

Chapter 21

Reconstruction and Architecture

Field of expertise: Reconstruction practice, architectural planning

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Summary

Architecture is an important infrastructure that is directly related to people's daily lives, the enrichment of lives, and the maintenance of local culture. However, it was very difficult to bring such a qualitative perspective into the planning process immediately after the disaster. In the reconstruction of buildings, it is important to coordinate with civil engineering and urban planning, not only for the needs of the victims, but also for the formation of social capital, and to develop strategies for construction and operation to realize these needs.

Keywords: recovery and reconstruction, coordination with civil engineering and urban planning, social capital, comprehensive ordering, social inclusion

Introduction

Because the Great East Japan Earthquake was a complex and widespread disaster, land use planning and civil engineering were brought to the foreground, and relatively limited attention was given to architecture. However, architecture is where people live, and it is deeply related to the quality of life after recovery, such as inclusion of socially vulnerable people and maintenance of regional identity. In the actual reconstruction process, various attempts were made to look long-term, while focusing on the short-term.

1: Problems Revealed by the Great East Japan Earthquake

1. Flexible land use

In the tsunami-affected areas of the Great East Japan Earthquake, land use was revised to a large extent, with the establishment of disaster risk zones restricting residential use. Therefore, the focus shifted to how to use land in a flexible manner while also ensuring safety from major disasters.

2. Inheritance of local culture

In the reconstruction process, where the focus is on disaster safety, it is difficult to address qualitative aspects such as architectural culture and indigenous culture based on it. The Kesen region of southeastern Iwate Prefecture, one of the areas severely damaged, was the base of the Kesen carpenters, a group of engineers who left behind important buildings from the Edo period to the early Meiji period, and there are many buildings that convey their lifestyle and culture. However, the reconstruction project was extremely indifferent to what we inherited from them. In addition, attempts to revitalize the rich fishing village landscape and use it for future lodging were denounced as extravagant and devalued to a cliché that would only last a short time. There were many obstacles to incorporating long-term perspectives regarding inheritance of technology and culture, landscapes and tourism into the reconstruction process.

3. Rising construction costs

Completing projects in a short period of time is the ultimate goal of reconstruction. At the same time, however, the volume of projects has led to a shortage of materials and human resources, which in turn has led to higher construction costs. Compared to civil engineering projects, where the cost ratio is high due to performance orders and a flexible response to price risks is included, construction projects are strongly expected to be kept within the initial budget, even though there is a price indexing clause. This led to a situation where bidding irregularities occurred frequently, and even after listening to the opinions of the victims and creating careful design documents, it was impossible to realize them.

2: Paradigms Destroyed by the Earthquake

1. Reconstruction and recovery

In the field of civil engineering, prior to this earthquake, there was a step-by-step process to reconstruction. The first step involved restoration to the original pre-disaster state, then improvement restoration, which incorporated improvement, and finally reconstruction, which aims to restore and improve quality (Cabinet Office, Guide to Disaster Recovery and Reconstruction Measures, 2005). In the case of construction, however, the laws governing each facility are different, and the basic focus is on restoration. Therefore, in a situation like this, where qualitative reorganization is required, various problems surfaced. The post-disaster reconstruction law allowed reasoning to be provided after the fact, and it was difficult for decisions on-site to be made based on the principle of recovery.

2. Private reconstruction and financing

Rebuilding homes for disaster victims was regarded as a private activity, and public funds for building houses were severely restricted. This has resulted in a situation where we find poor housing on top of solid ground, suggesting the need to consider the boundary between public and private reconstruction on an outcome basis. In addition, housing loans, which have supported the home ownership policy linked to lifetime employment, played the role of the fulcrum for public spending, such as interest supply in this reconstruction. However, since it is designed to finance the finished product, it was difficult to respond to the varying needs of those who wanted to rebuild only the essential parts of a home, and then expand it later.

3. Re-inclusion of socially vulnerable people

The critical situation created by the catastrophe forces out socially vulnerable people who have been included in the family and community. There is not enough room to support them in the public welfare sector, which is under pressure from the financial authorities to tightly control the requirements for long-term care insurance. Therefore, the reconstructed environment (architecture) requires the creation of a space that fosters mutual assistance. Unfortunately, there is surprisingly little understanding and support for this.

3: A New Approach

1. Land use with building restrictions

One of the flexible land use approaches is the multi-stage designation of disaster risk zones that include building restrictions. This approach was used in the post-typhoon reconstruction of Ise Bay, between Mie and Aichi Prefectures, and was adopted by several municipalities after the disaster. However, its adoption has been limited due to the need for a variety of prior research, such as evaluating the effects of complex tsunami simulations and examining the impact of building regulations on real estate values and actual building designs. The city of Kamaishi, Iwate Prefecture, which adopted this strategy and achieved urban reconstruction with little or no bulking, has used reconstruction projects to create a compact city by concentrating on building public disaster housing with the first floor as a parking lot.

2. Mutual assistance housing

In response to the frequent occurrence of solitary deaths in public disaster housing after the Great Hanshin-Awaji Earthquake, community-oriented public disaster housing was built in the Great East Japan Earthquake, although not in large numbers. In Miyagi Prefecture's Shichigahama Town and Iwate Prefecture's Kamaishi City, the city set up guidelines and introduced living-access public housing on a large scale. In Miyagi Prefecture's Tagajo City, the urban revitalization organization has built public housing with shared spaces. In Soma City, Fukushima Prefecture, and Ishinomaki City, Miyagi Prefecture, public disaster housing with mutual assistance has been constructed (Figure 21-1).

3. Cooperation between civil engineering and architecture

The cooperation between civil engineering and architecture is also an important but difficult area to realize. In the Ayukawa area of Ishinomaki City, Miyagi Prefecture, an environment center was built by integrating a seawall, prefectural roads, cultural facilities, a local commercial center, and facilities of the Ministry of the Environment. In Kamaishi City, Iwate Prefecture, architecture and civil engineering collaborated in the reconstruction of school facilities. In the reconstruction of the Higashi Junior High School and Unodome Elementary School in Kamaishi, a design proposal was adopted to reduce the estimated amount of cut soil to about a quarter, and to maintain the mountain body as a symbol of the region (Figure 21-2).



Figure 21-1. Living-access Housing (O Housing, Kamaishi City, Iwate Prefecture)
 Design: Chiba University Architectural Planning Office + Daiwa House Industry Co., Ltd.
 Design support: Tohoku University Onoda/Tsukada Laboratory

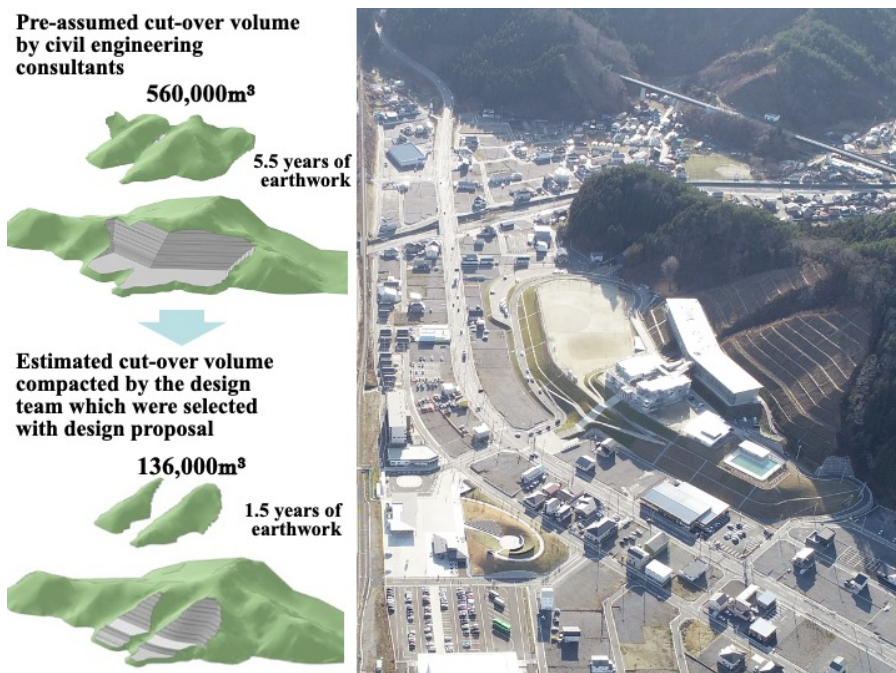


Figure 21-2. Mutual-assistance Disaster Public Housing (S District, Ishinomaki City, Miyagi Prefecture)
 Design: Hitoshi Abe Atelier + Daiwa House Industry Co., Ltd.
 Design guidance: Tohoku University Onoda/Tsukada Laboratory

4. Development of a new ordering strategy

In order to combat the rising costs, one feature of the reconstruction process that was adopted was to order designs and materials all at once. In addition, early contractor involvement (ECI) was introduced, in which the prospective contractor participates as an advisor in the implementation design. There have been some important attempts, such as the construction council system, in which local construction companies work together.

4: Achievements and the Future

Although valuable trials have been made during the reconstruction process, there is still a long way to go before reconstruction with a long-term perspective can be realized. There are many issues that need to be resolved, from technical issues such as how to position architectural reconstruction, which tends to include qualitative evaluation, to frameworks such as building a platform that allows for multi-layered consideration of everything from institutions to daily life, and fostering multilingual experts who can understand other languages for collaboration.

Conclusion - From the author

When we (Yasuaki Onoda - Architecture, Katsuya Hirano - Civil Engineering, Michio Ubaura - Urban Planning) started getting involved in the reconstruction work as part of our responsibility as people who work at Tohoku University and in the disaster area, we asked Prof. Nobuo Suto, who is a pioneer in tsunami research, for advice. The first thing he showed us was the land use regulations, including building restrictions, in the reconstruction from the Ise Bay typhoon. Prof. Suto was aware immediately after the disaster that sincere cooperation between urban planning, civil engineering, and architecture is of utmost importance in true disaster prevention and recovery.

References

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