
Activities of the Building Department in response to dynamically changing social needs

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1. Introduction

The mission of the Building Department is to respond to the various needs of the citizens and society, which are dynamically changing in response to the movement of the world and to realize a safe, secure, and comfortable building environment. We are, therefore, providing administrative support for the planning, proposal, establishment, and revision of various technical standards, including the Building Standards Act based on scientific and technical knowledge. Other activities include investigations in areas damaged in natural disasters, exploration of future measures to implement, reflection and spread of outcomes of investigations and research to society, and provision of technical support for organizations inside and outside Japan. The section below introduces the themes of the main research projects we are now conducting. The goal of research projects 1 to 2 is to create and revitalize the attractiveness of rural communities, which are one of the recent needs of society, and projects 3 to 5 are for the realization of a safe and secure society, which have been the conventional needs.

2. Themes of main research projects now underway

1) Technological development to support the use of already available buildings by rationalizing fire control and evacuation regulations (General Technical Development Project: 2016–2020)

The national government has set the year 2015 as the first year of the rural community revitalization to promote efforts to ensure that safe, secure, and emotionally fulfilled lifestyles would continue further into the future by overcoming issues, such as a declining population and the shrinkage of rural economies. To realize such a goal, local governments and private businesses, which are building their communities, demand the use of currently available buildings, such as historical buildings, which are valuable assets for the rural communities, by turning them into hotels and restaurants so that they would revitalize tourism and the local economies. The environment needs to be developed to smoothly support such activities. Thus, the goal of this research is to develop technologies to rationalize fire control and evacuation regulations and uses and to streamline operations to realize smooth use of already available buildings.



Photo: Example of changing uses (switch from a school to elderly housing with services and nursery school)

(*Smoke extraction systems and restrictions on interior materials become requirements depending on facility sizes, which often makes it difficult to realize such projects.)

2) Development of design and construction technologies for mixed-structure buildings using new types of wooden materials (General Technological Development Project: 2017–2021)

The Basic Policy on the Creation of Town, People, and Work that was adopted as a cabinet decision in 2015 clearly set a goal to further reinforce the promotion of the development and the spread of CLT and other materials, and the switching of public facilities into wooden buildings to promote the use of wood in buildings for the purpose of (1) accelerating the revitalization of the rural economy, (2) solving environmental problems, and (3) creating spaces where wooden materials are used. The purpose of this research is to conduct technological development concerning the structure, fire control, and durability to develop design and construction technologies for mixed-structure, mid-rise buildings in which different structural types are combined, such as the combination of wooden structures using large wooden panels, such as CLT with RC structures and steel structures, to further accelerate the transformation of buildings into wooden buildings to realize the various needs for the use of wooden materials, expansion of versatility, reduction of construction periods, and response to the need to show wooden materials on the surface based on this Basic Policy.

3) Research concerning the evaluation of safety and reusability of buildings damaged by fire caused by earthquakes (Categorical research: 2015-2017)

This research theme aims to support the establishment of an emergency risk assessment manual (draft) targeting mid-to-high-rise fireproof buildings damaged by fire caused by earthquakes, to secure evacuation shelters immediately after an earthquake through the construction

and systematization of evaluation technologies for repairs and reuses, to prevent secondary damage, and to reuse damaged buildings.

4) Development of simple method to evaluate the performance of wooden houses (Categorical research: 2016–2018)

This research aims to develop and spread easy methods to evaluate the structural performance of wooden houses based on information obtained through precut diagrams used during the production of wooden houses to promote performance labeling (earthquake resistance grade).

5) Development of technologies to renovate facilities to secure the health and safety of evacuees in evacuation shelters (Categorical research: 2017–2019)

This research aims to present the necessary performance, renovation technologies, and emergency response technologies concerning the power, water, toilets, acoustic environment, optical environment, thermal environment, privacy, and other aspects of evacuation shelters by taking into account of chronological changes from the onset of a disaster to the period where the livelihood of the people is secured for the purpose of reducing physical and mental health damage during the time spent in shelters.

3. Continuous usability becomes a major theme in future activities

Since the 2016 Kumamoto Earthquakes, the Ministry of Land, Infrastructure and Transport is conducting focused efforts to realize a safe and secure society that is resistant to natural disasters.¹ One of such efforts include the Functional Continuity Guidelines concerning Buildings to be Used as Disaster Management Bases that the Housing Bureau is now examining with the support of the Cabinet Office, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Health, Labour and Welfare, and Government Buildings Department. The Building Department is also playing a major role in the preparation of the draft. This is considered to be the effort to respond to the need for a modern and mature society demanding to prevent social confusion and disorder caused by the inability to use buildings that are damaged in a major earthquake unlike the conventional regulations that are based on minimum standards. The continuous usability is likely to become one of the main points of our future activities. Their outlines are introduced below.

Many of the government buildings and evacuation shelters that were expected to function as disaster management bases after the onset of an earthquake became unusable after an earthquake even though they did not collapse nor were they destroyed. The Building Standards Act stipulates the minimum standards for buildings. Its purpose is to prevent the collapse or destruction of buildings after a major earthquake. On the other hand, buildings to be used as disaster management bases are expected to have higher performance to keep

providing their functions after a major earthquake.

These Guidelines provide the basic and common

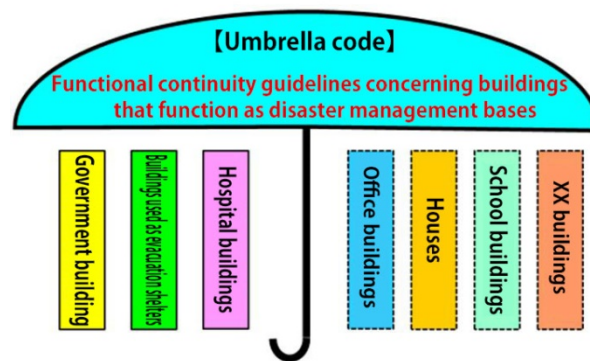


Figure: Position of the Functionality Continuation Guideline concerning Buildings to be Used as Disaster Management Base (concept)

among owners, architectures, and administrators of buildings. The guides for the design and construction of functional continuity to suit the purposes of specific buildings, such as government offices, evacuation shelters, and hospitals, are expected to be organized based on the principles of the Guidelines and applied to society. In addition, these guides should also be used as the reference for private houses and business offices to create a resilient society with a higher level of safety and security. These are essential tasks to prevent evacuation shelters from becoming overwhelmed and ending up rejecting people evacuating from damaged houses in the case of major earthquakes, such as the Nankai Trough Earthquake and large earthquakes directly hitting Tokyo, and to prevent offices and factories from being damaged and becoming unable to continue operations, consequently affecting economic and social activities in and outside of Japan.

The continuous usability of buildings is currently based on an examination method in which seismic design force is gradually increased to find a force that would not collapse or destroy a building. Yet, this method is not enough to find the condition of damage in buildings after a major earthquake. It is not easy to propose business continuity plans (BCP) with this method, either. In the future, a shift is expected to new examination methods based on response deformation and/or other factors that can estimate response conditions in the different parts of a building after an earthquake and judge whether the conditions are tolerated from the perspective of functional continuity expected from the building. This is a meaningful challenge to respond to new needs.

☞ For detailed information

1) Building Guidance Division, Housing Bureau, Ministry of Land, Infrastructure, Transport and Tourism Review Committee on Functional Continuity Guidelines for Buildings Used as Disaster Management Bases Guidelines

<http://www.mlit.go.jp/jutakukentiku/build/jutakukentiku>

[house_tk_000088.html](#)