale, the focus primarily targets the non-built environment. Firstly, emphasis can be placed on reinterpreting historic patterns such as axes and roads, as well as the disappeared heritage, such as demolished buildings and railway lines, can be undertaken. Considering that heritage buildings are often dispersed throughout towns, guiding tourists through continuous public spaces and road connections can be effective. The main idea is to improve the aesthetic and functional quality of existing heritage environments making it easier for people to notice and appreciate the heritage.



Redeveloping and improving the heritage site

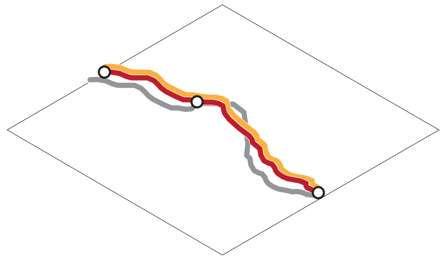
At the building scale, based on the town-scale strategies and the spatial identity different types of buildings play in the historic urban context, the project proposes the adaptive reuse and development of heritage buildings and the improvement of surrounding green open spaces from the perspective of tourism development.

FIG. 5.5 Design strategy and design interventions/drawn by author

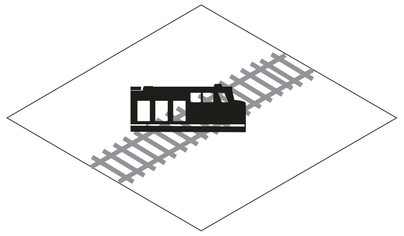
5.3 Design interventions

Developing heritage touristic facilities

1.Multiple transportation and guided routes planning

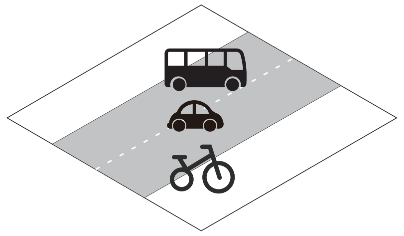


Railway



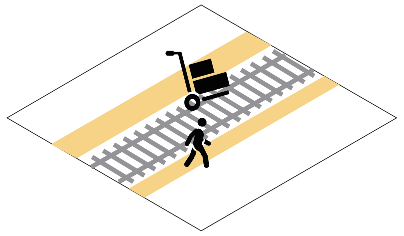
set tourism train by using old railway

Road



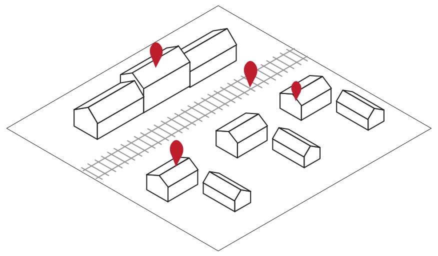
improve more connections with national roads

Hiking trail

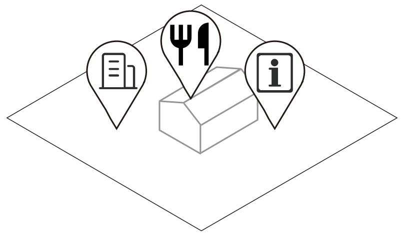


transform some railway into hiking route

2.Creating heritage attractions and service facilities

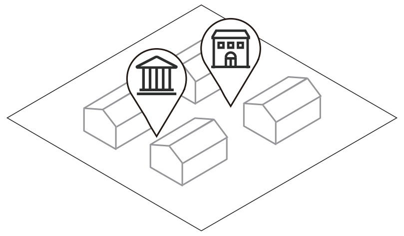


Service facilities



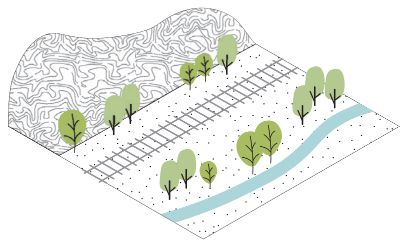
hotel, tourism center, restaurant

Tourism attractions



museum, heritage buildings, districts

Tourism attractions

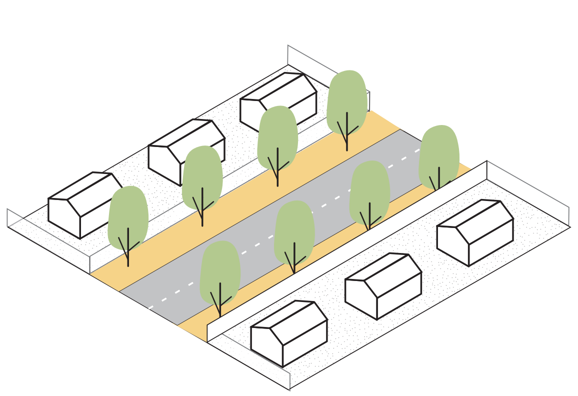


railway structures within landscape

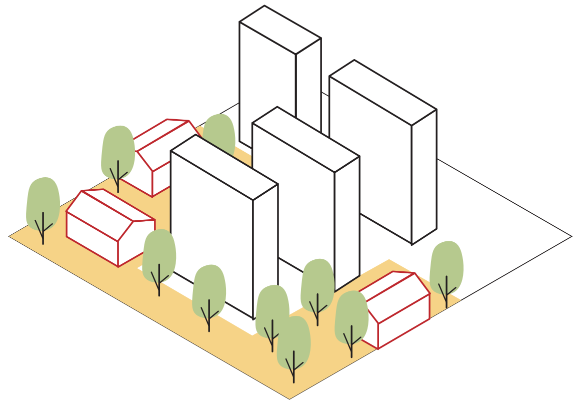
FIG. 5.6 Design interventions/drawn by author

Enhancing historic urban fabric and building up guiding route

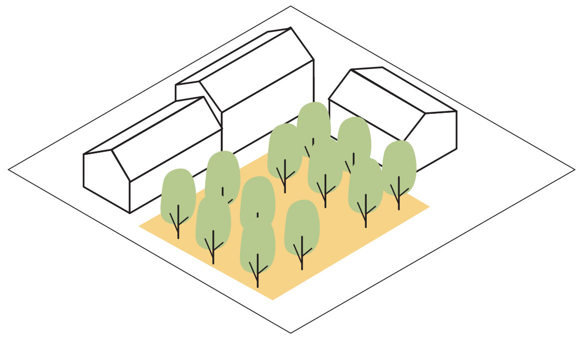
1.open up green pedestrian area to interprete historical context



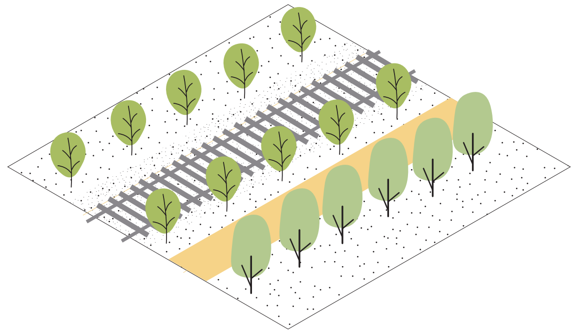
2.Adding green plots/public space to enhance heritage connection



3.Reinterpreting/restoring historic green open space



4.Transform historic railway line into green connection

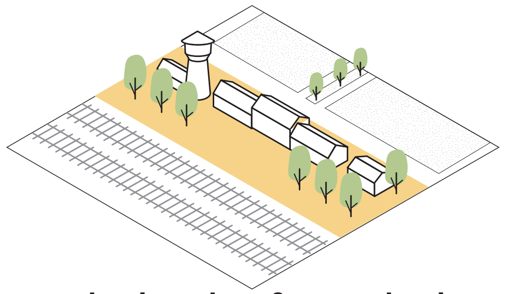


5.3 Design interventions

Redeveloping and improving the heritage site

1.historic center: station buildings

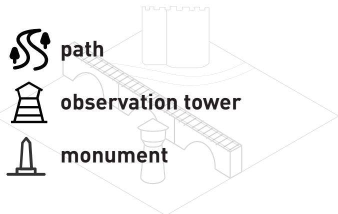
Yimianpo station, downloaded from https://forum.vgd.ru/614/62512/160.htm?a=stdforum_view&o=

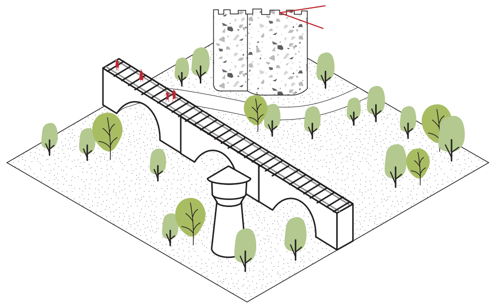


gathering place&central axis

2.Landmark: infrastructure(bridge, railway, tunel, fortification, water tower...)

Bridge pier, downloaded from: https://www.sohu.com/a/457878809_121005440

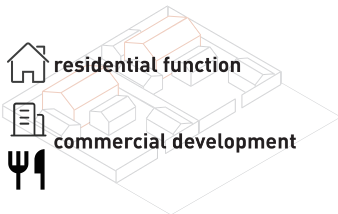


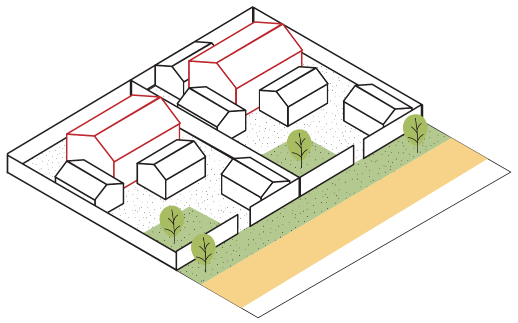


landscape structures

3.Heritage matrix:residential house group

Heritage residential building, downloaded from: https://www.163.com/dy/article/ELU3SJ4M052198BL.html

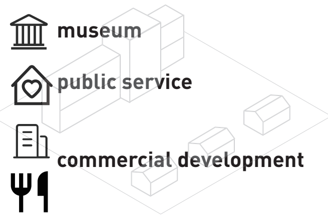


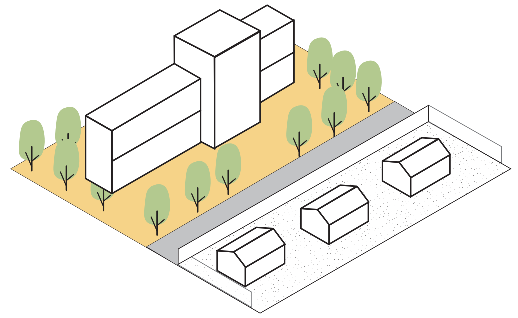


private coutryard
front door garden

4.scattered spots: other public service buildings(office, industry, pump house

Heritage club building, downloaded from: https://weibo.com/5906151643/NpwPFalEG

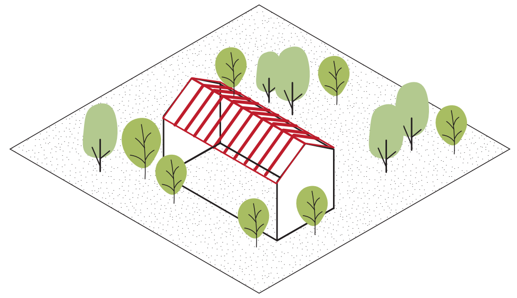




public space around site

5.desolate atmosphere: remains

Abandoned heritage buildings, downloaded from: http://bbs.hasea.com/thread-459152-1-1.html



landscape structures

FIG. 5.7 Design interventions/drawn by author


Heritage building on Daguanling station/Photo: taken by author

6. Design implementation

6.1 Regional scale

6.1.1 Route plan&tourist attractions

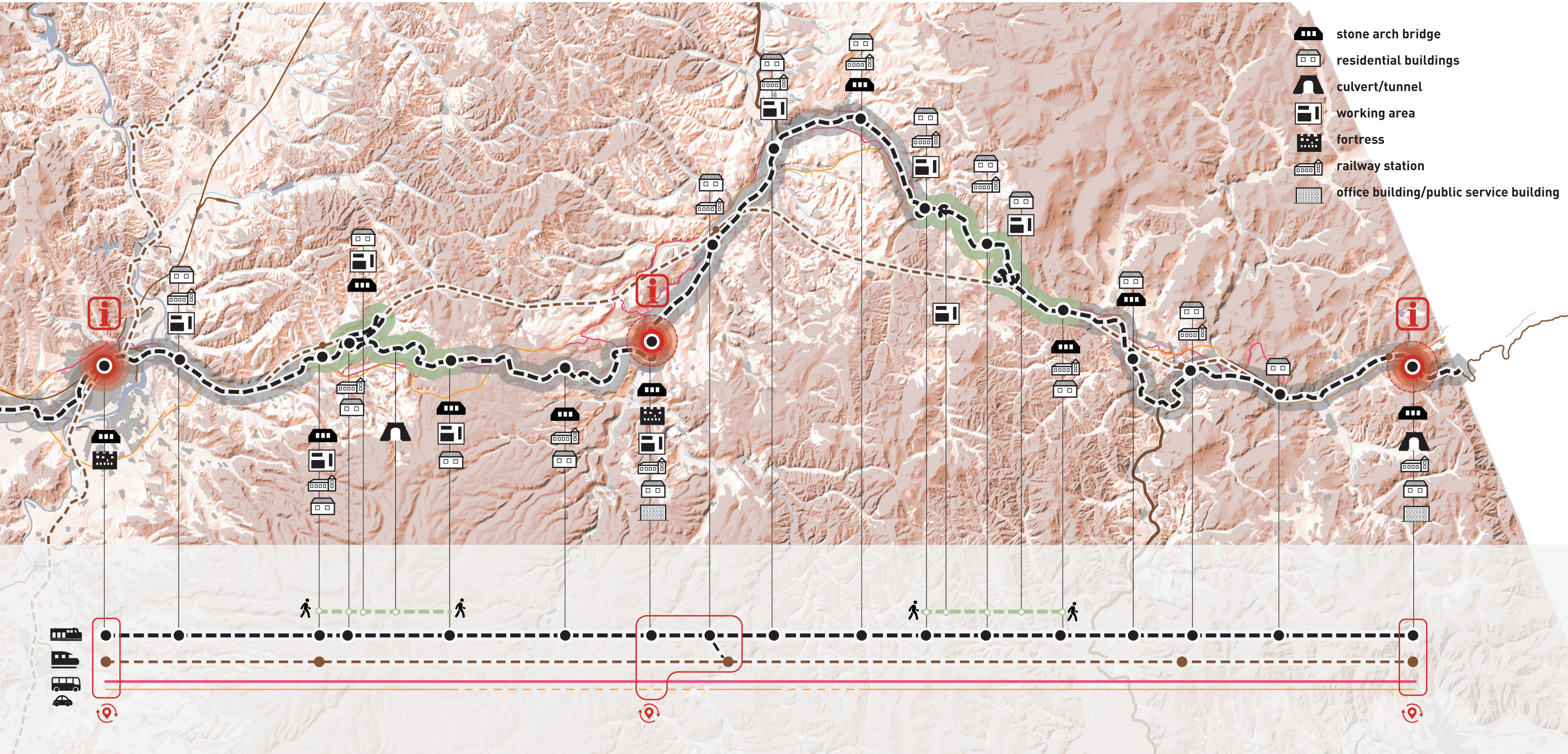


FIG. 6.1 Route plan&tourist attractions/drawn by author

6.2 Urban scale&Building scale

6.2.1 Selection of testing sites

As mentioned earlier, historic urban patches along the route primarily fall into two categories. These historic patches are situated within different urban contexts, exhibiting distinct spatial identities. For instance, scattered heritage buildings within cities do not form building clusters but rather resemble dot-like public spaces. In contrast, in villages, due to their smaller scale, heritage sites can maintain certain connections and form small clusters. Therefore, by combining historic patch types with urban contexts along the route, five categories of patches have been identified and summarized.

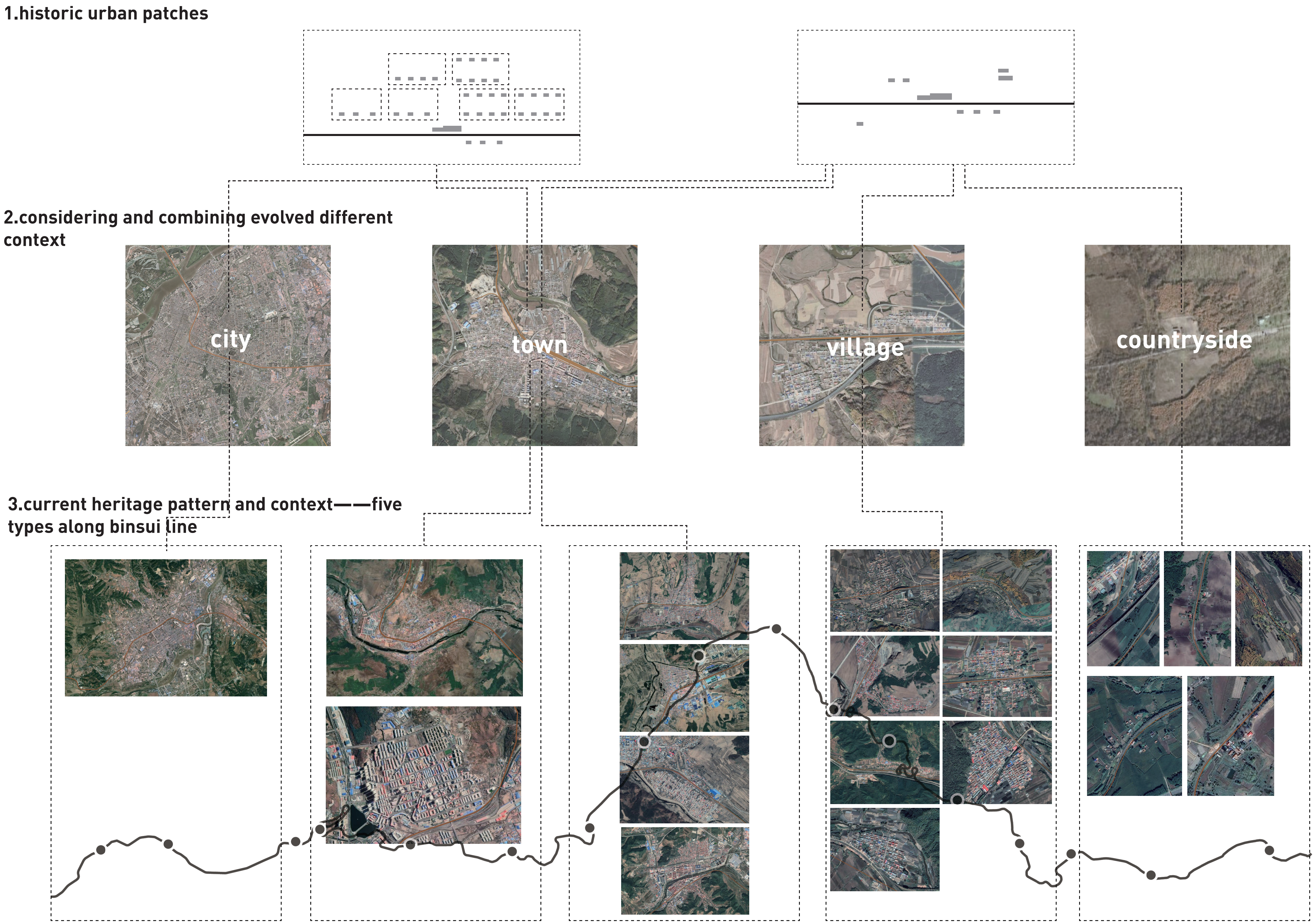


FIG. 6.2 Categorizations of urban patches along Musui line/drawn by author

6.2 Urban scale&Building scale

6.2.1 Selection of Design sites

One patch was selected from each of the five urban patches for subsequent design purposes: Mudanjiang, Modaoshi, Muling, Daimagou, Daguanling sprial loop(Shandi-Daguanling-Shandong)

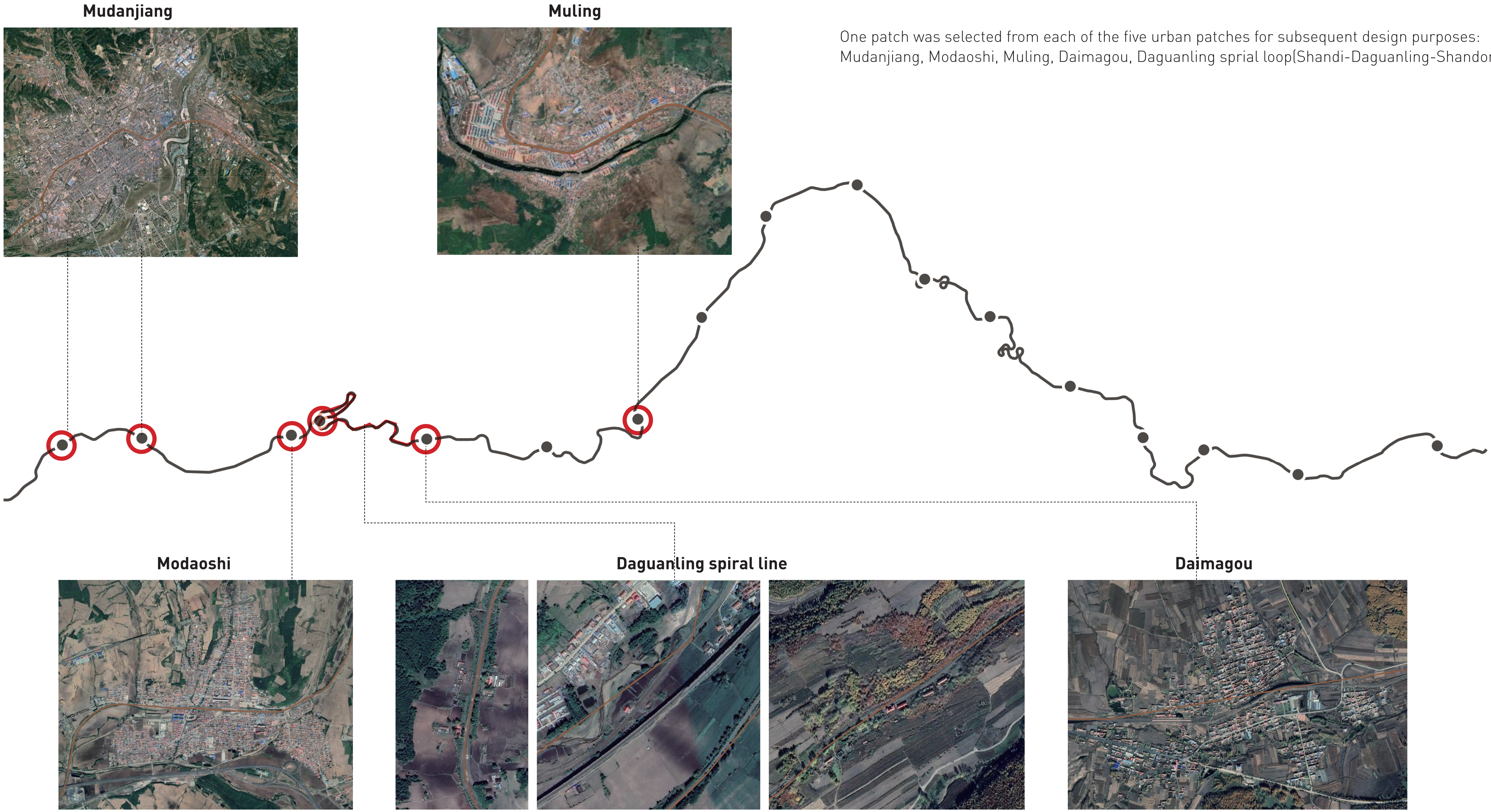


FIG. 6.3 Seclection of urban patches along Musui line/drawn by author(base map: Google Earth)

6.2.2 Design site1: Mudanjiang

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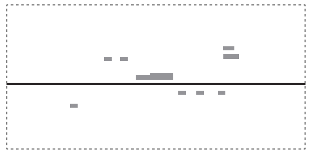


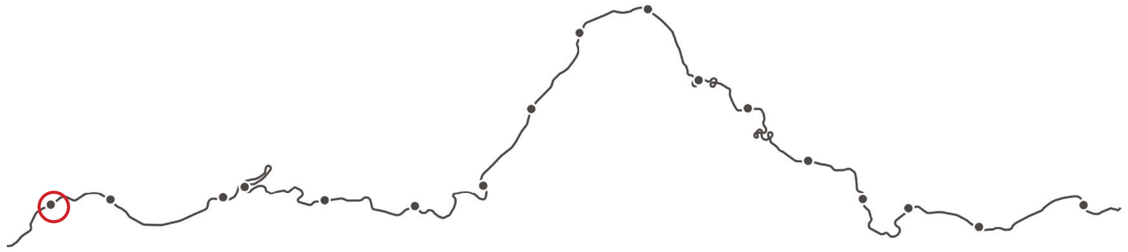


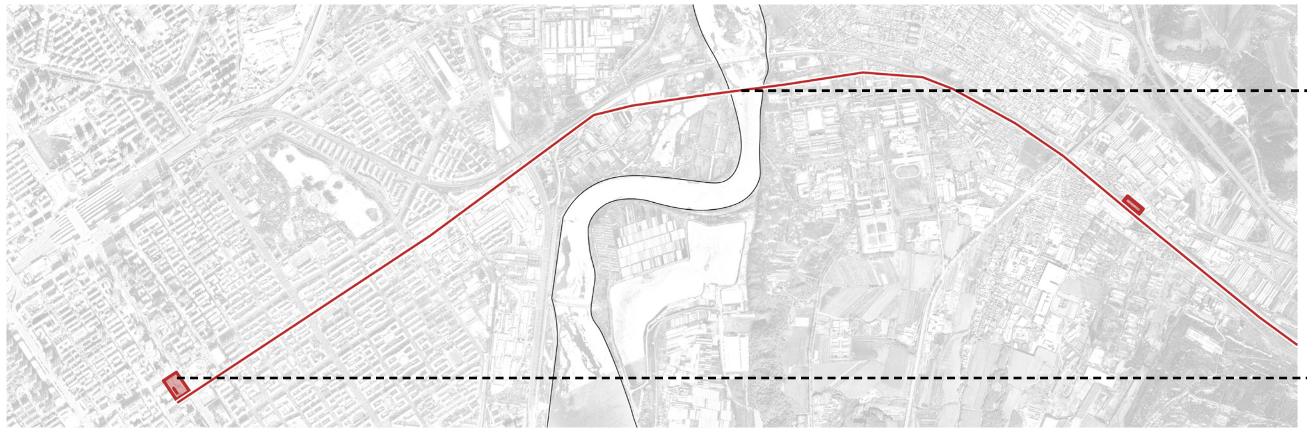
FIG. 6.4 Mudanjiang map/drawn by author(base map: Google Earth)

Mudanjiang is the starting city of the Musui line and also the largest city along the route. During the period of the China Eastern Railway, Mudanjiang station was initially classified as a fifth-class station, indicating its relatively lower status. Subsequently, due to Japanese occupation of the Northeast region, another railway line was constructed passing through Mudanjiang. This spurred significant development and expansion in Mudanjiang, transforming it into the largest city on the eastern line besides Harbin.

6.2.2 Design site1: Mudanjiang

History and heritage analysis

1901-1935 Russian control



First Mudanjiang railway station

Mudanjiang steel bridge

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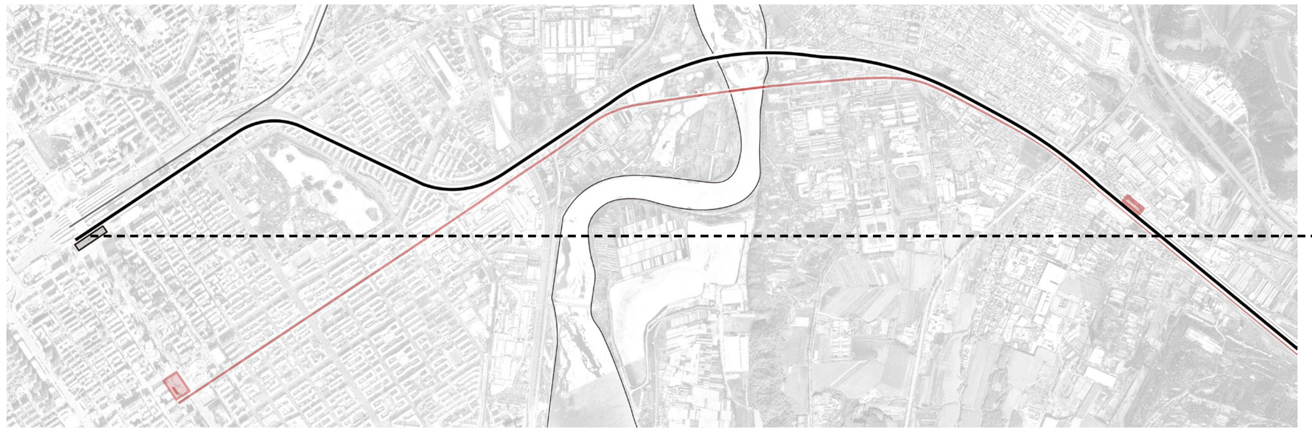
1935-1939 Japanese control



Old Mudanjiang railway station

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downloaded from: https://www.sohu.com/a/273864753_100200325

now fast railway development

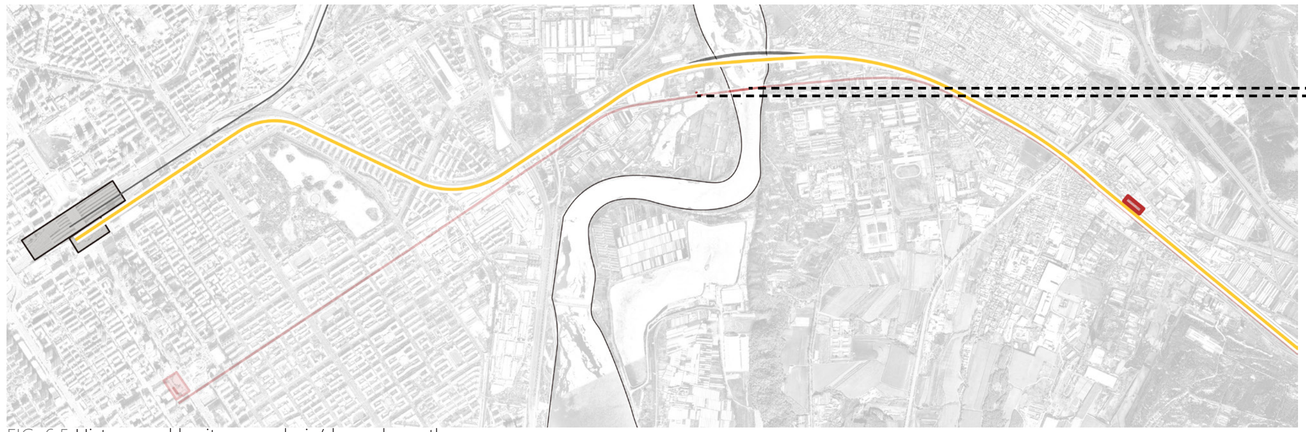
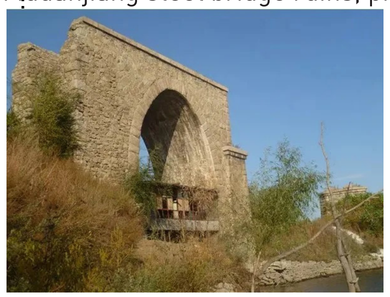


FIG. 6.5 History and heritage analysis/drawn by author

Mudanjiang steel bridge ruins, piers and fortification



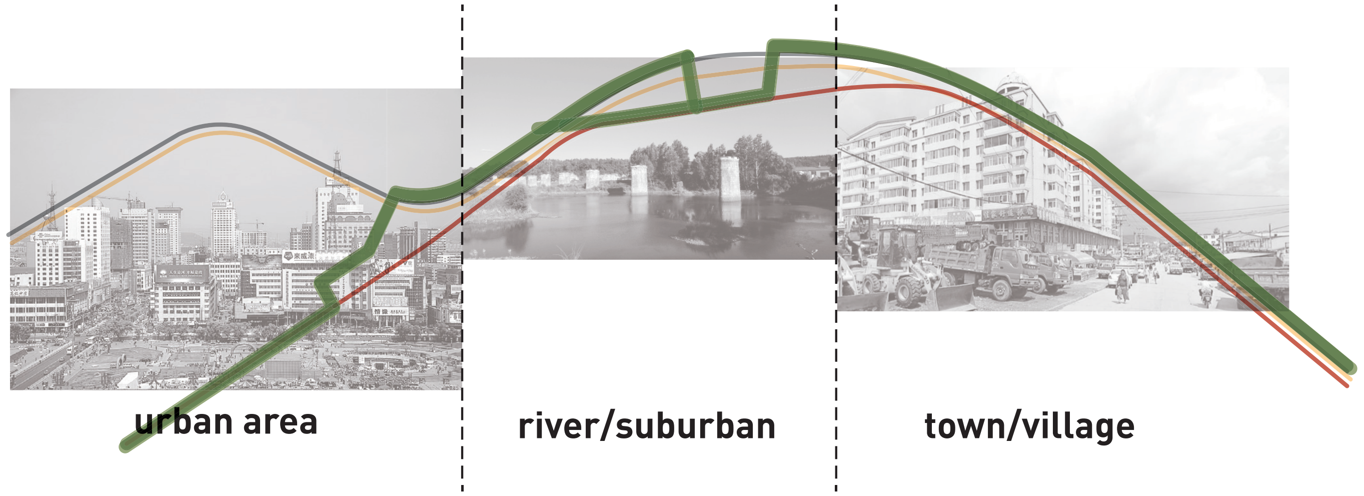
downloaded from: https://www.sohu.com/a/457878809_121005440ru/614/62512/160.htm?a=stdforum_

Mudanjiang City has two historic stations, but few historic buildings have been preserved. These sites are primarily located along the riverbanks and the station across the river. Along the riverbanks, remnants include one fortification and piers from the old railway bridge. There are also six remaining heritage sites at the station including work areas and residential buildings.

Through historic analysis, I found traces of the Japanese occupation, Russian occupation, and modern Chinese development periods are evident through railway heritage. During the Russian occupation, railway stations and bridges were constructed. During the Japanese occupation, tracks and bridges were dismantled, and a new railway station was built. In the modern Chinese development era, the original stations from the Russian period were dismantled initially, followed by the demolition of the Japanese-era railway bridge to make way for a new high-speed railway bridge. As a result, within the city, there is a disappeared railway station and a section of railway tracks, while remnants of all the railway bridges lie in ruins on the river, flanked by the new high-speed railway bridge.

6.2.2 Design site1: Mudanjiang

Green and historic connection



I intend to reinterpret the disappeared railway lines in urban and suburban areas using green pedestrian paths, emphasizing railway memory and identity. These paths will connect heritage sites dispersed along both banks of the river, guiding people from urban areas to the riverside to appreciate the river landscapes and historic buildings. Another name "Huanghuadianzi" station for the Mudanjiang Railway Station historically referred to the banks of the local river covered with yellow daylilies. Therefore, I plan to recreate this historical landscape by planting daylilies along the riverbanks where three railway bridges run parallel, and different landscape interventions will be employed to enhance the presence of these bridge ruins while promoting ecological and recreational functions.

FIG. 6.6 Mudanjiang green railway path map/drawn by author

6.2.2 Design site1: Mudanjiang

Green connection

urban area——new green padestrain

before

downloaded from: https://www.sohu.com/a/273864753_100200325

current

downloaded from: Baidu street map

design vision

FIG. 6.7 Design vision for new green pedestrain/drawn by author

6.2.2 Design site1: Mudanjiang

Green connection

suburban area——green path

before

downloaded from Baidu street map

current

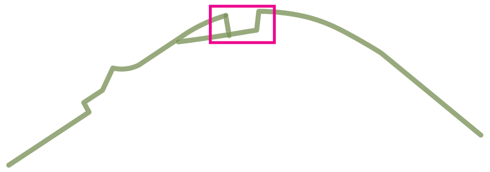
downloaded from: Baidu street map(redrawn by author)

design vision

FIG. 6.8 Design vision for new green pedestrain/drawn by author

6.2.2 Design site1: Mudanjiang

historic railway path



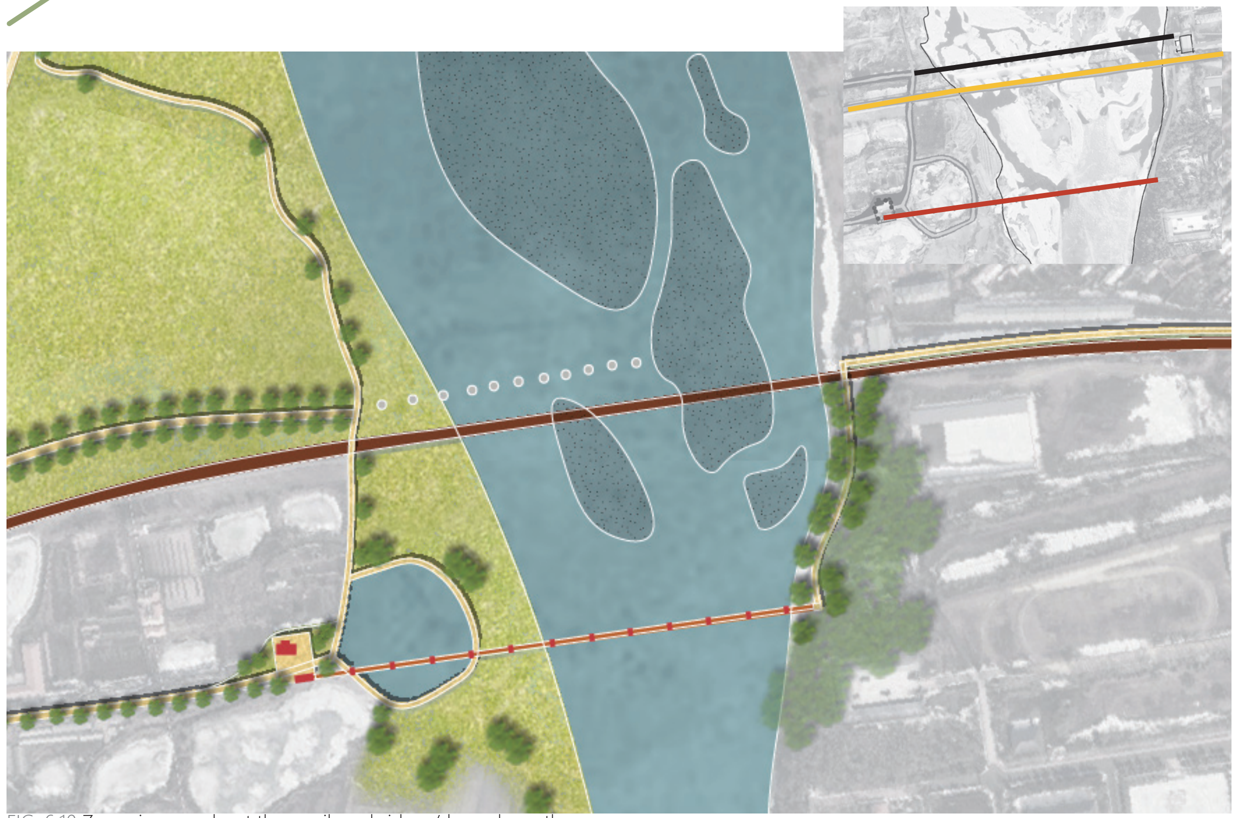


FIG. 6.10 Zoom in map about three railway bridges/drawn by author

The remaining structures of Japanese railway bridges consist only of fragmented pillar bases. My plan involves using additional broken bricks to increase their height and filling them with soil to transform them into ecological mini-green islands on the river. These islands will serve as nesting and perching spots for birds. Furthermore, for the disused Russian railway bridges, I propose repurposing their piers by reconstructing them with steel frames to create pedestrian bridges spanning the river, enhancing their accessibility and functionality for pedestrians.

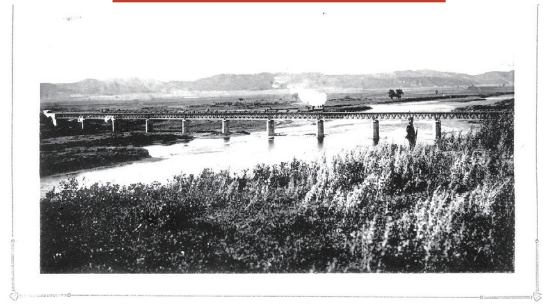
Japanese bridege

downloaded from: https://www.sohu.com/

fast railway bridge

Photo: taken by author

Russian bridege



downloaded from: https://www.sohu.com/

Japanese bridege ruins

google earth

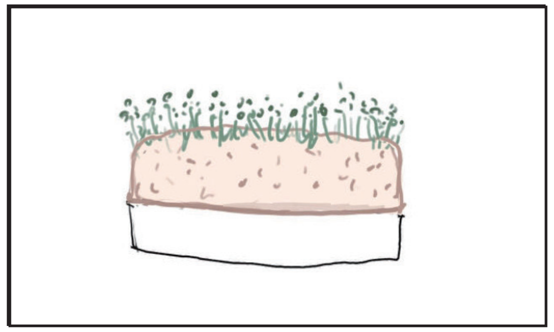
fast railway bridge

Photo: taken by author

Russian bridege piers

downloaded from: https://www.sohu.com/

ecological island



fast railway bridge

taken by author

pedestrian bridge

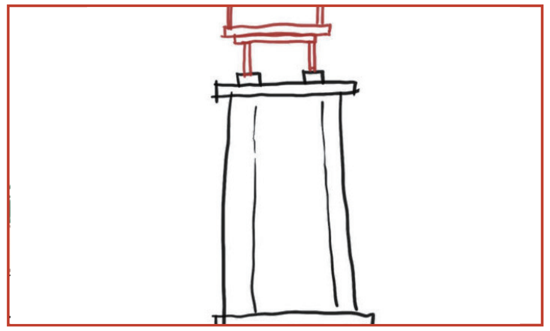


FIG. 6.9 Before, current, future for railway bridges/drawn by author

6.2.2 Design site1: Mudanjiang

historic railway path

Japanese bridege —— ecological island

FIG. 6.11 small greed ecological island/drawn by author

Russian bridege —— pedestrian bridge

FIG. 6.12 new pedestrain bridge/drawn by author

6.2.3 Design site2: Muling

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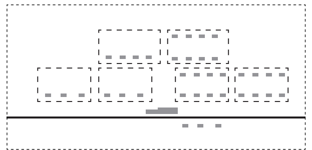

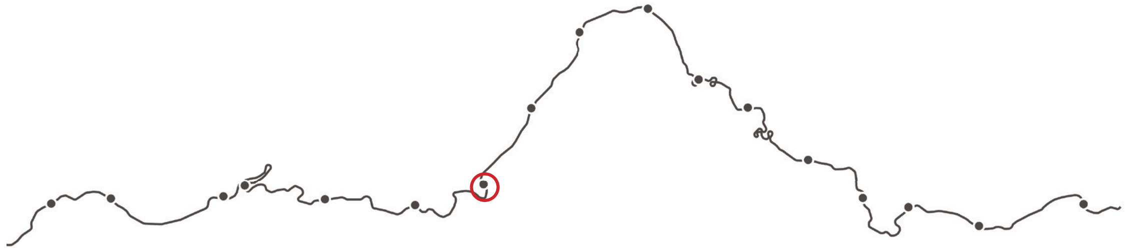

FIG. 6.13 Muling map/drawn by author(base map: Google Earth

Muling Town is one of the larger towns along the Musui Line, positioned roughly in the middle section of the line. Historically designated as a Class III station, the town boasts lots of heritage buildings and facilities. Located amidst a hillside, Muling is enveloped by hills on all sides, offering views of distant, rolling mountain ranges from within the town itself.

6.2.3 Design site2: Muling

Heritage analysis

residential buildings

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https://down-Þles.2bulu.com/f/d1?downParams=JScdpoZEwxgr0OBxohfNOA%3D%3D%0A

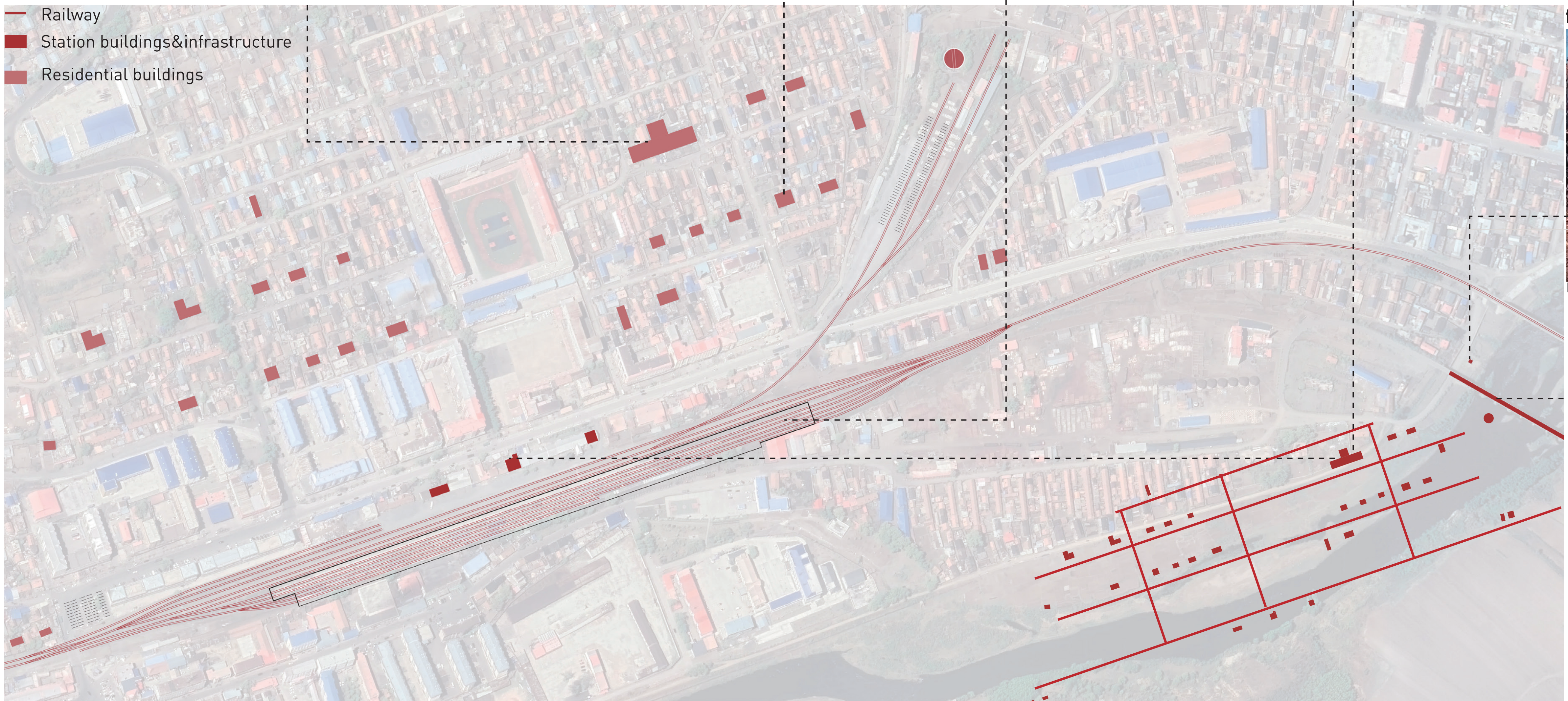
locomotive warehouse

https://matters.town/a/9ncovnvzs4i2

railway station

https://down-Þles.2bulu.com/f/d1?downParams=LzV2JBPZmI8r0OBxohfNOA%3D

Muling Town possesses a wealth of heritage sites, including railway bridges and locomotive depots, which are of significant engineering value. The historic road network of the town has largely been preserved. The Muling Railway Station also serves as a locomotive parking lot, housing various types of locomotive trains from across the northeastern region.



fortress ruins

https://matters.town/a/9ncovnvzs4i2

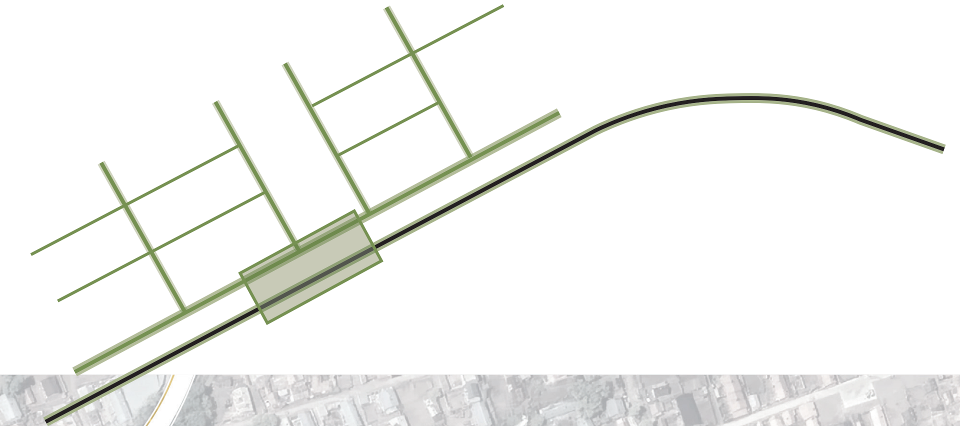
stone arch bridge

https://matters.town/a/9ncovnvzs4i2

FIG. 6.14 Muling heritage map/drawn by author(base map: Google Earth

6.2.3 Design site2: Muling

railway historic town



Despite the historic road network being largely preserved, its presence is not prominent, the square and axis in front of the train station have disappeared, and many heritage buildings are still obscured by walls. Therefore, I plan to construct green pedestrian streets along the historic roads and design a new square and axis in front of the station to restore historic spatial quality. These streets will feature markers indicating the heritage sites on both sides, guiding visitors along the route. Additionally, lowering the walls around heritage sites will make the buildings more visible.

I also propose transforming the locomotive parking lot into a train museum, utilizing the existing train resources. A pathway will be constructed along the disappeared railway line to connect and guide visitors to the river's bridges and fortress ruins. The area of the locomotive yard will serve as a parking lot, replacing the street-side parking spaces. Moreover, the abandoned locomotive turntable will be converted into a small garden.

FIG. 6.15 Muling historic landscape planning/drawn by author(base map: Google Earth)

6.2.3 Design site2: Muling

Station square

current situation

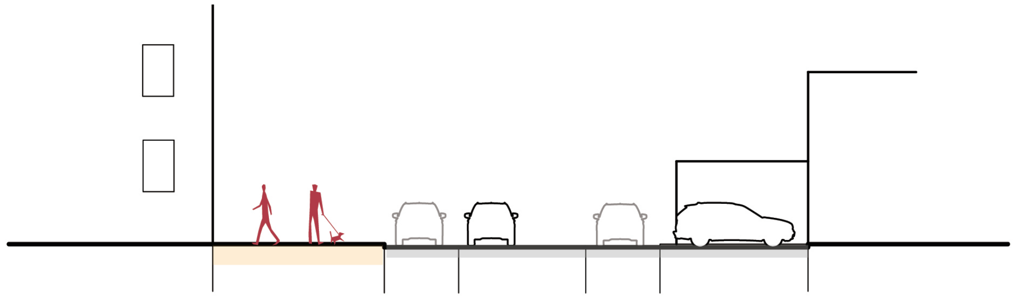
Muling station/taken by author

FIG. 6.16 perspective from station square/drawn by author

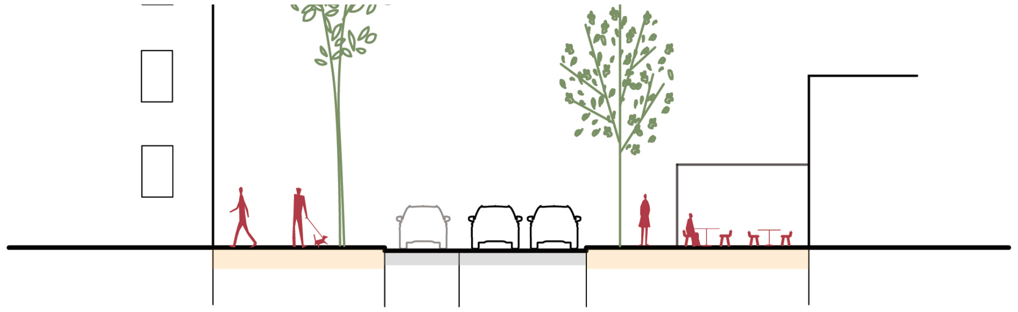
6.2.3 Design site2: Muling

Green streets——main street

now



design



now

taken by author

The original parking spaces will be reduced to a single row of street-side parking, leaving more space for pedestrians.

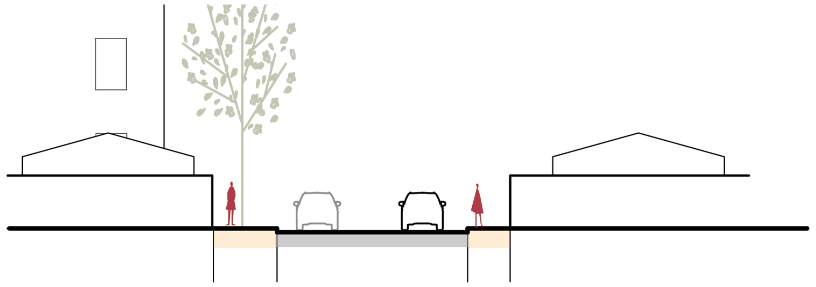
design vision

FIG. 6.17 perspective from main street /drawn by author

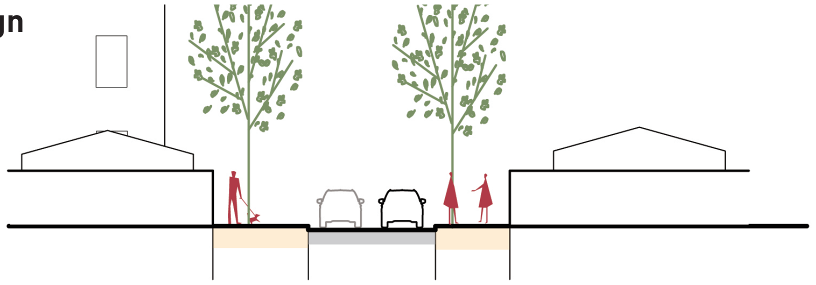
6.2.3 Design site2: Muling

Green streets——secondary street

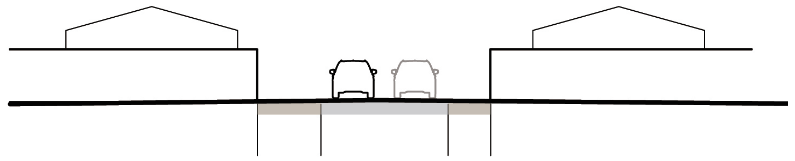
now



design



now



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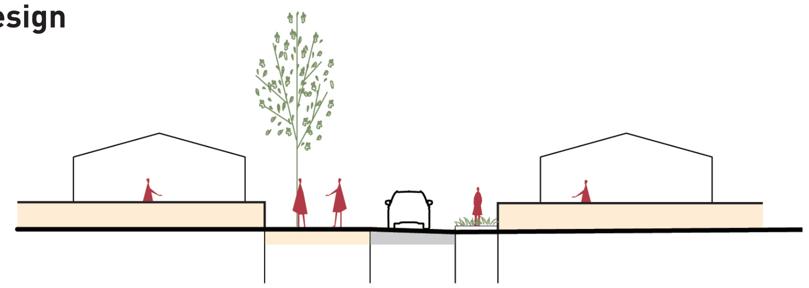


now

taken by author

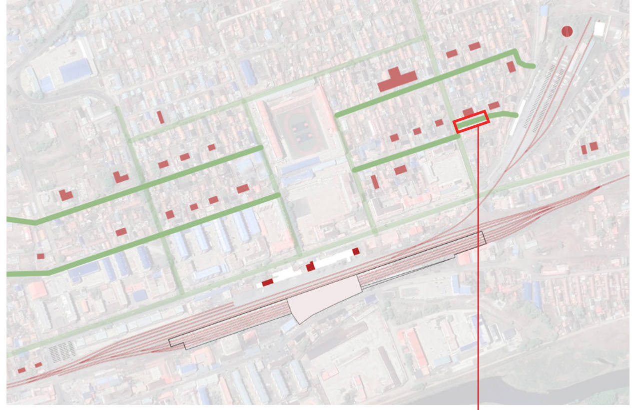
The three-lane roads will be reduced to two lanes, and the two-lane roads will be reduced to one lane, leaving more space for green paths. Markers can also be placed along the route to indicate the locations of heritage sites. Many roadsides feature open channels, remnants from the CER's construction period, which can be converted into ecological swales.

design vision

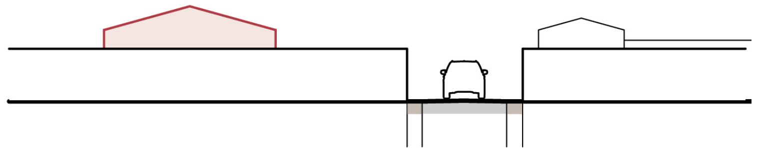
FIG. 6.18 perspective from secondary street /drawn by author

6.2.3 Design site2: Muling

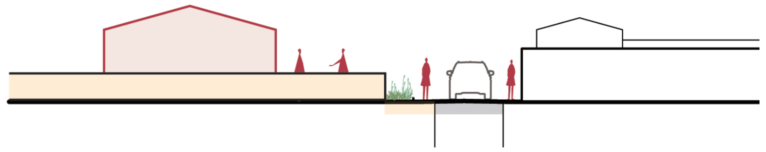
Green streets——shared street



now



design



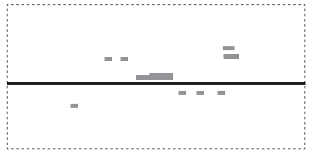
now

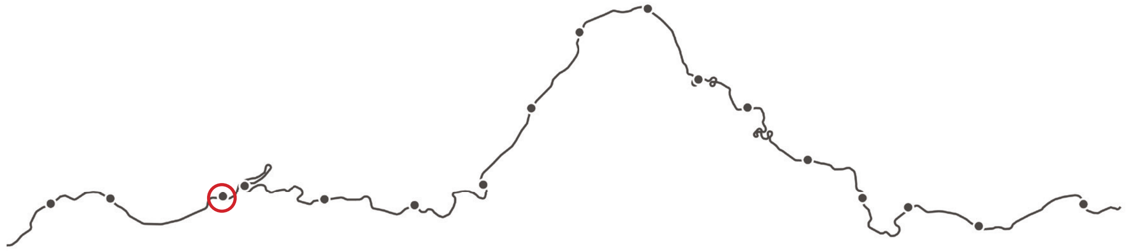
These small roads, mostly unpaved dirt paths, are typically only 4-5 meters wide and pass in front of many heritage building courtyards. I plan to pave these roads to serve as shared pathways for both pedestrians and vehicles. Signage can be installed along the road to indicate the locations of heritage sites. Additionally, the walls around heritage sites can be lowered and set back to create small front gardens. This approach not only references the historic landscape but also highlights the locations of the heritage sites.

design vision

FIG. 6.19 perspective from shared street /drawn by author

6.2.4 Design site3: Modaoshi





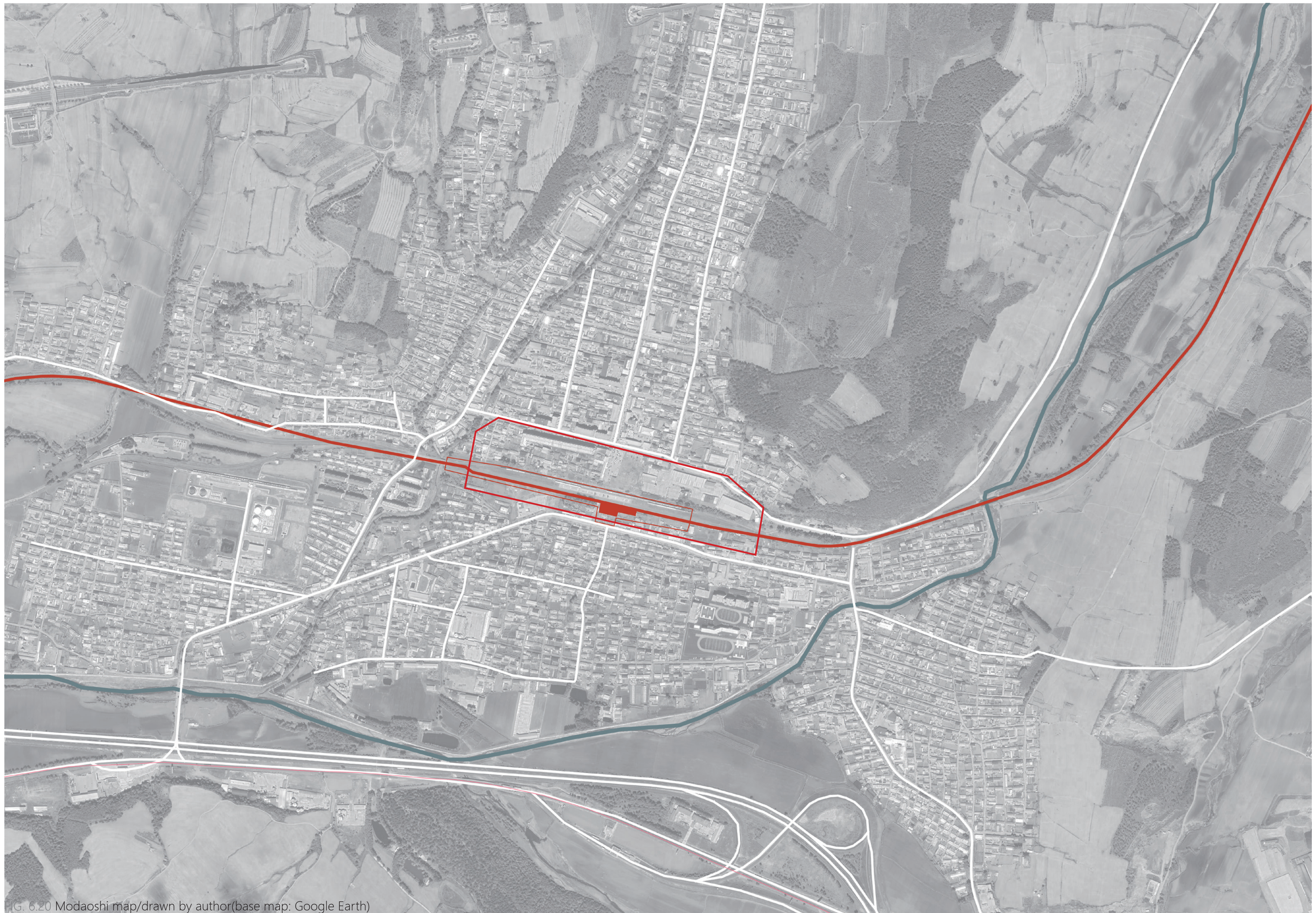


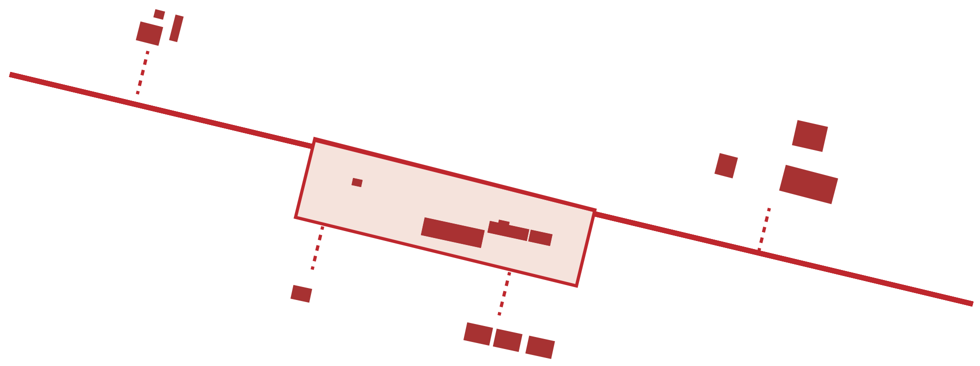
FIG. 6.20 Modaoshi map/drawn by author(base map: Google Earth)

Modaoshi is a medium-sized town along the Musui Line and was historically classified as a fourth-class station. Modaoshi Station marks the beginning of the Daguanling spiral loop line and is situated in a hillside area. There is a 3-4 meter elevation difference on either side of the railway, and the town is surrounded by rolling mountain ranges.

6.2.4 Design site3: Modaoshi

Heritage analysis

FIG. 6.2 Heritage analysis map/drawn by author



Modaoshi Town has 15 heritage buildings and facilities, including the station, granaries, work areas, residential buildings, and a stone arch bridge. Although there are no clearly defined historical streets, the town has largely retained the form typical of a fourth-class station. Most of the heritage buildings are concentrated in the station area.

warehouse

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working area

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residential building

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station building

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station toilet

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6.2.4 Design site3: Modaoshi

Site analysis

FIG. 6.22 Site analysis map/drawn by author

Chaotic Parking lot

Taken by author

Street market

Taken by author

Taken by author

The street behind the station is now the town center, where both buses and private cars park in the open area behind the train station. There is a market along this street and central street. This area is unmanaged and relatively chaotic. A cross-section view reveals a visual axis created by the elevation differences within the town.

Inactive station area

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Current section A-A'

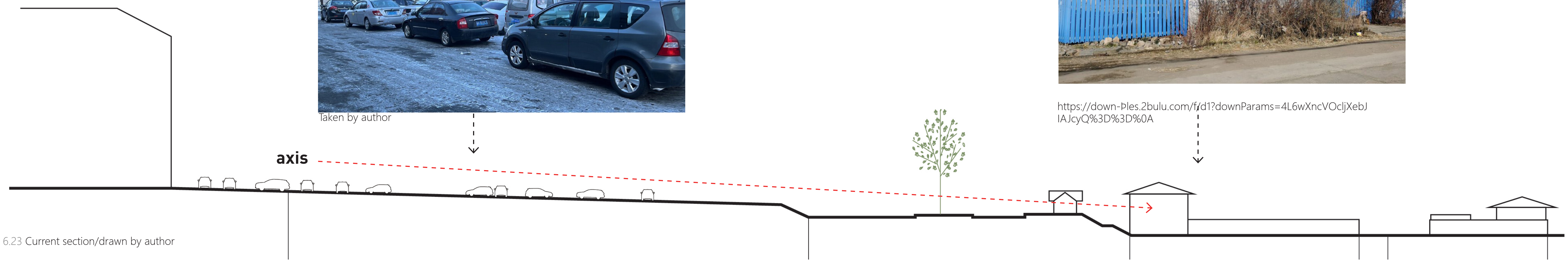

FIG. 6.23 Current section/drawn by author

6.2.4 Design site3: Modaoshi

Historic station center

The design aims to enhance the site's visual and spatial axis by creating a green axis. This green axis will guide the flow of people from the market and parking area to the garden in front of the train station and the heritage buildings along the street. Additionally, the design includes the construction of several roads leading to the granary area and work zones.

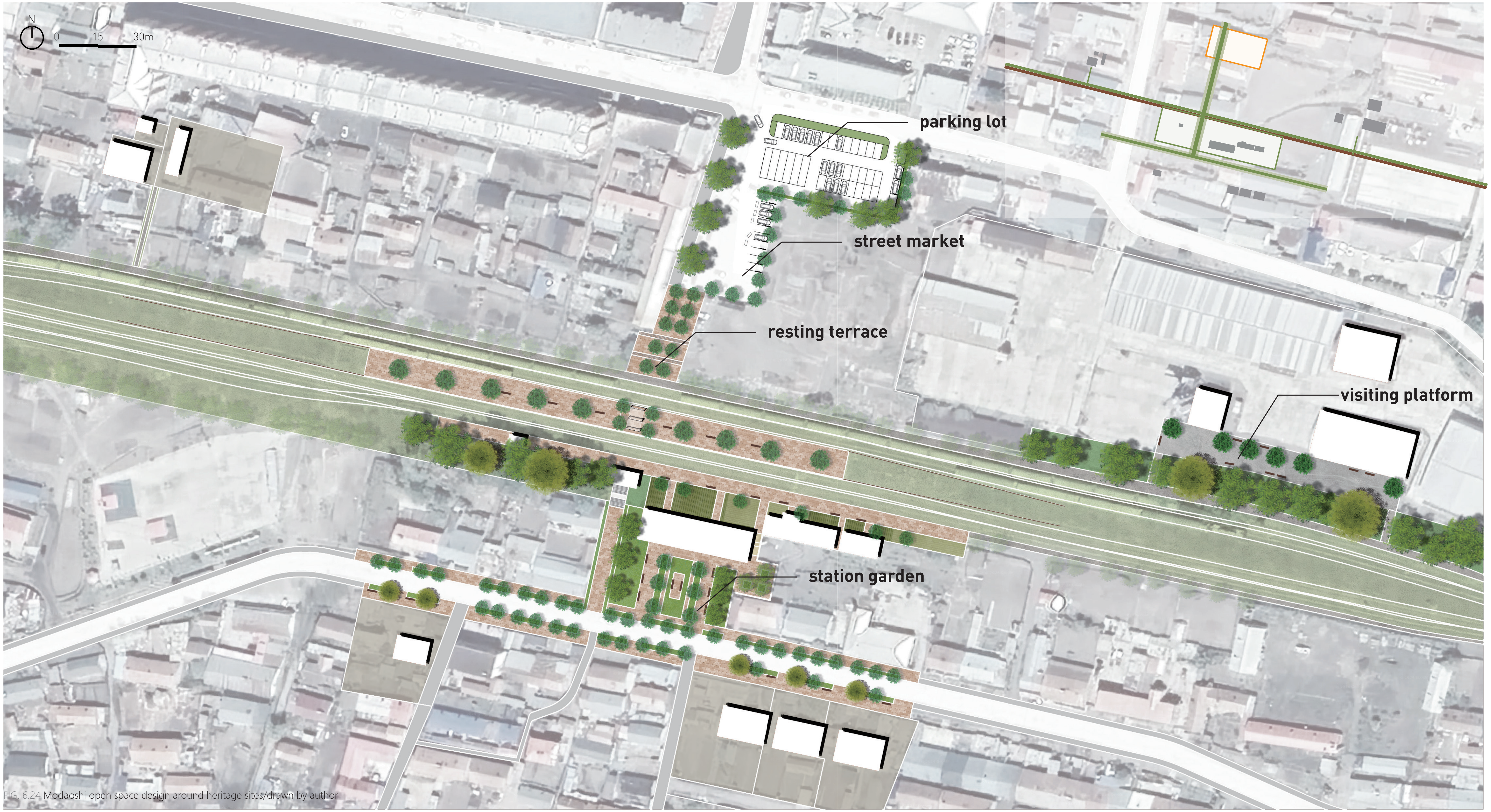

FIG. 6.24 Modaoshi open space design around heritage sites/drawn by author

6.2.4 Design site3: Modaoshi

New green axis

Zoom in green axis

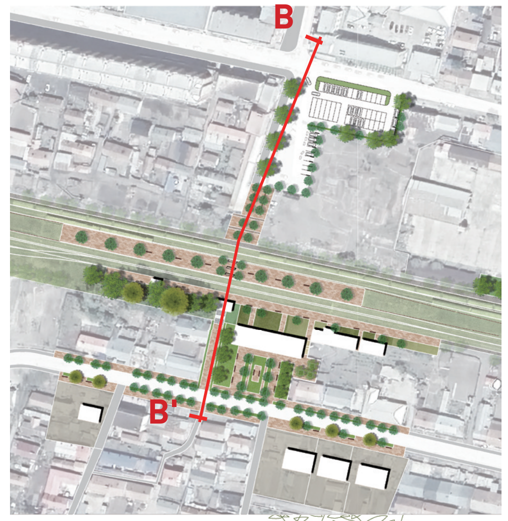

FIG. 6.25 Zoom in green axis/drawn by author

Site section B-B'

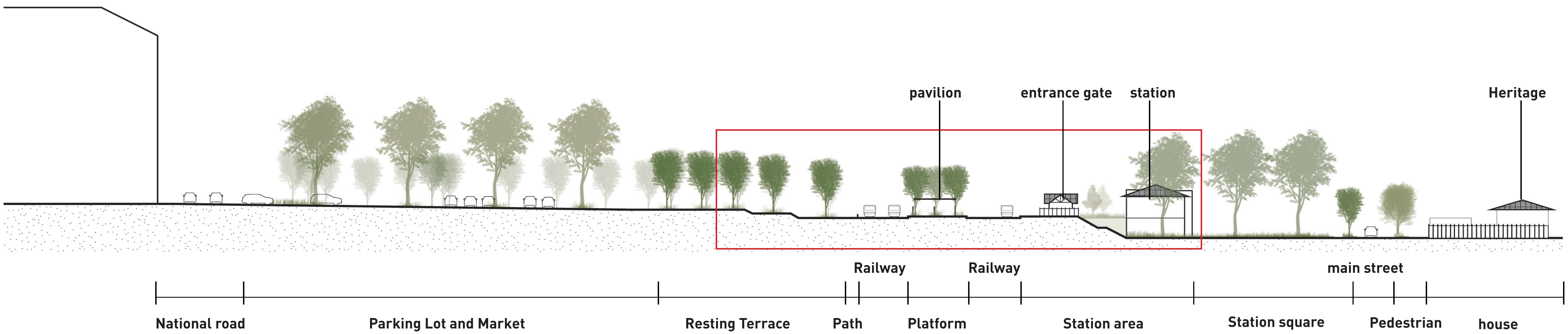

FIG. 6.26 Site section after design/drawn by author

6.2.5 Design site4: Daimagou

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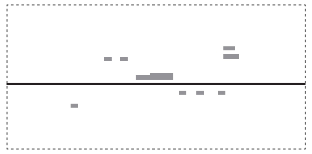

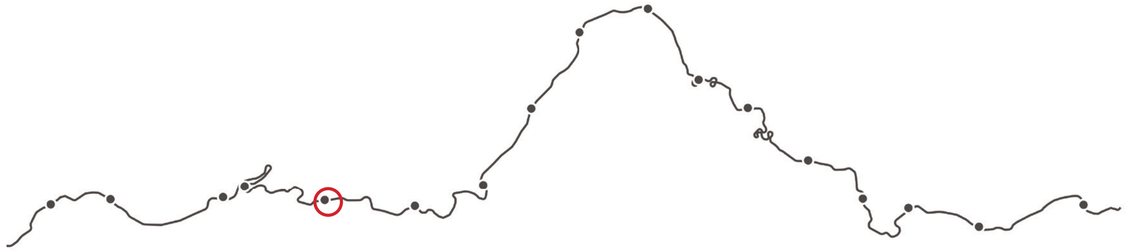

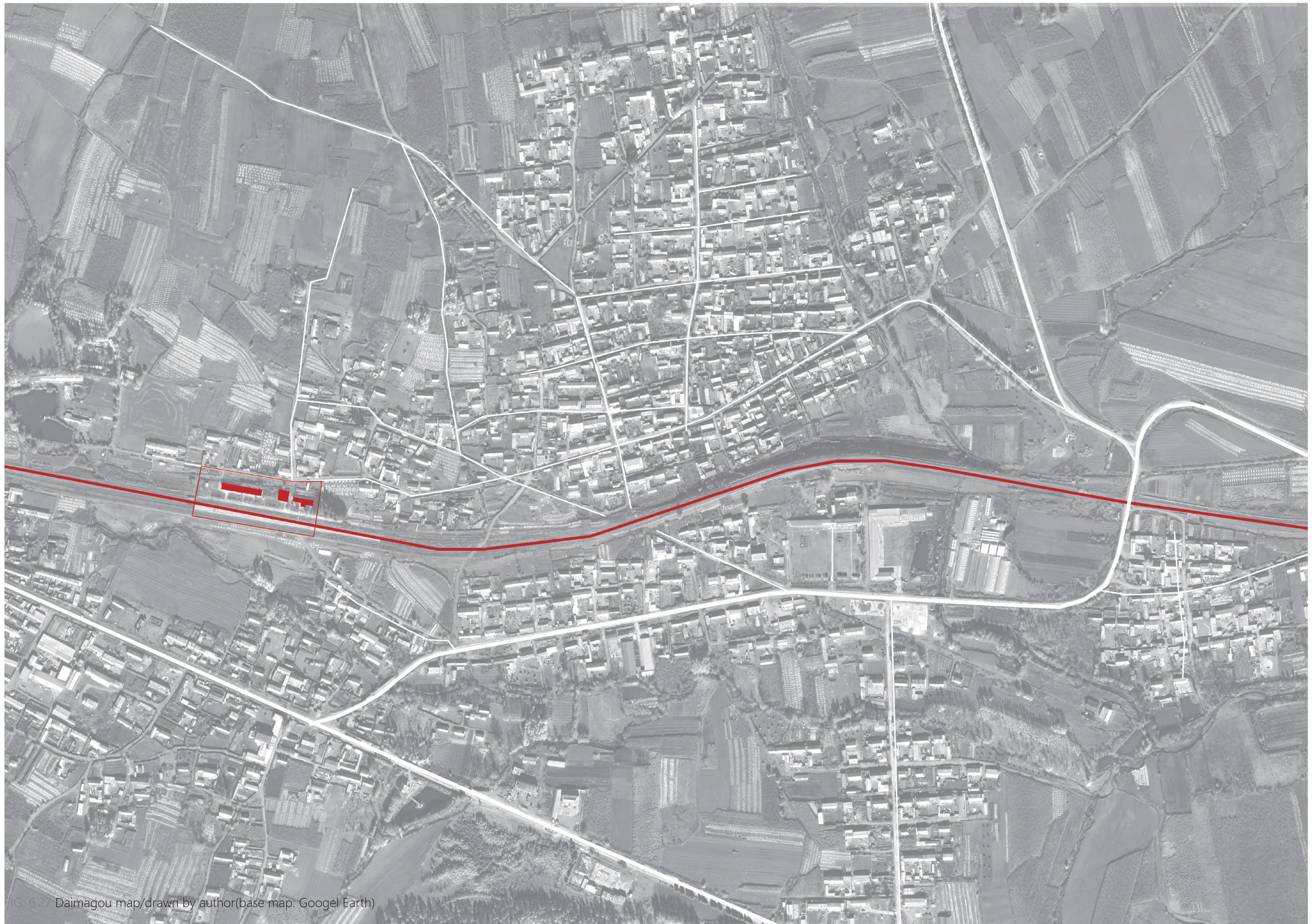

FIG. 6.27 Daimagou map/drawn by author(base map: Googel Earth)

Daimagou is an ordinary village along the Musui Line and marks the end of the Daguanling spiral loop line. Historically, it was classified as a fourth-class station. Compared to the previously mentioned urban patches, Daimagou has a more level terrain and is surrounded predominantly by farmland.

6.2.5 Design site4: Daimagou

Heritage analysis

station building

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residential building

https://down-Þles.2bulu.com/f/d1?downParams=K1pgeWJrbtYef9MgRK08oQ%3D%3D%0A

water pump house

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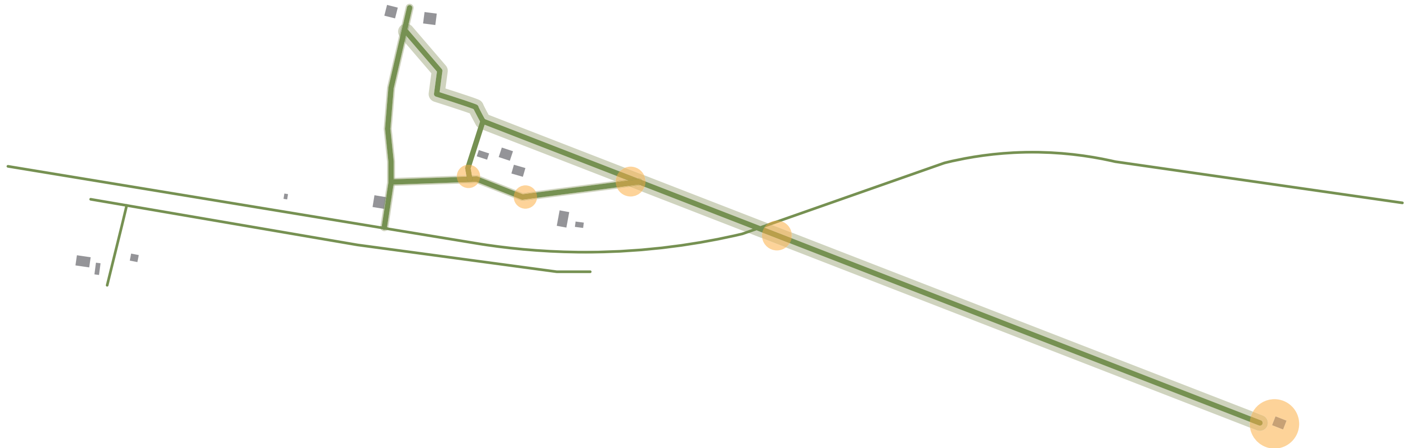
The heritage sites in Daimagou are widely dispersed, and the village lacks a clear road structure. Among heritage buildings, the water pumping station is located near a pond, almost on the village's periphery, and is far removed from the other heritage buildings.

FIG. 6.28 Heritage analysis map/drawn by author

6.2.5 Design site4: Daimagou

Historic village

The design aims to integrate the dispersed heritage buildings by utilizing existing roads and creating green connections, such as planting trees in the flat fields and adding public space nodes within the village. Also, strengthens the connection between the heritage sites and the national highway. The square in front of the train station can be used for the village market, and the station building can also serve as a community center, revitalizing the heritage buildings while enhancing their service functions. The water pumping station, located by the pond, offers a pleasant view. Green pathways will guide people from the village to the pond, where they can enjoy the scenery and rest at a café or other resting places adapted from the water pump house.



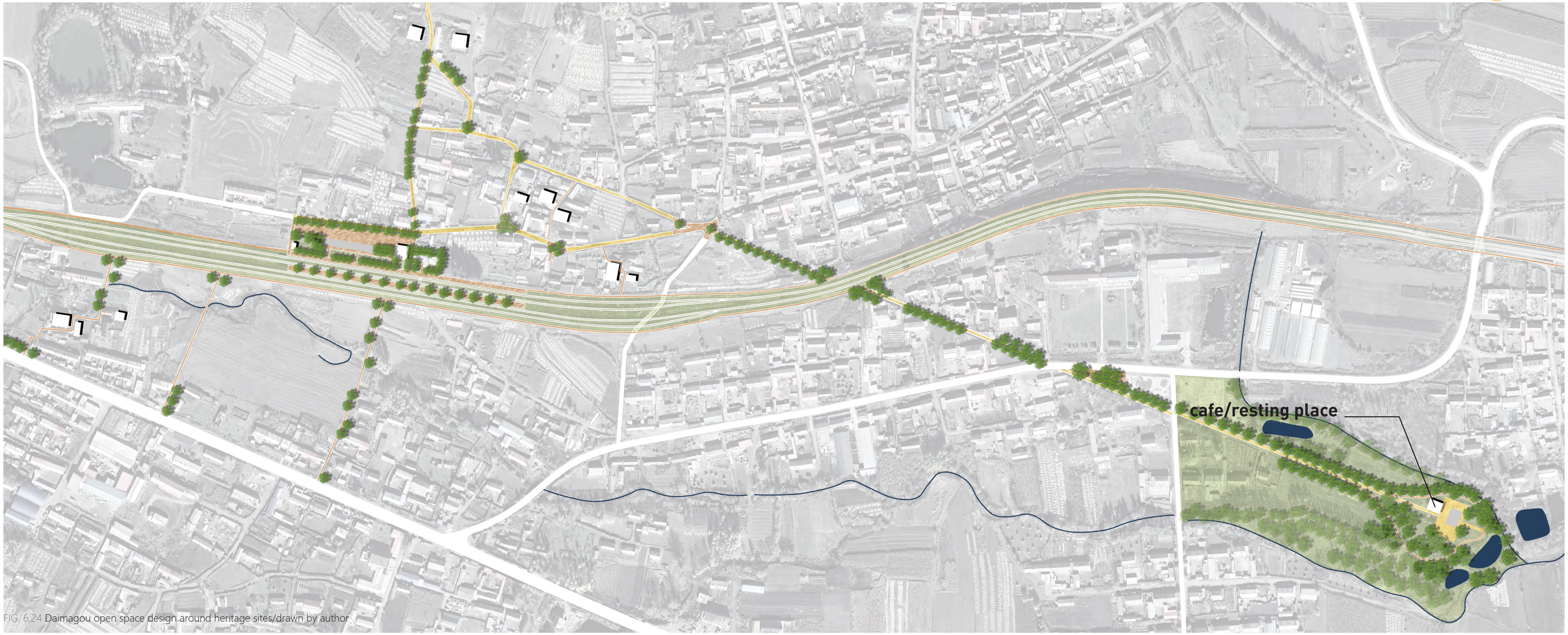


FIG. 6.24 Daimagou open space design around heritage sites/drawn by author

6.2.5 Design site4: Daimagou

The path to the pond

small public square

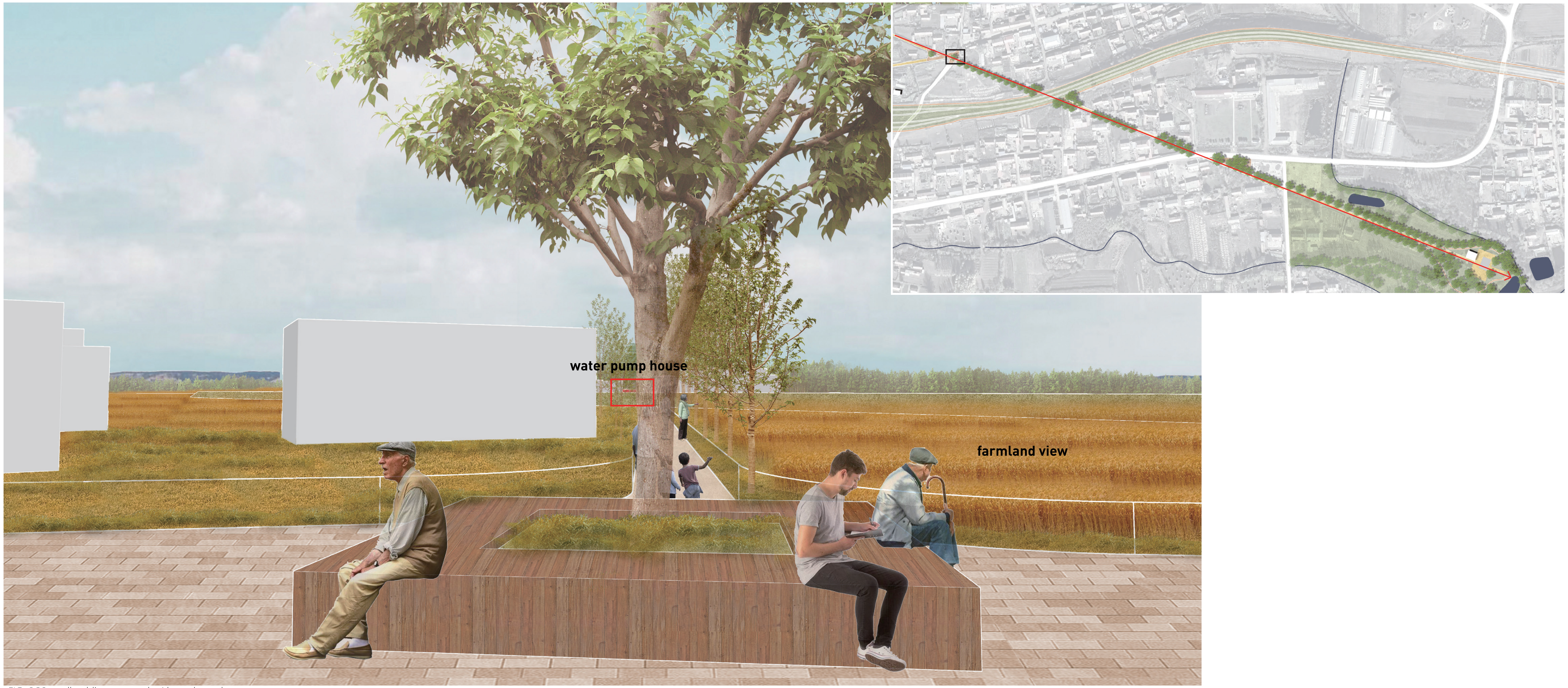


FIG. 6.30 small public space nodes/drawn by author

6.2.5 Design site4: Daimagou

The path to the pond

tree lines

FIG. 6.31 tree lines/drawn by author

6.2.5 Design site4: Daimagou

The path to the pond

the path through trees and by the pond

FIG. 6.32 the path through trees and by the pond/drawn by author

6.2.6 Design site5: Daguanling Spiral Line

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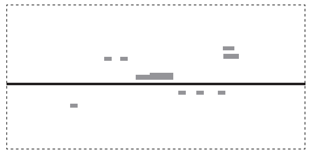
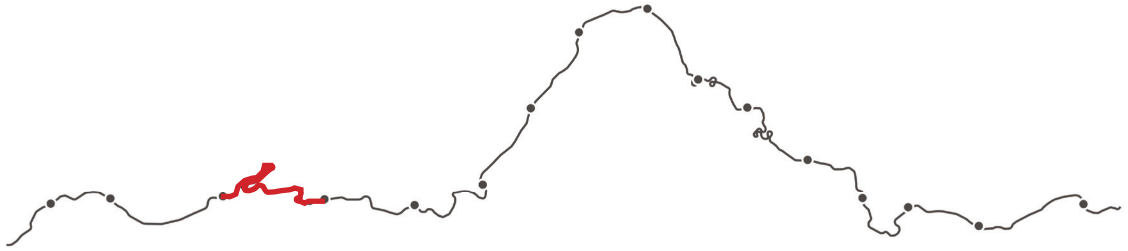




Daguanling spiral loop map/drawn by author(base map:Google Earth)

The Daguanling spiral loop comprises three levels, spanning approximately 26 kilometers with a cumulative elevation gain of 300 meters. Along the route, it passes through five train stations. The railway winds through the mountains, offering beautiful views of farmland and hilly forest landscapes. Abandoned heritage buildings were scattered along the way. This line is rich in both cultural and natural resources.

6.2.6 Design site5: Daguanling Spiral Line

Heritage analysis

Besides the starting and ending train station, the Daguanling spiral loop line features three stations along its route. Near each station, there are scattered heritage buildings, including stone arch bridges, tunnels, station buildings, and residential structures, all of which are in various states of abandonment.

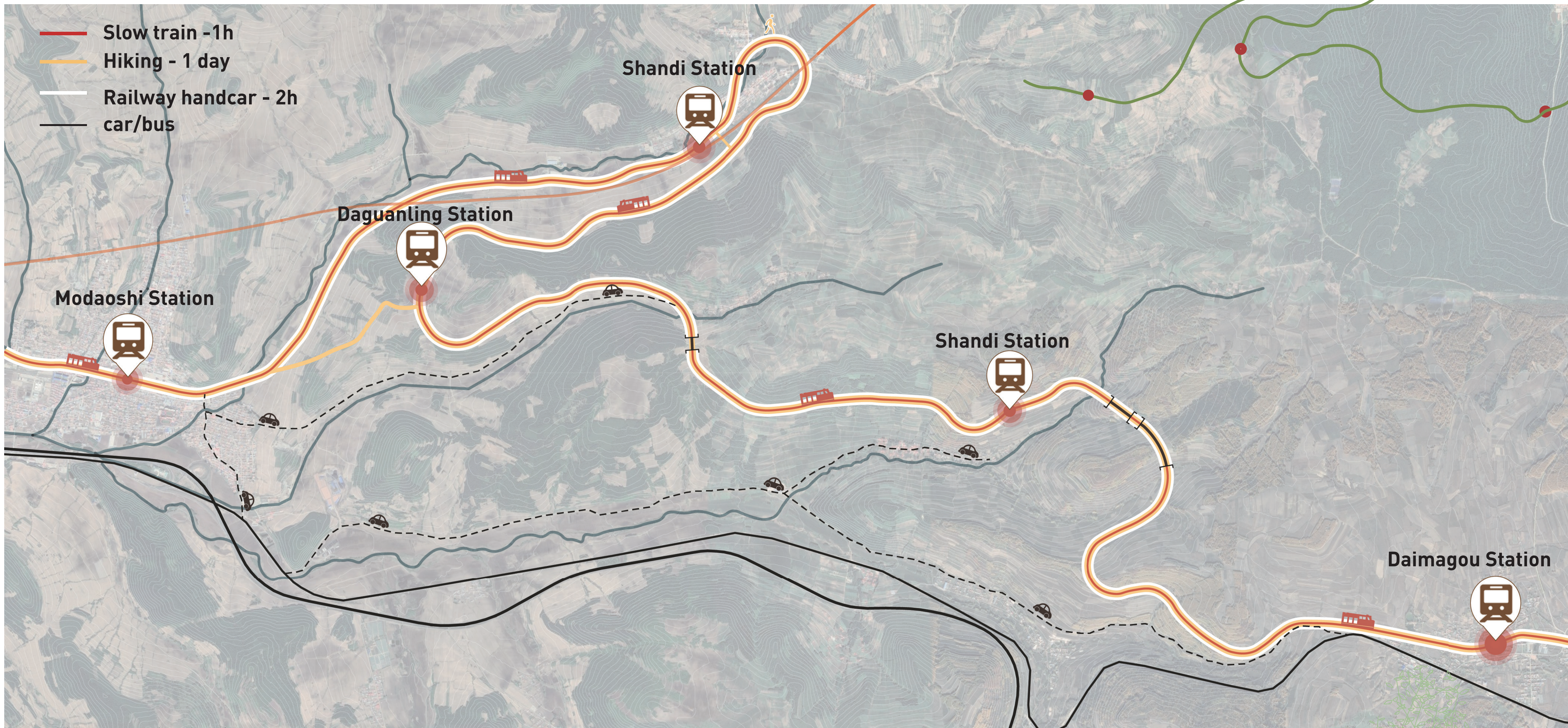
residential building

stone arch bridge

FIG. 6.34 Daguanling heritage analysis map/drawn by author

6.2.6 Design site5: Daguanling Spiral Line

hiking route



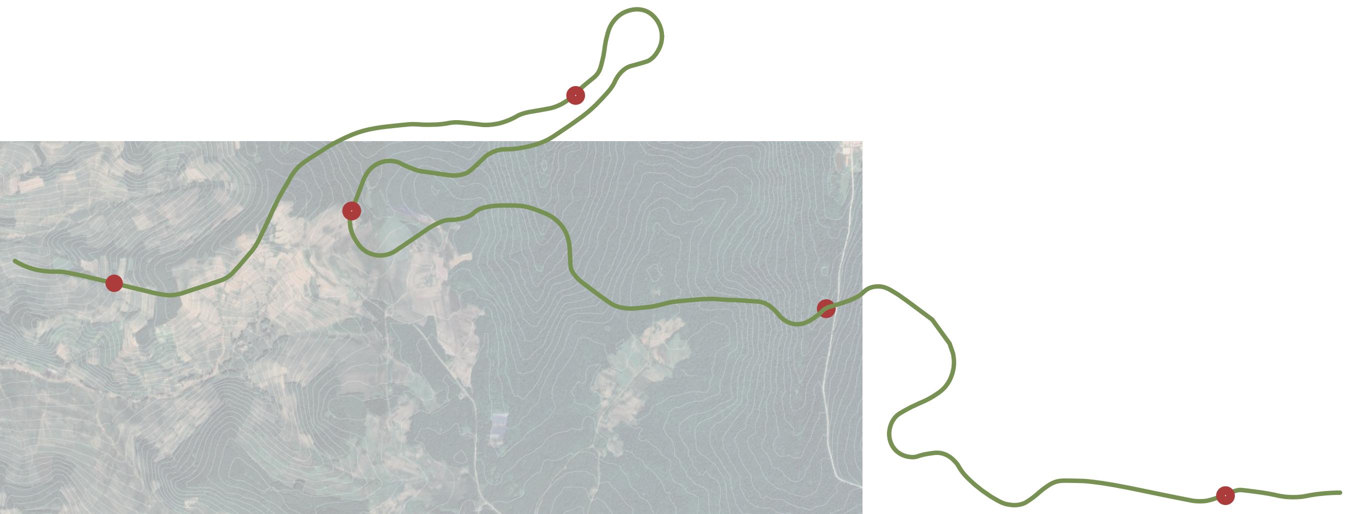


FIG. 6.35 Hiking route map/drawn by author

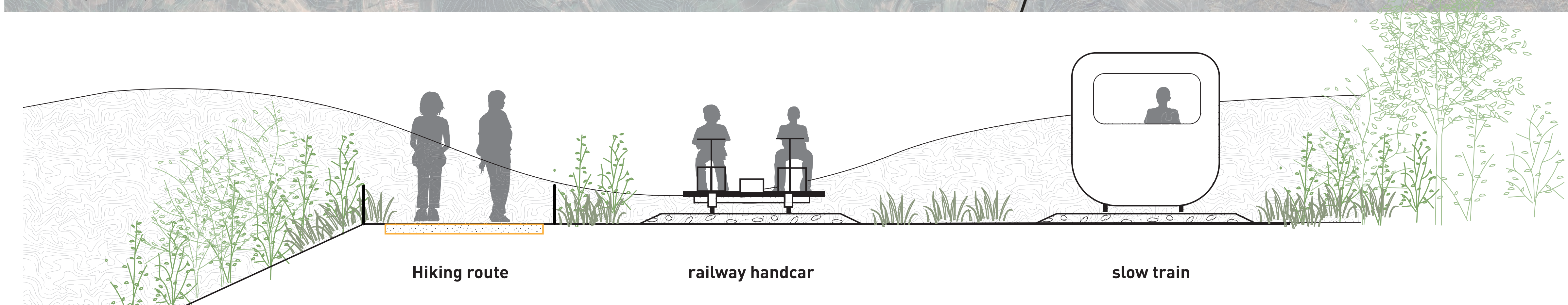


FIG. 6.36 Different transportations/drawn by author

6.2.6 Design site5: Daguanling Spiral Line

Route and attractions

Five train stations will serve as rest stops and visitor centers, where visitors can rest, switch modes of transportation, and obtain information about attractions. Heritage buildings and facilities along the spiral loop will be redeveloped into rest areas and viewpoints, integrating with the surrounding landscape. For example, a viewing platform can be added to a railway bridge, and scenic viewpoints can be established at mountain train stations. In the node design, five heritage sites have been selected. These heritage sites can either serve as structures themselves or be integrated into the landscape, taking advantage of their picturesque settings and expansive

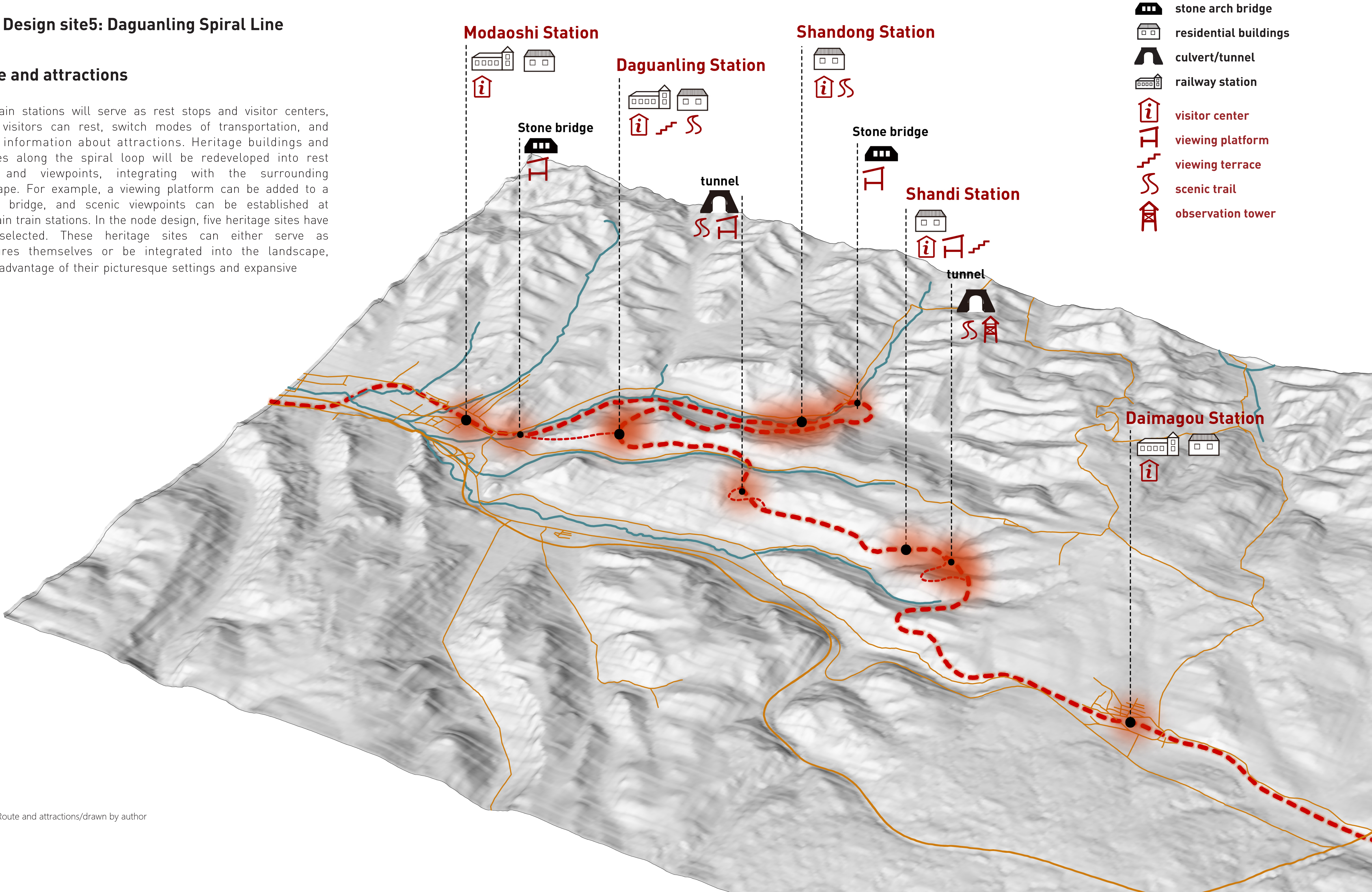
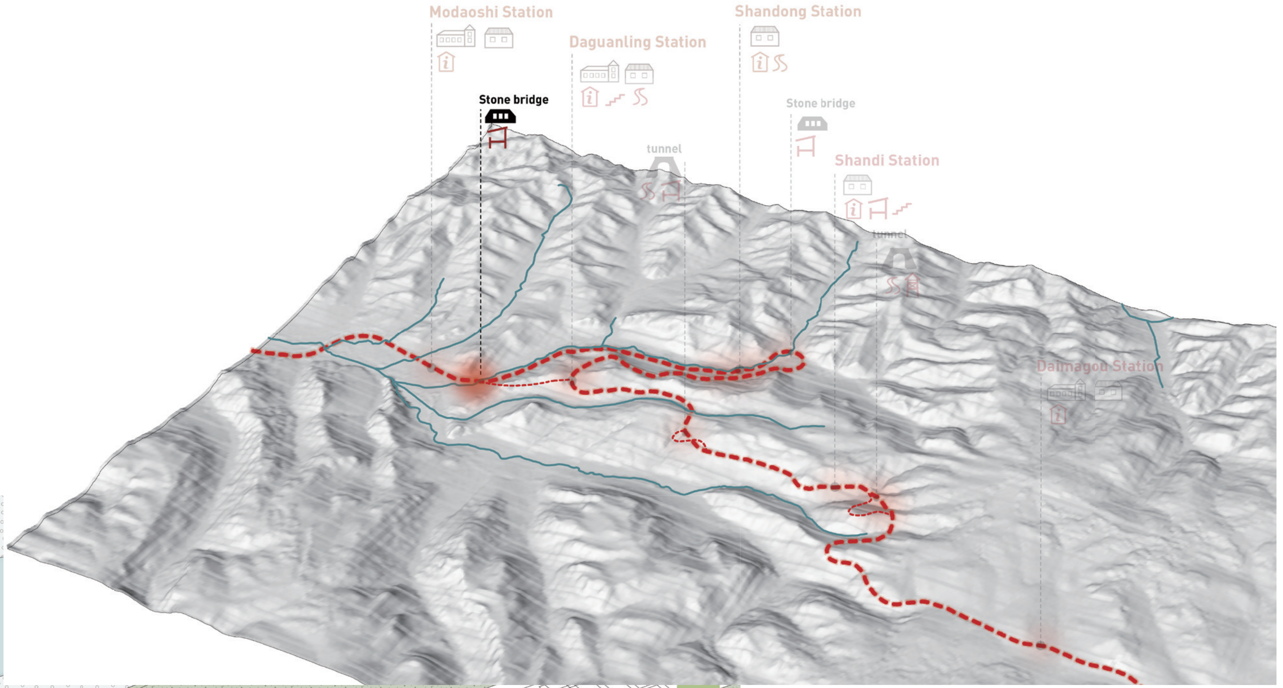


FIG. 6.37 Route and attractions/drawn by author

6.2.6 Design site5: Daguanling Spiral Line



Attractions transformed from historic buildings/facilities

Design plot1: a viewing platform

The stone arch bridge spans a small river, situated in the middle of a valley, offering excellent views of distant mountains and a newly constructed high-speed railway bridge from this location. Therefore, adding an observation platform on the bridge will allow people to pause, rest, and enjoy the scenery.

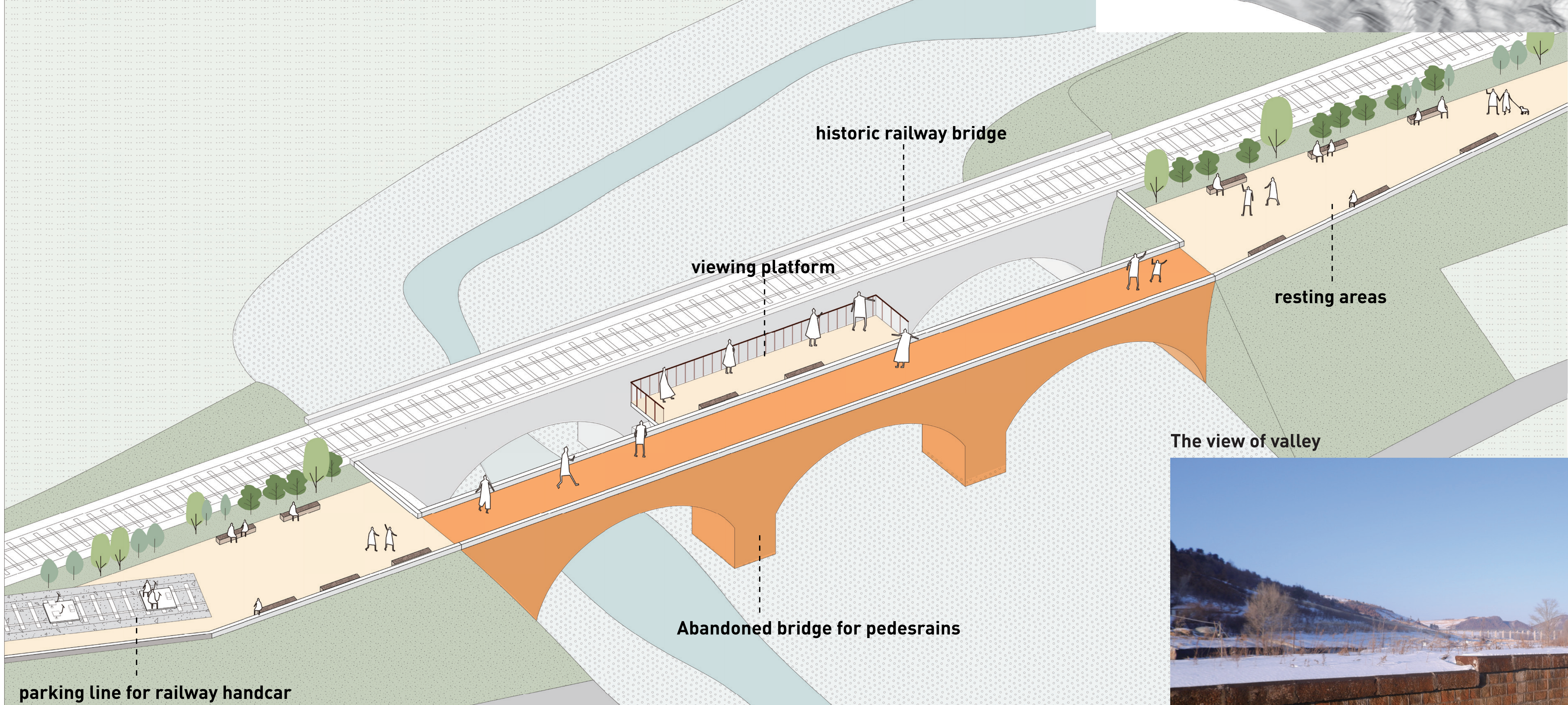
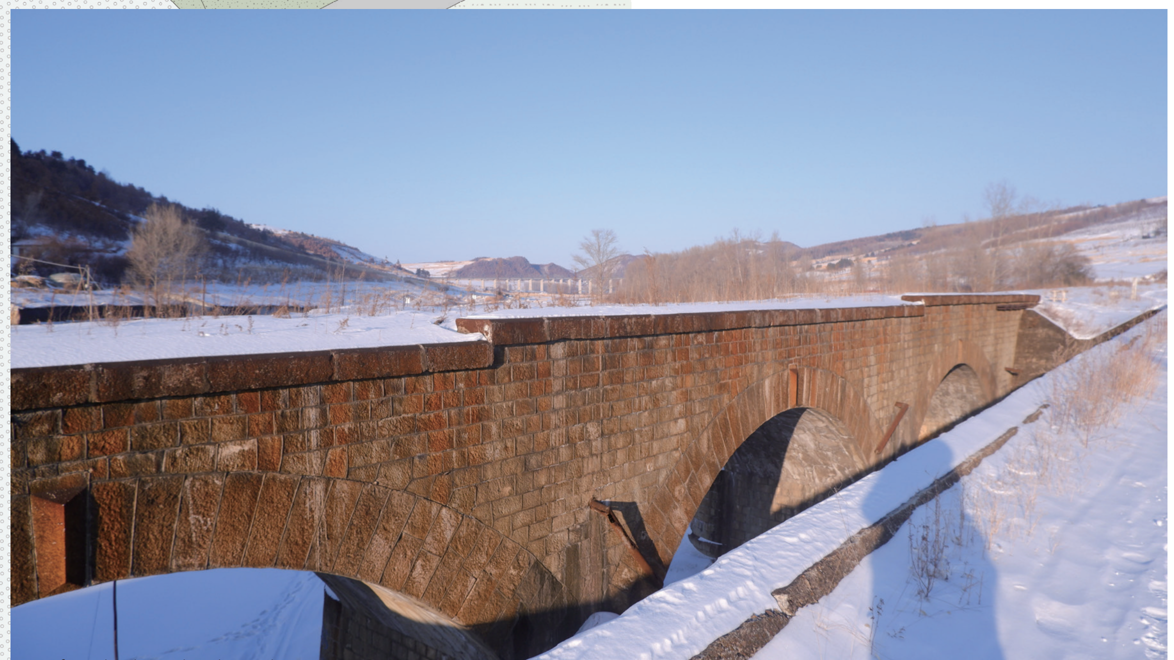


FIG. 6.38 Design plot1: a viewing platform/drawn by author

The view of valley



view from bridge/taken by author

6.2.6 Design site5: Daguanling Spiral Line

Attractions transformed from historic buildings/facilities

Design plot1: a viewing platform

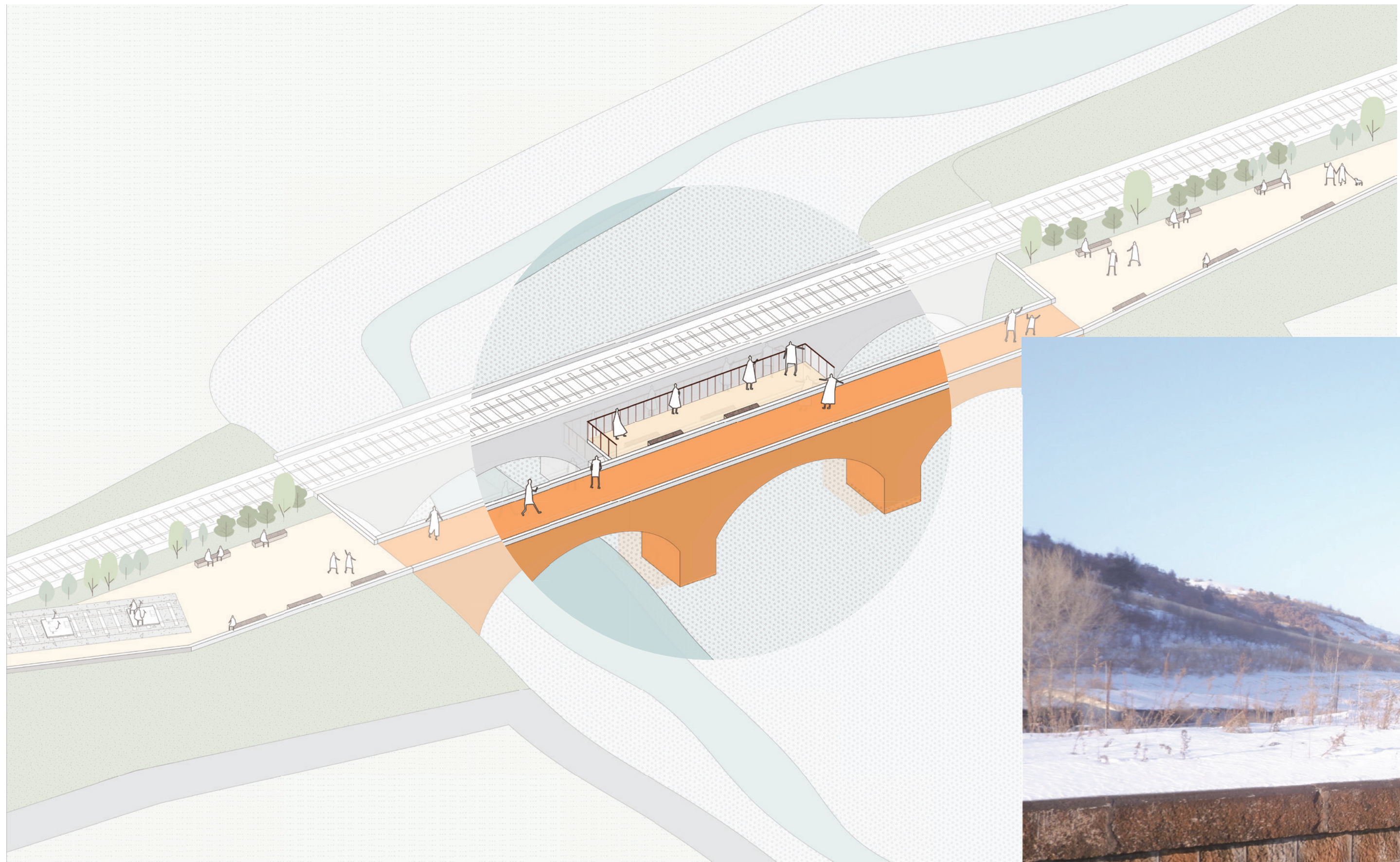


FIG. 6.39 view from platform/drawn by author

6.2.6 Design site5: Daguanling Spiral Line

Attractions transformed from historic buildings/facilities

Design plot2: A pathway connecting the two levels of the railway spiral loop line

The design involves constructing a new pathway to connect the two levels of the railway loop line. Along this pathway, visitors will pass by rest pavilions transformed from heritage buildings and a newly built viaduct. The route will provide an opportunity to experience the contrast between history and modernity.

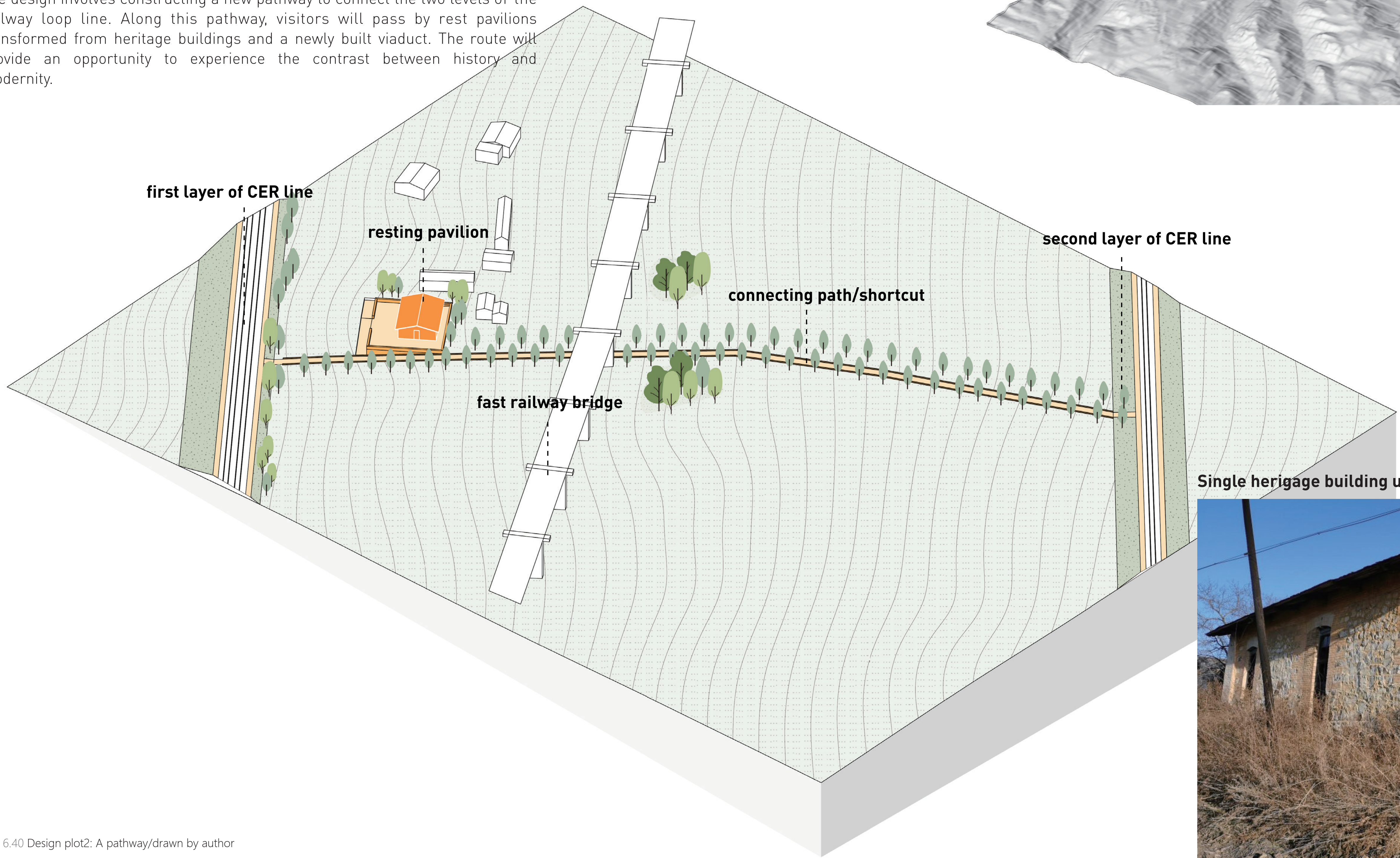
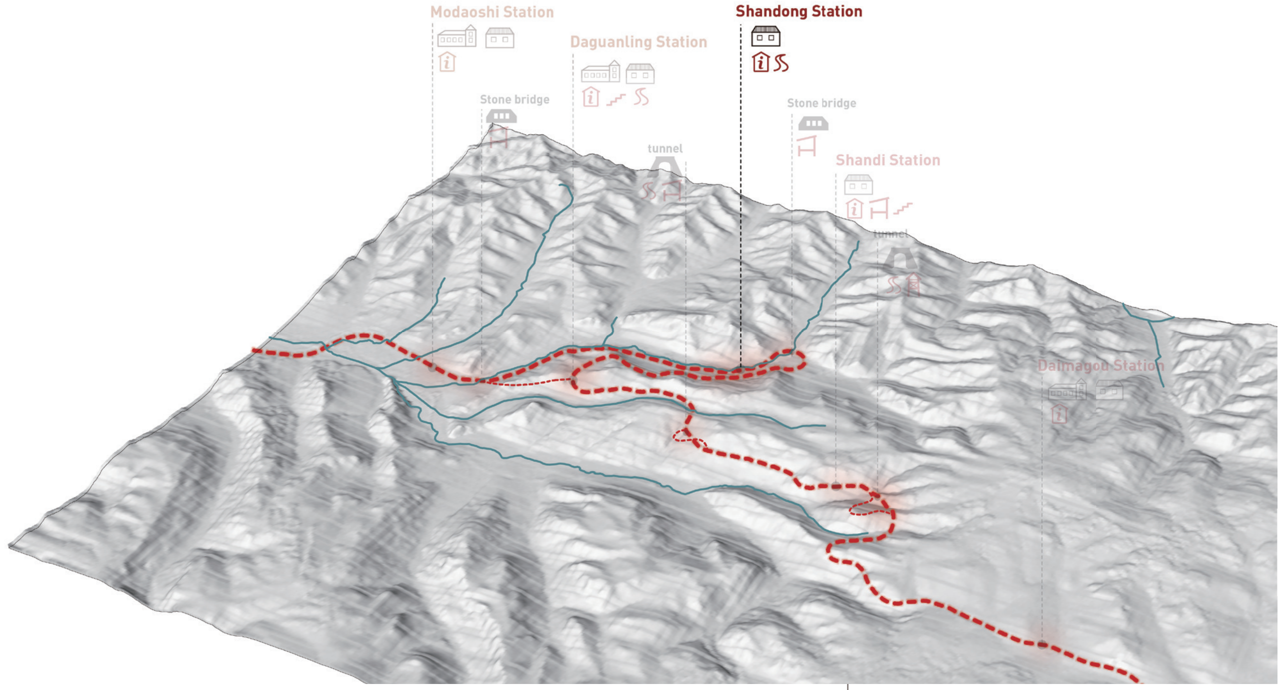


FIG. 6.40 Design plot2: A pathway/drawn by author



Single herigage building under the fast railway bridge

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6.2.6 Design site5: Daguanling Spiral Line

Attractions transformed from historic buildings/facilities

Design plot2: A pathway connecting the two levels of the railway spiral loop line

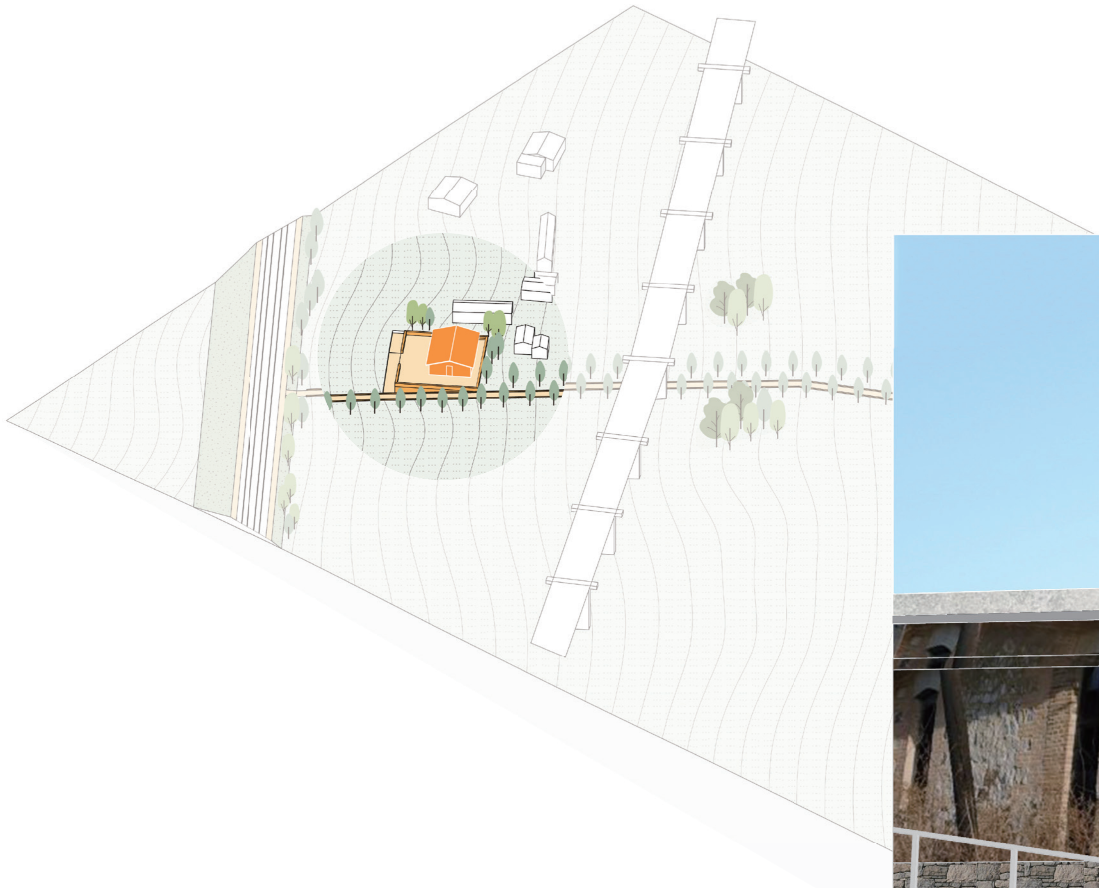


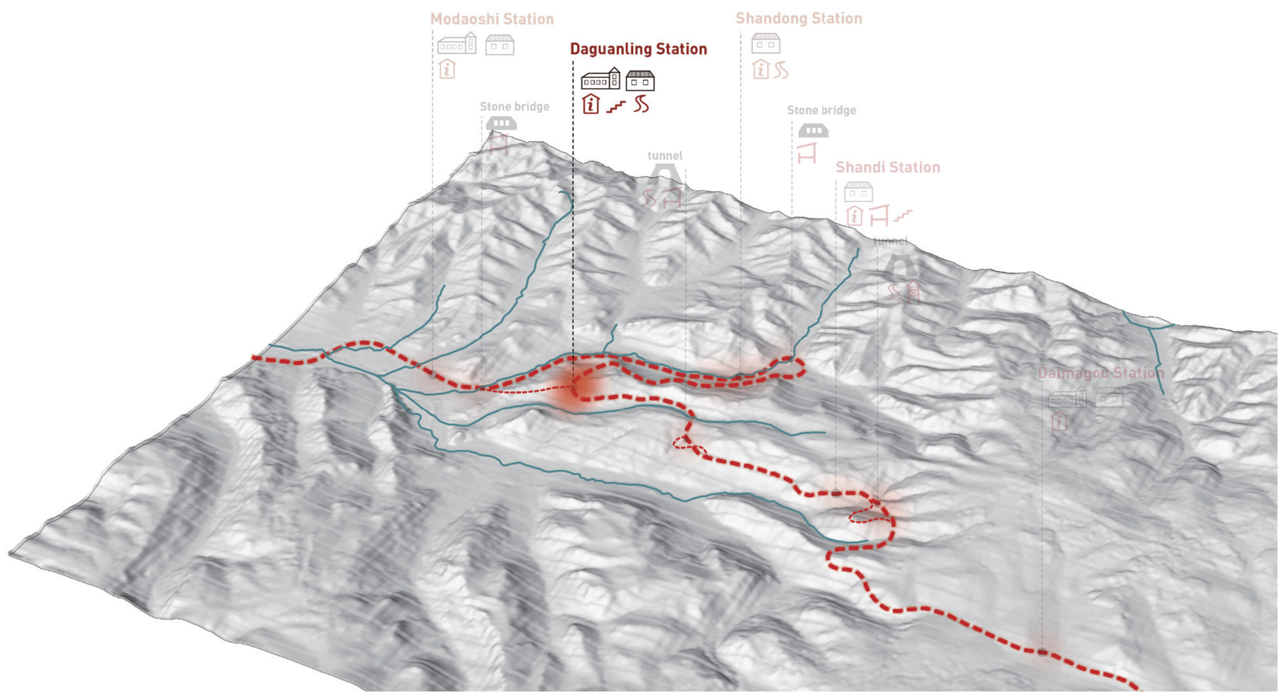
FIG. 6.41 the pathway/drawn by author

6.2.6 Design site5: Daguanling Spiral Line

Attractions transformed from historic buildings/facilities

Design plot3: a scenic pathway and a viewing terrace

The railway ascends the mountain ridge at this location, offering expansive panoramic views of mountains, villages, forests, and farmland. Therefore, a scenic pathway has been designed along the railway to provide panoramic views. Additionally, connections to various heritage buildings have been integrated along this pathway. Behind the train station, a viewing terrace has been constructed using the natural slope, allowing visitors to sit and admire the distant scenery.



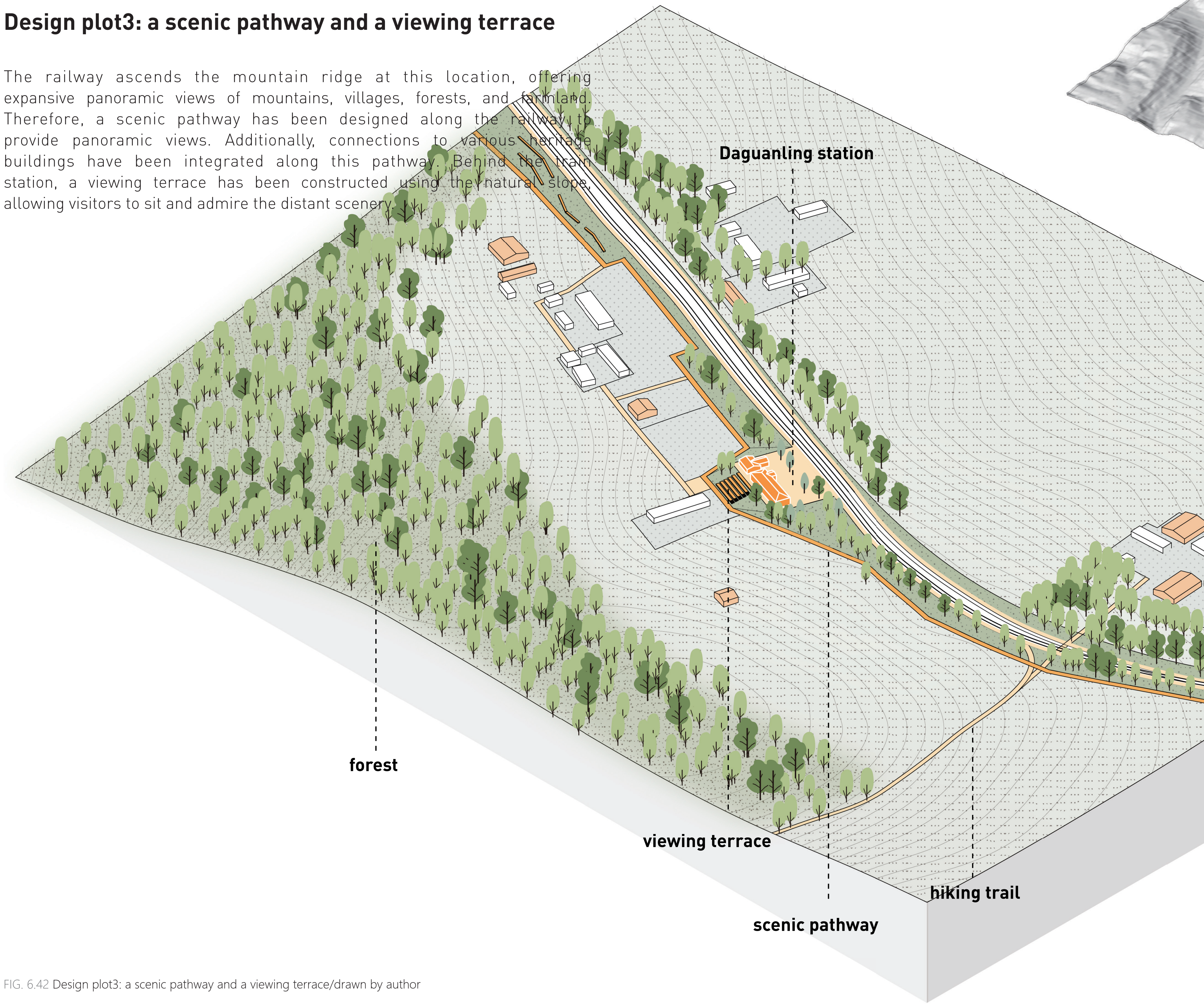


FIG. 6.42 Design plot3: a scenic pathway and a viewing terrace/drawn by author

taken by author

6.2.6 Design site5: Daguanling Spiral Line

Attractions transformed from historic buildings/facilities

Design plot3: a scenic pathway and a viewing terrace

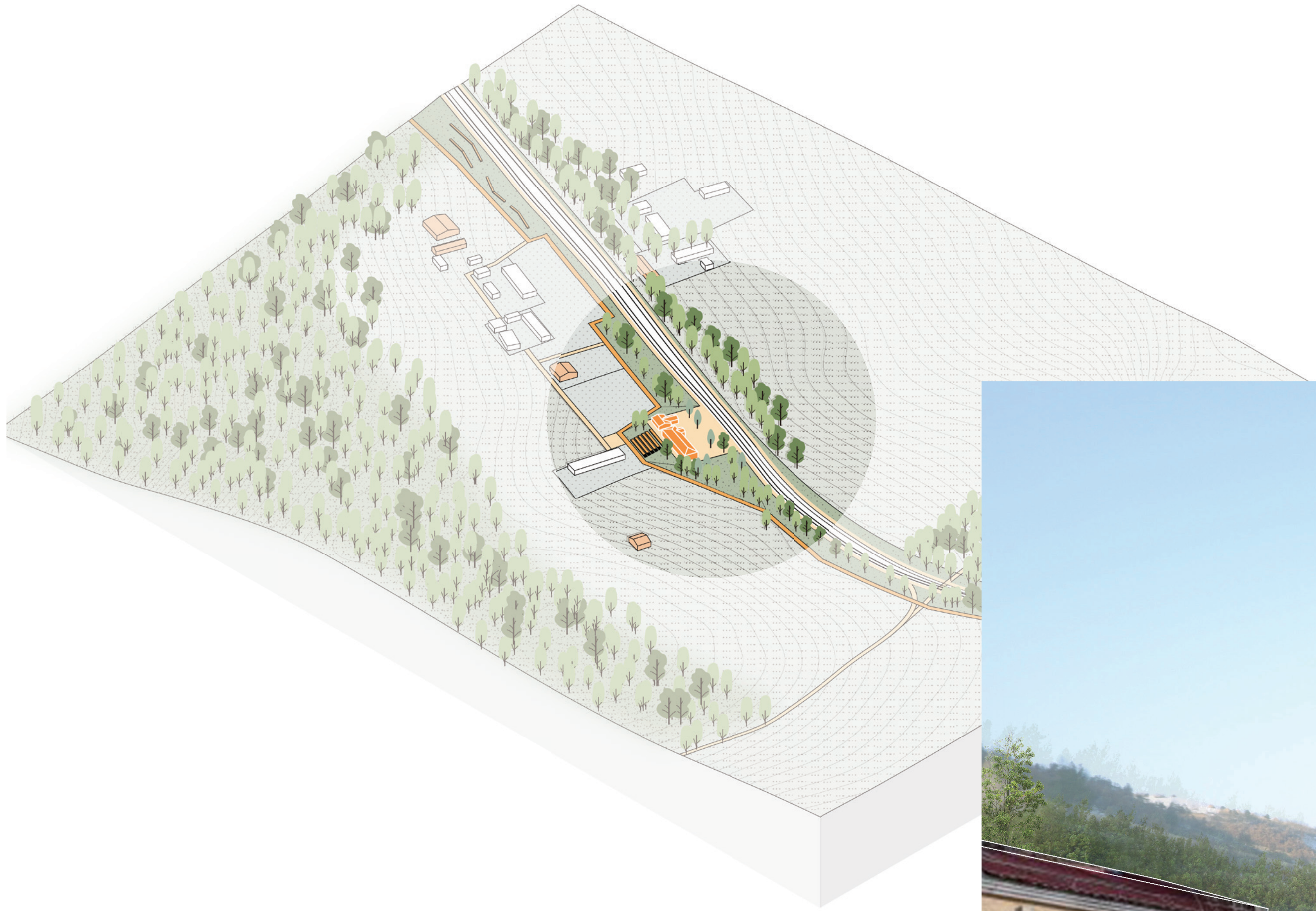
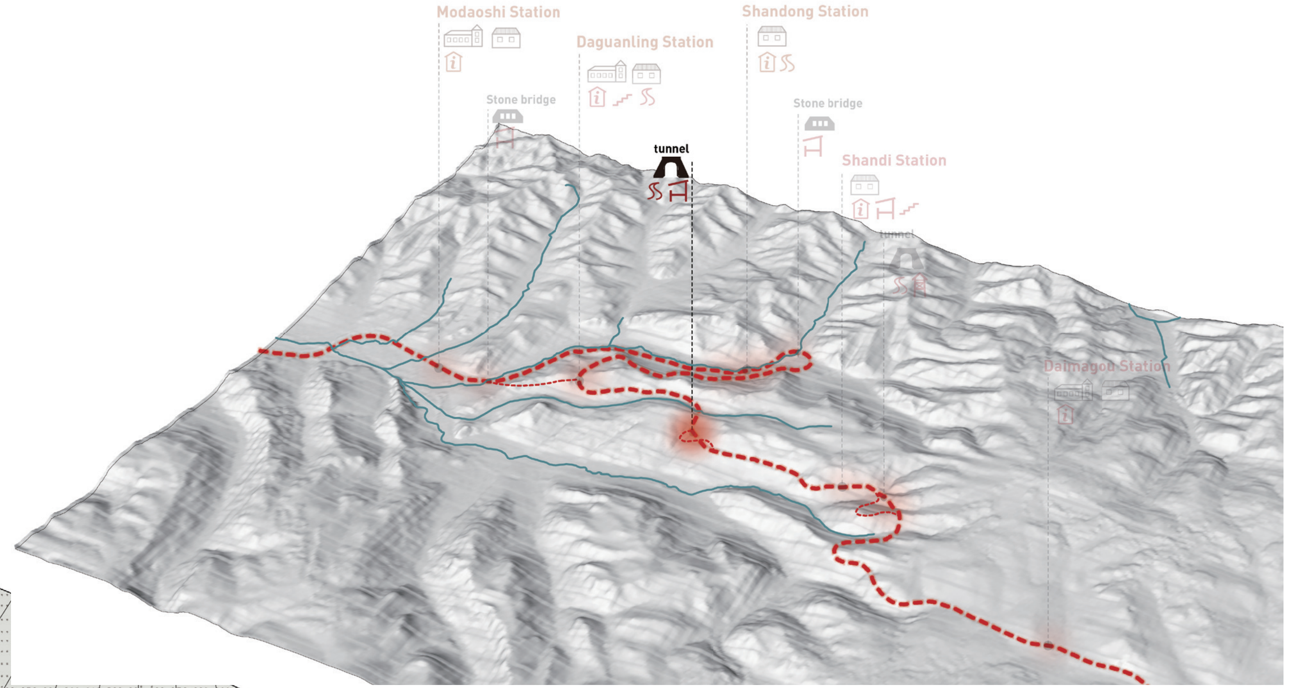


FIG. 6.43 viewing terrace/drawn by author

6.2.6 Design site5: Daguanling Spiral Line



Attractions transformed from historic buildings/facilities

Design plot4: a trail and an observation platform

The heritage facility at this location is a tunnel that passes through a small hill. The tunnel is surrounded by farmland and forests on both sides. The design includes a trail that ascends the hill, utilizing the top of the tunnel as an observation platform

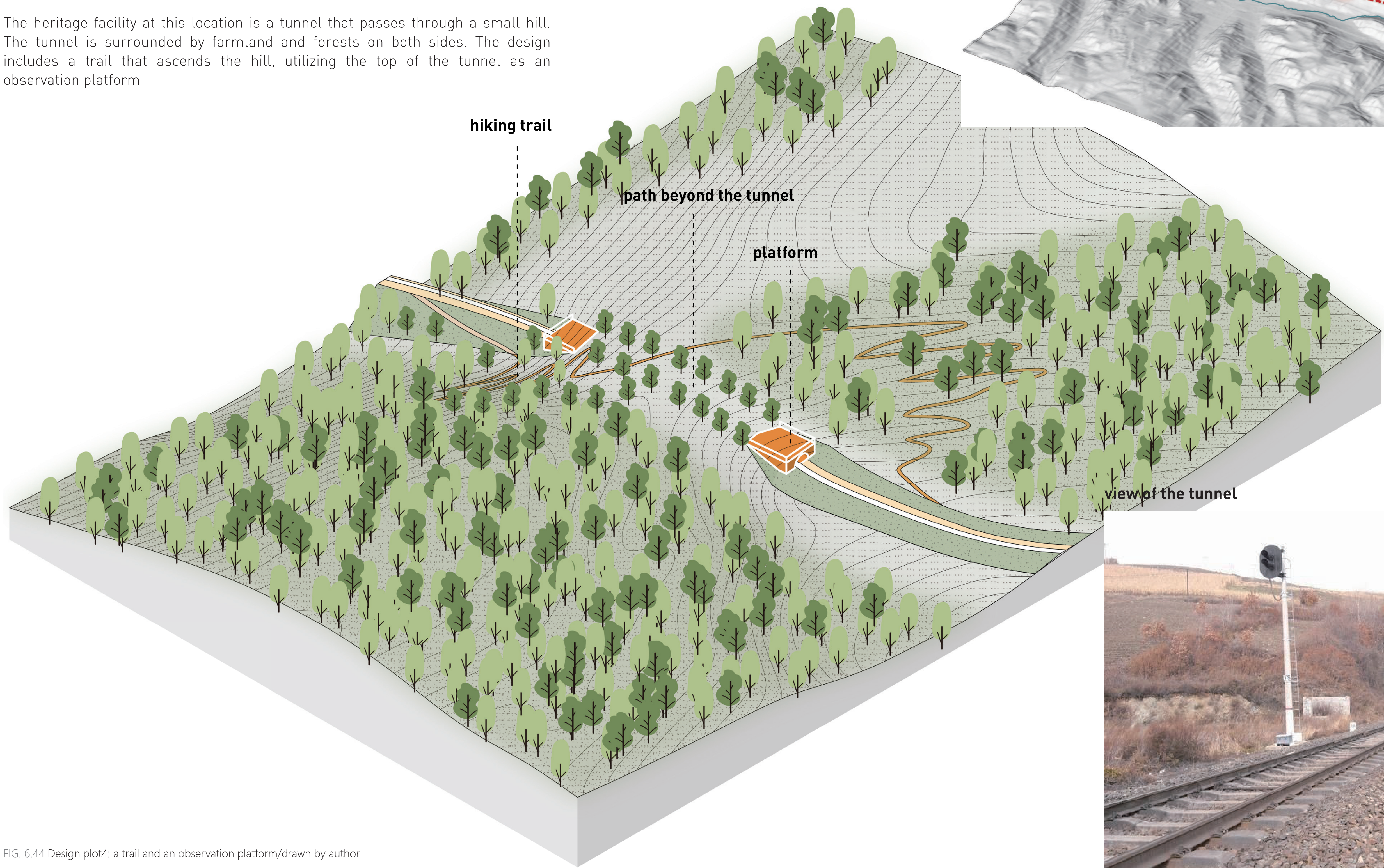


FIG. 6.44 Design plot4: a trail and an observation platform/drawn by author

view of the tunnel

https://m.8264.com/thread-1458171-1.html?utm_source=s14363562&utm_campaign=p15131331&turn=1&hasPd=159

6.2.6 Design site5: Daguanling Spiral Line

Attractions transformed from historic buildings/facilities

Design plot4: a trail and an observation platform

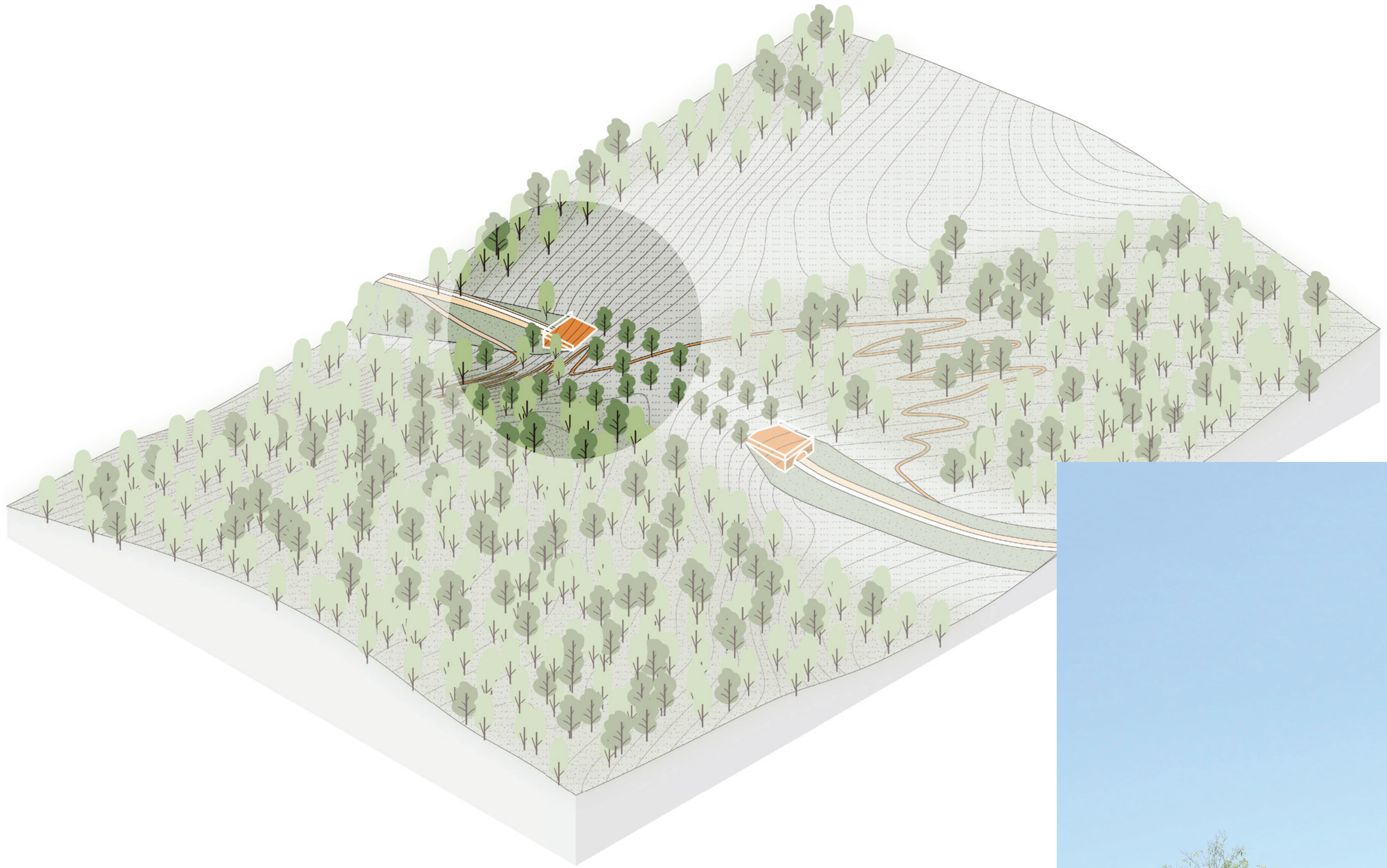
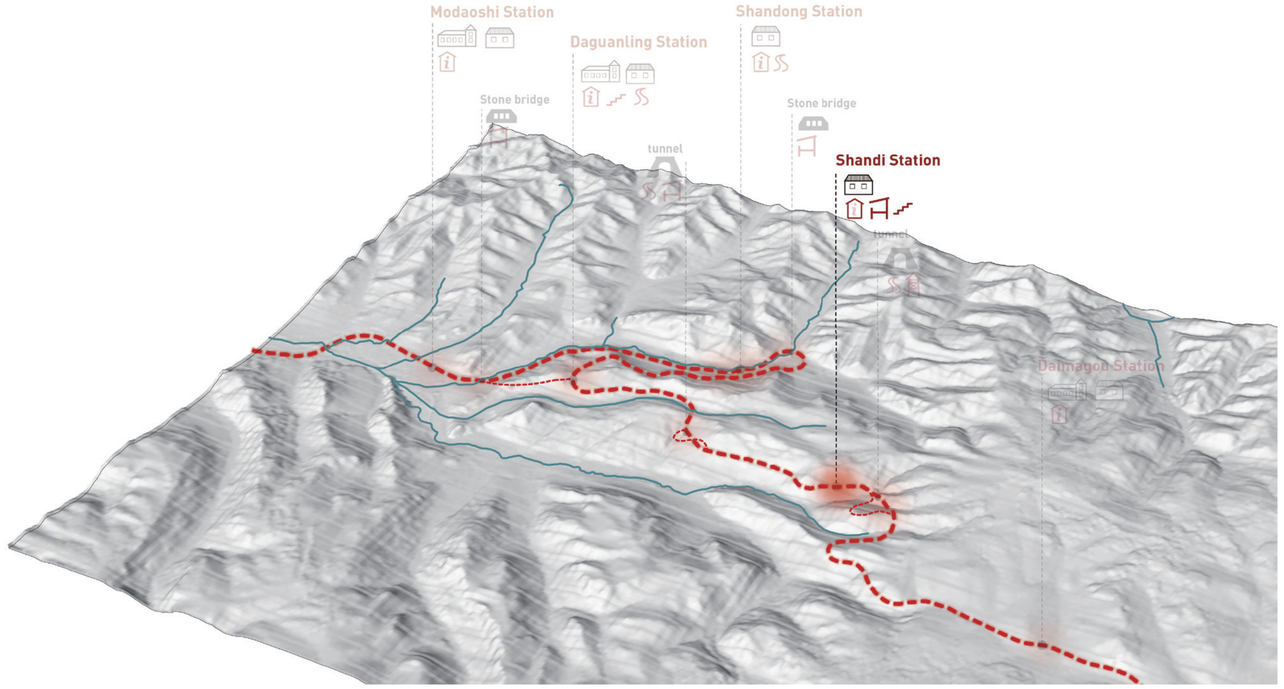


FIG. 6.45 view in front of the tunnel/drawn by author

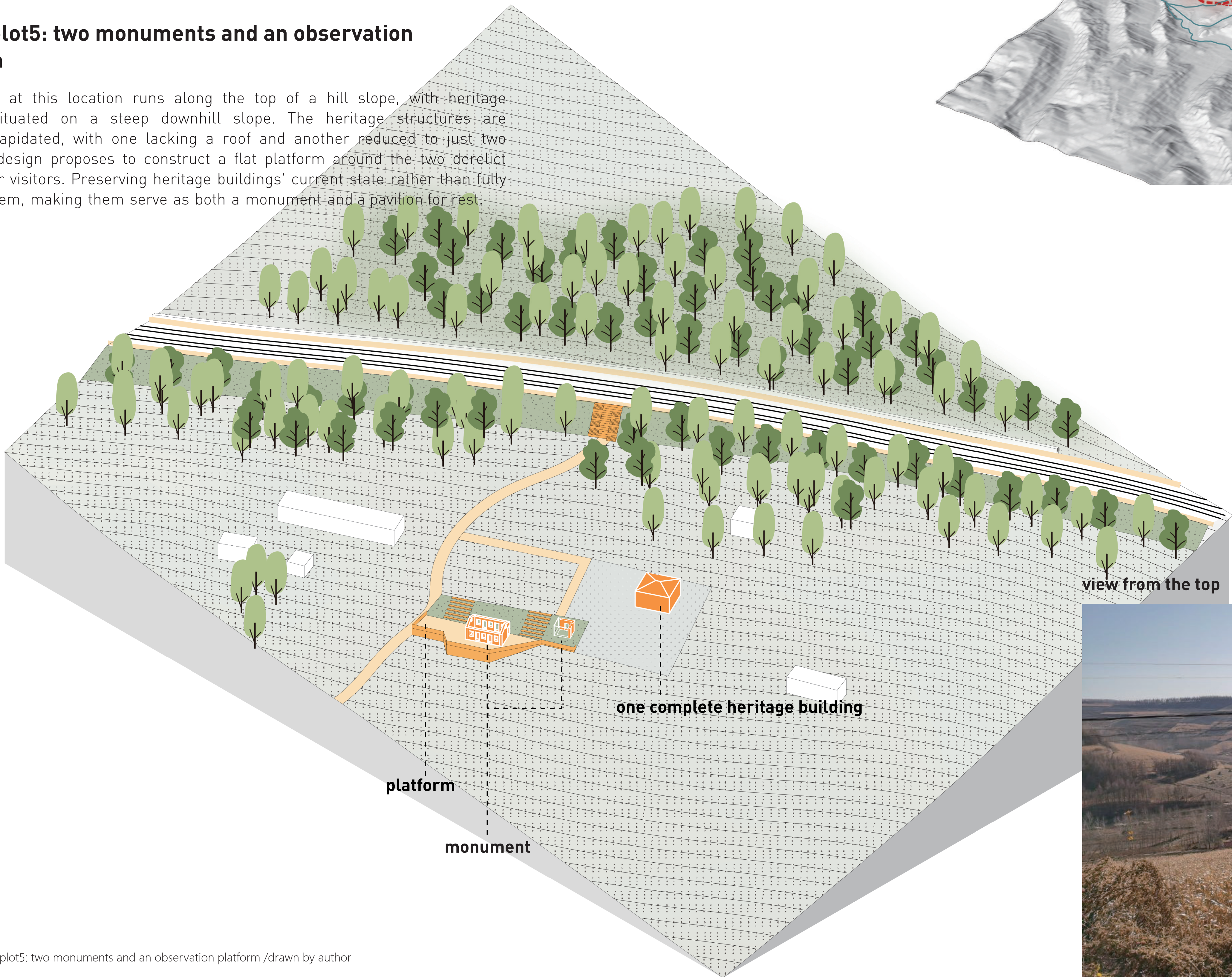
6.2.6 Design site5: Daguanling Spiral Line



Attractions transformed from historic buildings/facilities

Design plot5: two monuments and an observation platform

The railway at this location runs along the top of a hill slope, with heritage buildings situated on a steep downhill slope. The heritage structures are severely dilapidated, with one lacking a roof and another reduced to just two walls. The design proposes to construct a flat platform around the two derelict buildings for visitors. Preserving heritage buildings' current state rather than fully restoring them, making them serve as both a monument and a pavilion for rest.



view from the top

https://m.8264.com/thread-1458171-1.html?utm_source=s14363562&utm_campaign=p15131331&turn=1&hasPd=159

FIG. 6.46 Design plot5: two monuments and an observation platform /drawn by author

6.2.6 Design site5: Daguanling Spiral Line

Attractions transformed from historic buildings/facilities

Design plot5: two monuments and an observation platform

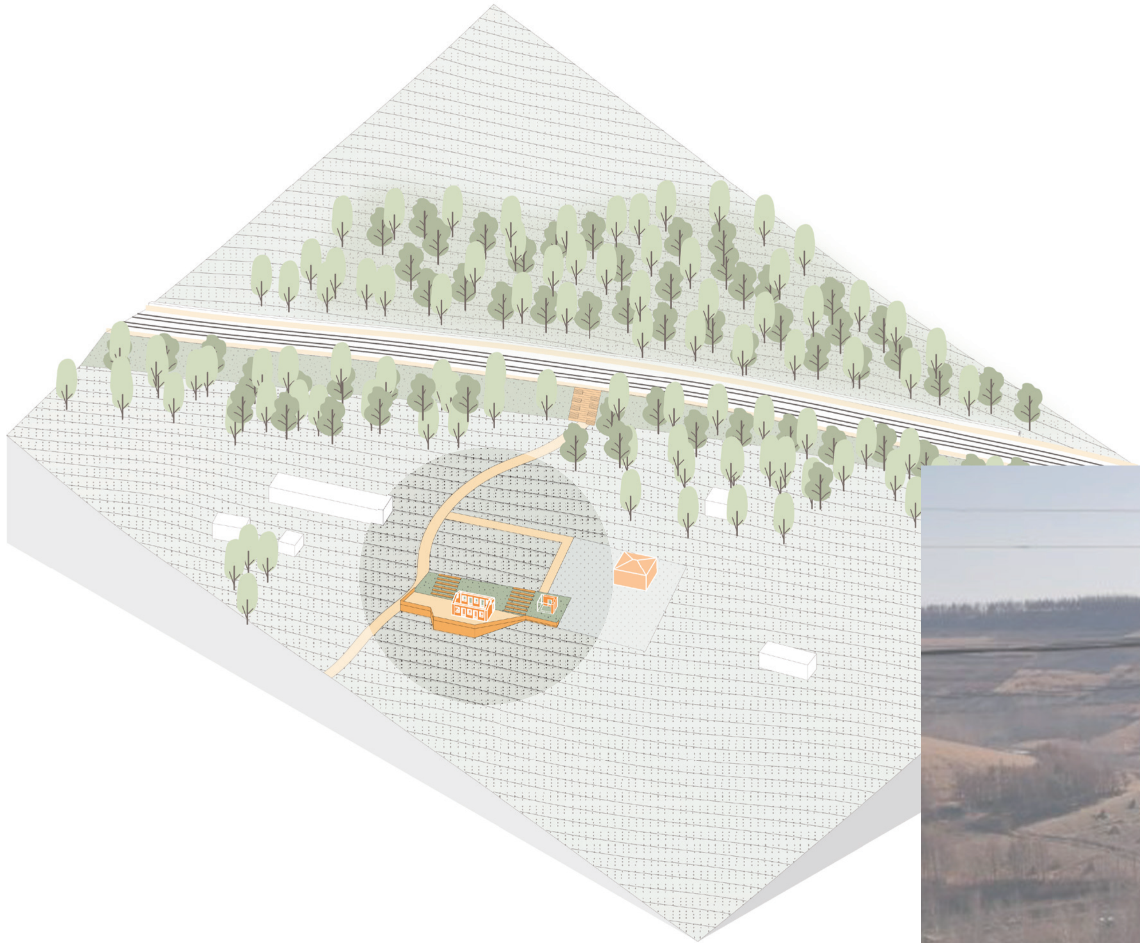


FIG. 6.47 view from the platform/taken by author

View from Daguanling station/Photo: taken by author

7. Conclusion&Reflection

Conclusion

The project starts from the current state of heritage being abandoned and neglected and identifies spatial issues from larger scales and contexts. To improve heritage conditions comprehensively from different scales, I go through a lot of heritage preservation theories. Throughout the whole theoretical research construct an understanding of the contemporary heritage preservation approaches about what to preserve and how to preserve.There is an increasing perspective among people regarding what heritage should be preserved, evolving from a focus on tangible entities to an increasing emphasis on heritage environments and the readable context of heritage, which provides more opportunities to landscape design.

Theoretical research and case studies have demonstrated the value of the preservation and development of the historic environment, offering a readable context for understanding heritage buildings, keeping historic identity within historic areas, and providing a foundation for a meaningful and high-quality urban environment. Consequently, I have briefly analyzed the landscape design aspects of the historic environment at different scales, including the natural background and infrastructure of the region, the historic townscape, and the open spaces surrounding heritage sites.

The theoretical study and case analysis above have inspired new strategies for developing CER heritage. Beginning with a 200km abandoned railway line, I conducted detailed analyses of current heritage patches and historic urban landscape patterns. Subsequently, I constructed a design framework from three scales: railway, urban, and architecture.The primary design strategy at a large scale involves leveraging heritage resources to drive tourism development. At the urban and architectural scales, heritage development is aligned with tourism needs. The goal is to integrate heritage along the route into a cohesive tourism system and revitalize the heritage corridor through the reuse of heritage resources. Considering the extensive span of the railway line and varying economic conditions across different towns, a point-axis development model is proposed as a reference. This prioritizes sites with greater economic, cultural, and transportation resources, with the scale effects ultimately diffusing to all stations.

Subsequently, specific landscape interventions are proposed based on the design strategy. In implementing the design, I first planned transportation routes and attractions for the entire railway line. I then categorized historical patches along the route into five types and selected one from each category for detailed design. Within each patch, landscape strategies were employed to reinterpret historical landscapes and heritage elements, enhancing the perception and identity of heritage sites within urban patches, which aims to elevate the functionality and aesthetic quality of heritage sites, providing improved public spaces and heritage experiences for both tourists and locals. The final design outcomes can also reflect the value of the preservation and development of the historic environment as discussed in the theoretical section.

Reflection

reflection through the relationship to Flowscapes studio

The theme of the Graduation Lab is "Flowscape," with the keyword "flow" having various interpretations. I believe a comprehensive understanding refers to a dynamic, continuous, and ongoing process. For my research project on railway cultural heritage, this flow can indicate the cultural transmission process inherent in heritage, representing the influx of other cultures into China along with railway construction and the resulting heritage as a historical testament passed down from the past to the present. It also refers to the operational railways themselves, where the routes and surrounding heritage are part of this dynamic process. Although the current phase of cultural transmission has ceased, its impact is profound, and the heritage left behind during this process forms an essential part of the historical context of towns and regions. However, as heritage faces destruction and challenges in the new era, the process of passing this historical context from the past to the present is greatly affected. The project aims to propose measures from a landscape perspective to improve existing spatial issues, thereby reasserting the presence and value of heritage and perpetuating historical memory and legacy.

reflection through the retationship to lab topic: scale continuum

The laboratory theme involves exploring four landscape design principles, with a focus on the scale continuum as the primary guiding factor. Scale is a crucial consideration in spatial design, as different scales encompass varying ranges of background information and necessitate different design approaches. From a regional perspective, strategic guidance and planning are required, while from a neighborhood perspective, sufficient detail is essential. My research subject is a complex railway heritage system characterized by long routes, extensive spans, numerous heritage sites, and diverse types. It cannot be simply understood as a collection of heritage buildings. Therefore, I employ the concept of a heritage corridor to describe this complex system and construct the heritage system in a layered manner across different scales: individual heritage sites, urban patches, and the railway scale. In problem analysis, the consideration of the scale continuum is essential, as the interconnected influences across different scales are significant for a system like the railway heritage corridor. It is normal for issues at larger scales to impact the heritage, necessitating an understanding of the current situation within the broader context and identifying causes from various scales. Finally, in the design phase, I apply the same approach, proposing solutions to problems at different scales in a layered manner. This ensures that the overall issues are addressed comprehensively, rather than solving just one aspect.

reflection through the relationship between research and design

The initial fascination for this project stemmed from an interest in abandoned railway heritage, curiosity about the reasons behind its poor preservation status, and the landscape potential perceived in the surrounding neglected green spaces of derelict railways and heritage sites. The research began with a literature review, where I explored numerous documents and atlases on railway history, as well as studies on CER cultural heritage, including heritage value assessment, types of heritage buildings, technology, and the urban morphology of towns along the railway. This provided me with a comprehensive understanding of the entire railway heritage system.

At the outset, while analyzing issues and proposing suggestions, I believed that the heritage's surrounding urban environment was crucial, focusing primarily on the town level. However, during field investigations, I realized that broader scale issues significantly impact smaller scales. For example, the accessibility of these heritage sites: many historical stations along the railway are difficult to reach without a car due to the discontinuation of railways, exacerbating the abandonment and neglect of the heritage. Consequently, I started examining the structure of the entire railway corridor, from the scale of the railway itself to the scale of individual buildings, organizing identified issues according to different scales.

Field research further deepened my understanding of the site, allowing me to experience the landscape atmosphere firsthand and gather valuable insights through interactions with local residents. The theoretical framework played a crucial role throughout, guiding both my research and design development. Early on, theories such as Historic Urban Landscape and Heritage Corridor helped me interpret the heritage system and analyze problems.

My research and design process was non-linear: desk research identified issues and built the theoretical framework; fieldwork and theoretical feedback refined the research; theoretical guidance led to design strategies; and design testing aimed to solve the issues raised by the research, with continual feedback loops refining both research and design.

Reflection

reflection through project results

This project treats the overall spatial structure beyond the heritage itself as the landscape context. The aim is to enhance the accessibility, functionality, and aesthetic quality of the surrounding environment around heritage sites, making railway heritage more perceptible, visitable, and attractive to the public. By preserving and developing the historic environment, the project seeks to reveal the historical and economic value of the heritage and revitalize the railway heritage.

During the design testing phase, a disused railway section traversing a hilly area was selected for tourism planning and related infrastructure development. Five representative heritage sites were chosen for environmental and public space enhancements. From a macro perspective, the test railway segment serves as a microcosm of the entire heritage corridor. The goal is to use this segment as an exemplar, applying these interventions to other disused railway sections and gradually expanding to the entire corridor.

In a broader sense, this project fosters a new understanding of the development of historical and cultural heritage. As stated in the Historic Urban Landscape approach, the focus is on the wider natural and urban environment. Heritage should not be isolated from urban and social development but needs to be integrated into the spatial structure, reintegrated into the mainstream, and incorporated into people's daily lives.

limitation of the project

The primary challenge with this project lies in the vast scale and scope, encompassing over 2,000 heritage sites and more than 100 heritage clusters. Consequently, the research and analysis may not provide a detailed examination of every cluster, resulting in somewhat broad qualitative analyses. Additionally, due to the large area and limited fieldwork time, only a few heritage clusters were visited, leading to the collection of less specific and not enough information on heritage buildings. The winter season also restricted the ability to experience the spring and autumn landscapes of the heritage sites. Much of the data relied on existing research papers, reports from railway enthusiasts, and photographs, some of which may be outdated and not reflective of the current state.

Moreover, to highlight the value of preserving and developing the historic environment, the design phase emphasizes landscape design for open spaces. However, from a more comprehensive perspective, public space planning is only one part of heritage planning. Therefore, the design may appear somewhat idealistic and biased.

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