



Analysis and Optimization of Spatial Design of Industrial Heritage-Based Creative Industrial Park Based on Environmental Behavior

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Abstract. In the renewal process of old industrial cities, the transformation and reuse of industrial heritage has become a hot issue. However, the existing design of old industrial buildings is generally more concerned about the material function, and the design for the psychological needs of users is not sufficiently considered. Therefore, based on the theory of environmental behaviour and the case of Shenyang Hongmei Cultural and Creative Park, this paper identifies the psychological factors of environmental behaviour in the spatial design of industrial heritage-type creative industrial parks, analyses and summarizes the design methods, and proposes design strategies to enhance the cultural attributes of spatial design, spatial accessibility, scale appropriateness, and social interaction, in order to provide references for the innovative reuse of industrial heritage.

Keywords: Industrial Heritage; Creative Industrial Parks; Environmental Behavior; Urban Renewal; Spatial Design

1 Introduction

As a carrier of urban memory, the reuse of industrial heritage is not only the transformation of space, but also the inheritance of history and culture. However, most of the current cases focus on functional requirements, and lack consideration of cultural and emotional space needs.^[1] However, the vast majority of current transformation cases are more concerned with functional and materialistic needs, and lack consideration for cultural and emotional space needs^[2].

Environmental behavior studies human-environment interactions, offering theoretical frameworks and design insights for architectural spaces. Focusing on the human perspective, it explores how spatial perception and usage influence behavior and emotions. The physical environment shapes individual perception, cognition, and actions, while human behavior conversely impacts environmental dynamics.^[3] This paper discusses the application of environmental behavioral science in the transformation of industrial heritage into creative industrial parks, and takes Shenyang Hongmei Cul-

tural and Creative Park as an example to verify the feasibility of the relevant design strategies.

2 Analysis of the Correlation Between Spatial Design of Industrial Heritage-Based Creative Industrial Parks and Environmental Behavioral Theory

2.1 Spatial Design Strategies for Industrial Heritage-based Creative Industrial Parks

Industrial architectural heritage is a collective term for buildings and structures constructed for industrial activities and the environment and landscape in which they are situated, and is a reminder and symbol of the past industrial era, with historical, technological, social and architectural values^[4]. Many industrial heritages have lost their original functions. To preserve industrial heritage and its historical significance, government policies now promote its adaptive reuse. As highlighted by Guangming Daily's analysis of 143 Chinese cases, cultural industries dominate industrial heritage revitalization. This paper focuses on designing creative industrial parks through the adaptive reuse of obsolete industrial sites.

When designing industrial heritage-based creative parks, preservation must balance innovation. As architect John Portman noted, architecture should serve people through inclusive, diverse spaces. The strategy centers on creating multifunctional environments for varied users. This study applies environmental behavior theory to industrial heritage revitalization, guiding the creation of spaces that honor history while addressing contemporary needs.

2.2 Explanation of Core Concepts in Environmental Behavior

Environmental behavior studies the dynamic interplay between humans and their surroundings, examining how physical, cultural, and social environments shape cognition, behavior, and well-being, while also exploring how individuals perceive, adapt to, and transform spaces. Core principles—such as environmental perception, spatial cognition, privacy, walkability, and post-occupancy evaluation—provide critical insights for revitalizing industrial heritage. As seen in China's cultural industry-driven transformation of 143 industrial sites (Guangming Daily), adaptive reuse must balance historical preservation with modern innovation. Architects like John Portman emphasize human-centered design, advocating for inclusive, multifunctional spaces that honor industrial legacy while fostering community engagement, health, and sustainability. By integrating environmental behavior theory, such projects bridge historical continuity with contemporary needs, ensuring revitalized spaces resonate both functionally and emotionally with diverse users.

2.3 Theoretical Refinement of Spatial Design for Industrial Parks from the Perspective of Environmental Behavioral Science

The key theoretical elements, design principles and strategies used in the spatial design of industrial heritage creative industrial parks are constructed through the above theoretical research, as shown in Table 1.

Table 1. Refinement of theories related to environmental behavior and spatial design of industrial heritage-type creative industrial parks.

doctrinal	thrust	distill and inspire
environmental perception theory	Multi-sensory information integration	Optimising the efficiency of information transfer and perception
Spatial Cognition Theory	Mechanisms of spatial information perception	Enhanced spatial orientation and identification
Walking Behavior and the Environment	Walking behaviour and path selection patterns	Designing Diverse Paths of Inquiry
Privacy and domain	Hierarchy of public spaces	Balancing the need for openness and privacy

2.4 The Significance of Environmental Behavioral Science in Guiding the Spatial Design of Industrial Parks

(1)Environmental behavior theory improves park accessibility and utilization by applying spatial cognition principles to optimize walking paths, signage, and multifunctional public spaces. Designs should preserve large-scale industrial features while integrating human-scale flow lines, flexible layouts, and modular elements for adaptability. For instance, Shanghai's Sanxiuqiao Nippon Park enhanced interconnectivity and accessibility through strategic grey-space design and strengthened edge-space connections, demonstrating how thoughtful planning bridges historical structures with modern usability.^[5]

(2)Environmental behavior theory underscores the importance of spatial scale and hierarchy in shaping user experience. Rationalizing spatial dimensions in creative industrial parks promotes balanced social interaction and privacy, while layered layouts enhance way finding and exploration. For example, Nanjing's 1865 Creative Industrial Park (originally Jinling Machine Manufacturing Bureau) strategically zones spaces by terrain, blending communal areas with private domains to cater to diverse user needs.^[6]

(3)Promoting public participation in planning and design Environmental Behavioral Studies advocates a human-centered design philosophy, emphasizing the key role of public participation in the spatial design process. By conducting workshops, questionnaires, public consultations and other forms of participation, potential users and community residents are involved in the planning, needs and ideas are collected, and people's sense of belonging to the park and their sense of responsibility are enhanced. Public participation also facilitates communication between designers and users to

ensure that the design outcomes are more in line with actual needs, and to enhance design effectiveness and user satisfaction. Post-use evaluation assesses the actual performance and effectiveness of a building or space to meet user needs. For example, the planning and design of the public space on the east bank of the Huangpu River in Shanghai collected suggestions from the public on public transportation, slow-moving systems, and public space through online questionnaires and community interviews, which guided the design and improved the accessibility and utility of the space^[7].

3 Spatial Design Methods for Industrial Heritage-based Creative Industrial Parks Based on Environmental Behavioral Sciences

3.1 Cultural Continuity and Community Interaction

The design of industrial heritage-based creative industrial parks needs to emphasize the continuation of the site's historical lineage and the enhancement of public participation^[8]. The design retains the essence of the industrial heritage and continues the cultural lineage, while setting up open public spaces to stimulate the vitality of the community, so that the renovated industrial park can assume certain social functions. The public's needs can be understood through questionnaires and other means, and through public art and interactive activities, the park can become a meeting point between history and modern life, deepening people's emotions towards their homeland, while injecting new social meanings and innovative impetus into the industrial heritage.

In the design, the protection of historical elements should be emphasized in order to achieve the continuation of the historical lineage. Old factory equipment can be utilized as art installations, which not only preserves the physical memory of the industrial heritage, but also gives it new cultural significance. In terms of community interaction, residents are encouraged to participate in the design and activities of the park through questionnaires and public art projects, the opinions of the public are listened to, and themed bazaars are organized on a regular basis so that the park can become a gathering place for community cultural activities.

3.2 Sensory Enhancement and Environmental Navigation

The spatial design of the industrial park should be centered on human perceptual experience, integrating visual and auditory sensory elements to optimize the transmission and reception of spatial information. Effective environmental cues and landmarks can help users quickly familiarize themselves with the spatial structure and form an intuitive spatial cognition of the industrial park. Designers can enhance the perceivability and comprehensibility of the space through clear guidance systems, clear layouts and fascinating environmental details.

The ecological perceptual theory of environmental behavior emphasizes that perception is the process of engaging with the external world and directly influencing

stimuli. In this regard, multi-sensory experiences should be created in the design of the park to fulfill the environmental preferences of the users. For example, water features and vegetation should be arranged to enhance auditory perception, and natural materials should be used to enhance tactile experience. At the same time, a clear navigation system should be designed, such as a special landscape at the entrance of the park as a visual focus to guide visitors to explore in depth, and a clearly labeled guide map should be set up in a conspicuous position. The spatial layout of the park should be "spacious and organized" in order to enhance user enjoyment.

3.3 Walking Experience and Trail Exploration

Path design should be centered on the user's walking experience, taking into account walking preferences, safety and the desire to explore, and be designed to create a walking environment that is both comfortable and safe, encouraging users to freely choose their paths and explore the space. Path planning should skillfully integrate features of the industrial heritage, such as old machinery and building structures, so that users can experience the cultural depth of the park as they walk through it.

Creating pedestrian-friendly trail designs should ensure that trails are spacious, flat, straight and equipped with appropriate lighting and rest areas, and facilities can be utilized appropriately for trail guidance. For example, theme trails can be developed along old railroad lines to provide a safe walking experience. Diversified exploratory paths can also be planned in conjunction with industrial heritage features, such as utilizing old machinery display areas as educational and interactive points on the paths to enable users to choose suitable walking paths according to their own preferences. For special groups such as the elderly and the visually and hearing impaired, barrier-free flow lines and signage systems consistent with the main flow lines should be installed.

3.4 Creating a Sense of Spatial Hierarchy and Territory

In the spatial design of industrial parks, the comprehensive needs of privacy, domain and personal space should be taken into account to create a multifunctional and layered spatial environment. Designers can make use of measures such as "room within a room" and "local addition" to divide and reorganize large-scaled spaces into small-scaled spaces adapted to various scales^[9]. Utilizing design elements such as greenery, partitions and furniture, we adjust the internal planning and functional layout to delineate areas with different private densities to meet the diversified needs ranging from public activities to personal work to private exchanges.

Multi-functional spaces are designed to meet the needs of different users for privacy. For example, in an industrial park converted from an old factory building, the designer can retain some of the original industrial structures such as exposed brick walls and steel beams as the signature features of the space. Between these structures, the installation of green walls, art installations or special furniture can not only divide different private density zones, but also enhance the identity and sense of belonging of the space.

4 Analysis and Optimization of Shenyang Hongmei Cultural and Creative Park

4.1 Contexts

Shenyang Hongmei Cultural and Creative Park, located in the core area of China's old industrial base in northeast China, was formerly the Shenyang Hongmei MSG Factory, is a model of transformation of industrial heritage into a creative industrial park, and the before-and-after comparison of the transformation is shown in Figure 1. Its design not only protects the historical value of the industrial heritage, but also realizes the functional transformation and the recreation of cultural value through innovative spatial design.



Fig. 1. Comparison of top view of Hongmei Wenchuang Park before and after renovation(Self-drawn).

4.2 Design Strategy and Implementation

4.2.1 Continuity and Innovation of Historical Lineage.The core strategy of the design of Shenyang Hongmei Cultural and Creative Park is the protection and reuse of historical elements. In the original production line of the factory, the raw materials were transported from the railroad tracks, unloaded at the platform to the raw material warehouse, sampled and tested at the research institute, fermented at the fermentation field, and finally purified at the purification workshop. The renovation design preserves this streamline while implanting new functions, skillfully realizing the continuity and innovation of the cultural lineage: the raw material warehouse in Building 1 is transformed into a large-scale performance venue of live house level, attracting the new cultural power; the Research Institute in Building 2 is transformed into the Qingmei Wine Shop, and the original wooden tower inside is transformed into a steel structure and glass tower, forming a landmark ; the fermentation plant of the MSG factory in Building 16 is transformed into a new building. fermentation plant of the MSG factory was transformed into the Fermentation Art Center, preserving the fermentation tanks and transforming them into unique art installations; the smaller production rooms of Building 12 were transformed into a children's playground to attract

children to play. On the basis of preserving the original site, the designers started from the spatial form of the building and completed the replacement of building functions, which not only preserved the original appearance of the industrial buildings, but also enhanced the public attributes of the park, gave it new cultural and commercial value, and attracted more people to converge here.

The landscape design of the park skillfully blends history and modernity. The designers retained elements such as fermentation tanks, pipes, railroad tracks and original greenery (Figure. 2), which not only carry the memories of the past, but also add a sense of historical weight to the park. At the same time, the walls and roads of the park are paved with red bricks, which not only retains the traditional style but also meets the needs of modern use, forming a unique and unified landscape style.



Fig. 2. Retained fermenter, pipe, green plant(self-timer).

4.2.2 Spatial perception and environmental guidance. The design of the park focuses on the optimization of spatial perception and enhances the spatial experience of visitors through a reasonable spatial layout and environmental guidance system. In terms of spatial layout, the design follows the layout of "open-private-open", the overall flow line coincides with the production flow line, and landmarks are set up in the important spaces of the park, which help visitors quickly familiarize themselves with the spatial structure of the park; in terms of the design of the visual guide, the designers adopt clear signs and panoramic maps, combined with artistic signage, which facilitate visitors' navigation and add an artistic atmosphere to the park. In the design of the visual guide, the designer adopts clear signs and panoramic maps, combined with artistic signage, to facilitate the navigation of visitors and at the same time add artistic atmosphere to the park. The maps are distributed at all entrances and public spaces, clearly labeling the distribution of the park's businesses and the location of each service implementation. The panoramic map is a bird's-eye view of the park with realistic architectural forms, which helps visitors to quickly confirm the location. In terms of environmental guidance, the park uses greening, water features, light and shadow, and site height difference design, which not only skillfully divides the space and forms a prominent landmark in the park, but also enriches the multi-sensory experience of the visitors, which helps to adapt to the environmental preferences of different tourists and enhances the sense of enjoyment in the park. The internal guidance system of the park is shown in Figure 3.



Fig. 3. The guidance system inside the park(self-timer).

4.2.3 Walking paths and spatial accessibility. The design of the walking path emphasizes comfort and accessibility. The plazas and paths in the park are naturally formed through the enclosure of the buildings and are spacious and flat, with no obvious steps. Resting areas and landscape nodes are set up along the paths to guide the flow of visitors through different ground materials, plant configurations and art installations. The design of the interior pathways emphasizes spatial accessibility and visibility, helping to minimize the sense of disorientation of the viewer in the midst of the movement^[10].or example, the children's playground retains the change in floor height of the interior space, and the functional space is arranged floor by floor with the change in floor height.The walking route moves from dynamic to static, forming a progressive flow full of logic and exploratory flavor. The barrier-free design of the park takes into account the needs of different user groups, with steps and ramps rationally arranged to ensure easy access and use by visitors.

In order to verify the effect of the retrofit, spatial syntax analysis of the park space was performed using Depthmap software. The CAD model before transformation was translated into a convex spatial model for computational analysis. By comparing and analyzing the data of integration and selectivity indicators of Hongmei Cultural and Creative Park before and after the transformation, we analyze whether the accessibility of the park is improved after the transformation of Hongmei MSG Factory into a cultural and creative park.

Integration is a measure of the standardized distance from any point in space to any other point, reflecting the accessibility and familiarity of the space. In the software, the warmer the color displayed, the higher the integration degree of the area. As shown in Figure 4, before the renovation, the Hongmei MSG factory park was densely built and spatially complex, with an average distribution of integration degree and a lack of clear distinction between public and private spaces; after the renovation, the park reduced the number of buildings, preserved the characteristic historical buildings and replaced the functions. Nowadays, the main east-west and north-south roads and neighboring buildings in the park are more integrated, which helps to gather people flow and generate economic and social benefits. The integration degree of Hongmei Cultural and Creative Park has increased from 0.91 to 1.25 after the renovation, showing that the spatial layout has been effectively improved. At the same time, the selectivity data shows that the attractiveness of the main paths has increased, confirming the effectiveness of the design in optimising spatial accessibility and economic vitality. As shown in Figure 5, the internal space of the park before the renovation is generally less connected, with fewer areas of high pedestrian flow, and most of the space is in an “isolated” state. After the renovation, the overall connectivity of the park has increased, and spaces such as the entrance plaza, the plaza in front of the commercial space, and the road in front of the Hongmei Times Square all show higher connectivity, which can effectively attract people and form a gathering effect. Specific data are shown in Figure 6.

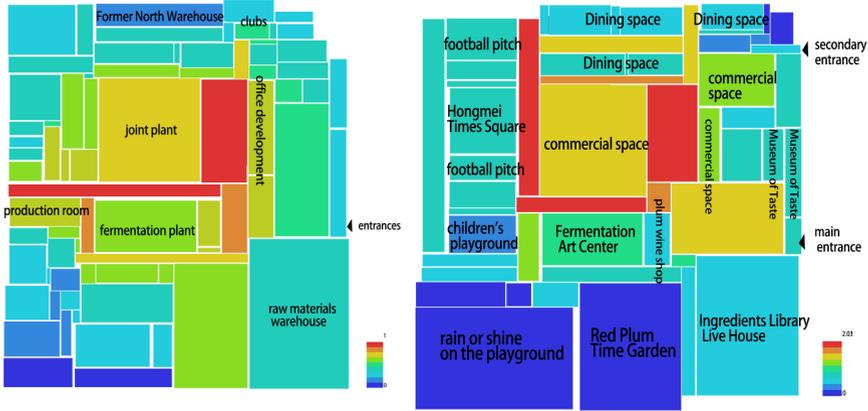


Fig. 4. Comparison of integration before and after the renovation (self-illustration).

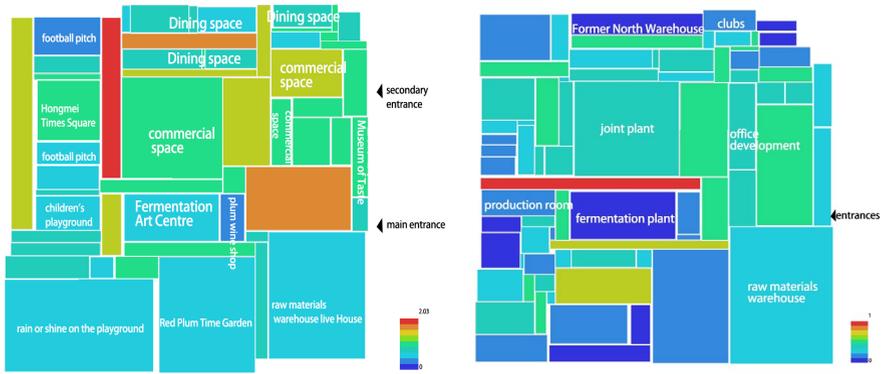


Fig. 5. Comparison of connectivity before and after the renovation (self-illustration).

Ref	Choice	Connectivity	Integration [80]	Mean Depth	Relativised Entropy
0		-1	0	-1	-1
1	0	2	1.1745583	3.8113208	2.1081138
2	1	3	1.1824945	3.7924528	2.0925666
3	1	2	0.9669016	4.4150944	2.1743407
4	312	6	1.5487539	3.1320755	1.7246617
5	17	4	1.2774394	3.5849056	2.0938604
6	42	4	1.2774394	3.5849056	2.0938604
7	0	2	1.1590012	3.8490567	2.3181362
8	0	2	1.335948	3.471698	2.0098524
9	0	1	1.198693	3.7547169	2.4034781
10	5	2	0.86638212	4.8113208	2.4362388
11	0	2	0.94599563	4.4905663	2.3200769
12	14	4	1.3158586	3.509434	2.0602851
13	0	2	1.2500657	3.6415095	2.1644912
14	27	2	1.2963644	3.5471699	2.1103644
15	0	1	1.2238405	3.6981132	2.2195237
16	31	3	1.3060387	3.528302	2.0795393
17	2	3	1.3060387	3.528302	1.9708375
18	2	3	1.3060387	3.528302	1.9708375
19	65	3	1.198693	3.7547169	1.9882522
20	9	3	0.88388479	4.7358489	2.3208194
21	74	5	1.2238405	3.6981132	1.9575927
22	159	5	1.1513762	3.8679245	2.0106995
23	25	4	1.1745583	3.8113208	2.0157545
24	30	4	1.2324591	3.6792452	2.1832159
25	88	4	1.7500919	2.8867924	1.7647767
26	56	5	1.5086999	3.1886792	1.8278035
27	646	9	1.7500919	2.8867924	1.8755574
28	4	3	1.20696	3.7358491	2.2071347
29	334	7	1.8818192	2.7547169	1.676268
30	570	7	2.0349905	2.6226416	1.609777
31	398	5	1.8618	2.7735848	1.8639044
32	695	5	1.923178	2.7169812	1.7198114
33	887	10	1.923178	2.7169812	1.7197286
34	811	9	1.7858081	2.8490567	1.6668527
35	604	6	1.7327642	2.9056604	1.6681637
36	278	5	1.3060387	3.528302	1.9338741
37	276	3	1.3672593	3.4150944	2.0574288
38	33	3	1.1076531	3.981132	2.2348778
39	570	7	1.4706655	3.2452831	1.8042723
40	4	2	1.0671293	4.0943398	2.1552422
41	52	3	1.3060387	3.528302	2.0451732
42	97	3	1.0870136	4.0377359	2.12079
43	6	2	0.86638212	4.8113208	2.4362388
44	199	4	1.1438509	3.8867924	2.1199114
45	12	3	0.84139031	4.9245281	2.4405427
46	68	3	1.1147082	3.9622641	2.1261277
47	0	3	1.1824945	3.7924528	2.0925666
48	1	4	1.3158586	3.509434	1.9545579
49	165	5	1.2238405	3.6981132	1.9578731
50	16	4	0.977705	4.3773584	2.1664581
51	18	4	0.93587804	4.5283017	2.2881262
52	0	2	1.1745583	3.8113208	2.1081138
53	4	4	1.3158586	3.509434	2.0602851
54	104	6	1.2153416	3.7169812	2.0013213
			1.257849287		

Ref	Choice	Connectivity	Integration [HH]	Mean Depth	Relativised Entropy
0	48	3	0.75302718	5.9452057	2.0310172
1	112	4	0.96474999	4.8630137	2.3085074
2	322	4	1.193243	4.1232877	2.0567575
3	631	4	1.3740374	3.7123287	1.9370215
4	0	1	1.1383239	4.2739725	2.1840787
5	0	2	1.2422804	4	2.0815635
6	108	4	1.0882376	4.4246573	2.2286962
7	41	2	0.77289605	5.821918	2.7319152
8	0	1	0.74333173	6.0136986	2.7411063
9	0	1	0.69938153	6.3287673	2.6820891
10	362	6	0.8582316	5.3424659	2.4927197
11	92	3	0.93491209	4.9863014	2.3369322
12	83	4	0.93813592	4.9726028	2.341949
13	202	4	0.90989769	5.0958905	2.3899398
14	93	2	0.77289605	5.821918	2.6027226
15	0	1	0.71219742	6.2328768	2.6574693
16	188	3	1.0113733	4.6849313	2.2425504
17	7	2	0.85285079	5.369863	2.4078264
18	0	1	0.71219742	6.2328768	2.6574693
19	73	2	0.86094749	5.3287673	2.4174292
20	47	3	0.83483804	5.4657536	2.4642556
21	18	2	0.79549533	5.6849313	2.5679886
22	112	2	0.91911966	5.0547943	2.4191384
23	234	2	1.162647	4.2054796	2.1300647
24	231	3	1.2038027	4.0958905	2.0762131
25	426	6	1.0544938	4.5342464	2.1930833
26	0	2	1.2653927	3.9452055	2.0861855
27	0	1	0.8691994	5.2876711	2.5968945
28	0	1	0.74947494	5.9726028	2.7338171
29	726	3	0.93491209	4.9863014	2.4464931
30	31	2	0.70481712	6.2876711	2.864975
31	137	5	0.88014854	6.4794521	3.0268314
32	297	4	0.83714147	6.8493152	3.1428342
33	144	2	0.54740322	7.808219	3.2836449
34	0	1	0.47813603	8.7945204	3.420079
35	203	2	1.0796008	4.452055	2.2498765
36	79	3	0.92537212	5.0273972	2.3718331
37	173	5	0.85459443	4.9041095	2.3651012
38	49	3	0.80490953	5.630137	2.8529419
39	206	5	0.86643124	5.3013697	2.4430975
40	32	4	0.8691994	5.2876711	2.4537549
41	438	4	1.1335809	4.2876711	2.1468723
42	331	3	1.0668997	4.4931507	2.2032084
43	1168	5	1.3017197	3.8630137	1.9961169
44	283	4	1.0463823	4.5616436	2.1973548
45	1411	5	1.5370588	3.4246576	1.8386979
46	500	4	1.1777464	4.1643834	2.0869091
47	1409	6	1.5114412	3.4657533	1.8547187
48	862	8	0.92537212	5.0273972	2.5187616
49	1349	7	1.3396240	3.7945206	2.0171759
50	0	2	1.193243	4.1232877	2.1422298
51	2301	11	1.6290983	3.2876713	1.78188
52	253	4	1.2422804	4	2.0272136
53	219	4	1.2366337	4.0136986	2.0264373
54	132	4	1.083902	4.4383564	2.154397
55	281	3	0.71033788	6.2465754	2.8785706
56	129	5	0.6905061	6.3972602	3.0227714
57	292	4	0.78857797	5.7260275	2.7544832
58	71	3	0.77509803	5.808219	2.7253916
59	1307	5	1.4243948	3.6164384	1.9713967
60	924	4	1.1288773	4.3013697	2.260313
61	0	2	1.0796008	4.452055	2.3291367
62	104	4	0.88330978	5.2191782	2.4400232
63	132	3	0.99291754	4.7534246	2.2893839
64	0	2	0.7731258	5.7945204	2.5385103
65	314	5	0.90989769	5.0958905	2.3801451
66	190	3	0.82692832	5.5068493	2.5177767
67	16	3	0.90385187	5.1232877	2.3509817
68	111	3	0.78857797	5.7260275	2.5675237
69	280	3	1.083902	4.4383564	2.2349119
70	208	3	1.083902	4.4383564	2.2349119
71	510	3	0.80253512	5.6438355	2.6272585
72	443	5	1.0423732	4.5753427	2.1969104
73	415	5	0.87761098	5.2465754	2.4351366
			0.971082066		

Fig. 6. Before and after depthmap data(self-illustration).

4.2.4 Multi-layered space and domain creation. The spatial design of the park is centred on multi-level and multi-functionality to meet diversified needs. The former fermentation workshop in Building 16 is transformed into an art exhibition and performance space, commerce, cultural creation, leisure and other businesses using the high roof, embedded in different buildings to form a composite functional network. The design of the public space emphasises the integration of nature and humanity: the courtyard of Building 11, the water feature of Building 10 and the sunken plaza in the

west (Figure 7) divide the openness level and provide scenes for socialising and resting; the semi-enclosed space with a variety of chairs (Figure 8) creates a sense of domain and balances privacy and publicity. The rooftop garden creates an oasis in the sky based on the height of the building and becomes a node for quiet viewing. The design focuses on the reuse of industrial heritage and spatial narrative: the structure of the fermentation plant is preserved, and new functions are implanted to continue the historical memory; the courtyard and walkway connect the old and new scenes to form a coherent experience.

As shown in Figure 5, the space in the park shows a high degree of connectivity between the central commercial space and the surrounding plaza, and a lower degree of connectivity between the surrounding private areas, which proves that the transformation of the park's internal space into a multi-level division is effective. The multi-level spatial layout takes into account efficiency and interest - large-scale space carries cultural activities, and small-scale corners meet individual needs.



Fig. 7. Courtyard and water features(self-timer).



Fig. 8. Different positions and different forms of seating(self-timer).

4.2.5 Design Effectiveness and Social Response. Shenyang Hongmei Cultural and Creative Park has become a new cultural landmark in Northeast China by exploring a new path of preservation and reuse through the transformation of industrial heritage. The park attracts visitors of all ages and creative groups through exhibitions, bazaars and other activities, and promotes the development of the local cultural and creative industries. Its design practice balances historical preservation and functional innovation, and has a remarkable social response, providing an exemplary case for the revitalisation of industrial heritage.

5 Conclusion

1) The theory of environmental behaviour can effectively guide the design of industrial heritage-based creative industrial parks to enhance cultural attributes and user experience.

2) In the future, it is necessary to deepen the research on user behaviour, strengthen public participation, and explore multifunctional composite spaces.

3) The transformation of industrial heritage needs to balance historical preservation and modern needs, and promote the development of urban culture and economy through innovative design.

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