

# Development of Technologies to Improve and Renovate Equipment to Maintain the Sufferers' Health and Secure Safety in a Shelter

Period of research: FY2017 to 2019

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## 1. Introduction

When a huge earthquake, such as the Nankai Trough Mega-quake and the Tokyo Inland Earthquake, occur, the number of evacuees is expected to be in the millions. If life in a shelter is prolonged, it is necessary to prevent mental and physical health hazards from occurring and to secure safety in the shelter. Therefore, preparation of the methods to improve the living environment in a shelter is required. Although there are provisions to prevent health hazards in the guidelines for living in a shelter included in the existing disaster prevention measures, information about concrete methods for improvement and renovation is insufficient.

Research and development to address these backgrounds and issues are planned for FY2017 and onward. We would like to introduce the outline of this research

## 2. Outline of the Research

### 2.1 Development of Technologies to Maintain People's Health in a Shelter

The purpose of the research and development is to propose concrete methods and renovation technologies in order to maintain the conditions of toilets, hygiene, and privacy and secure the performance of noise reduction, heating, and lighting in terms of the living environment in a shelter. The technologies we are going to develop to maintain people's health in a shelter are outlined in Figure 1. The skeletal idea of the partition we are going to develop is shown in Photo 1. To be concrete, they include the development of a packaged DC supply system by solar power generation or rechargeable batteries, the development of sound-absorbing partitions to reduce noise in a space that echoes, the proposal of lighting arrangements depending on how the shelter is compartmented, and development of a method to adjust the light intensity, the development of a toilet system that can be installed easily, and the development of technologies to improve the hygienic environment of temporary toilets.

### 2.2 Development of Technologies to Ensure Safety in a Shelter

We are going to develop techniques for determining whether the building is usable as a shelter, a method to grasp the situation of damage on the building equipment, and a method to improve the aseismic performance of ventilation and air-conditioning equipment which is conducted at the same time as the enhancement of the earthquake resistance of ceilings.

### 3. Application of Research Results

Our aim is to support the efforts of local governments to map out disaster prevention measures by reflecting these results in the guidelines of the disaster prevention manuals. They will help reduce physical and mental health hazards and improve safety at a shelter.

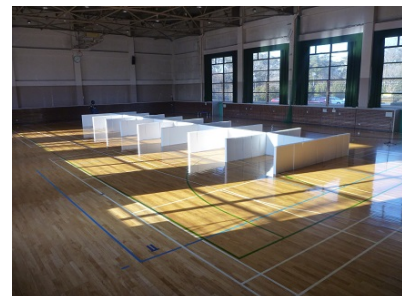


Photo 1: Schematic Image of Partitions to be Developed

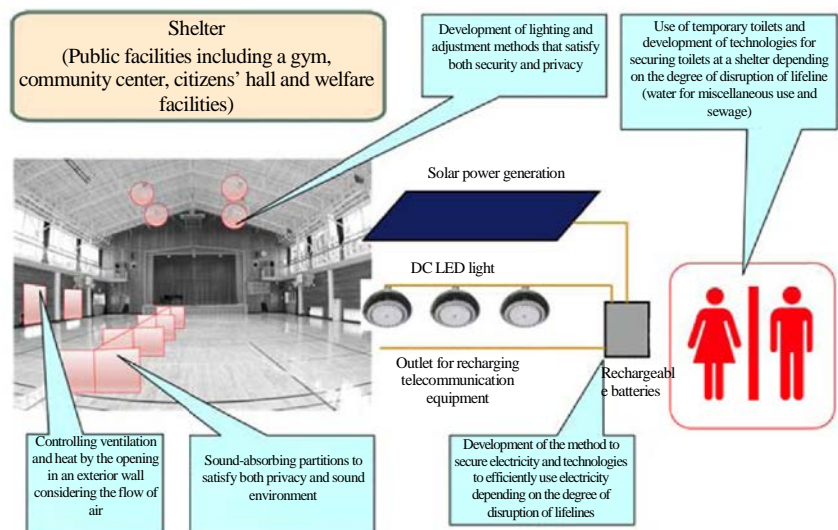


Figure 1: Outline of the Development of Technologies to Maintain People's Health in a Shelter