

# Possibility of improving the comfort of already constructed houses while residents are living there (Study period: FY 2018–)

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## 1. Introduction

Houses constructed many years ago were built based on lower standards of sound insulation performance, energy conservation performance, and barrier-free performance. Also, the layout and facilities tend to be outdated. From the viewpoint of effectively using housing stock, it is necessary to renovate the structure to improve the level of comfort so that people in the various generations can live comfortably in the house. The improvement in the level of comfort of housing stock is effective in redeveloping residential areas in the suburbs, which have become aged, because it can encourage younger generations to move in. Meanwhile, an important point is to be able to execute the renovation while residents are living there\*1 This is important from the perspective of consensus building in condominiums and the difficulty in finding temporary rental housing.

## 2. Required standards for specifications, performances, and renovation of already constructed housing

Targeting residential complexes, changes (trends) in specifications and performances based on the year of construction were organized, and specifications and performances of already constructed housing, which becomes the base of renovation, were identified. In addition, the needs of households with the intention to move to residential areas in the suburbs were identified through online surveys. The main specifications and performances that need to be improved in already constructed housing and the standard levels to be satisfied were set.

## 3. Reality of renovation while residents are living there and its possibilities

The study organized the challenges and possibilities based on the relationship among the reality of executing the renovation while residents are living there to improve safety, such as earthquake resistance, building barrier-free designs that are in high demand among young families with small children and elderly households, the thermal environment, the specification and performance level of already constructed housing, and the standards required for the renovation.

The possibility of implementing the renovation while residents are living there was examined by organizing the points that require precautions, such as the installation of an elevator on the balcony side of a mid-rise housing building with a staircase, minimization of the number of residents to relocate temporarily by the unit of each floor, expansion of living spaces by combining two small units into one, conditions of construction to improve insulation performance using exterior insulation and double sashes, and construction plans. The actual conditions of noise and vibrations caused by chipping and drilling on the building frames and their effects on residents were also examined.

\*1 This article covers renovations that can be made without requiring all residents to relocate altogether during the construction period, renovations that can be made without requiring contractors to enter inside the housing, renovations that can be made while residents other than the ones in the housing to be renovated are still living there, and renovations that minimize the period during which residents of the housing under renovation have to stay in temporary housing.



Photo 1: Installation of an elevator between two buildings (public rental housing)



Photo 2: Improved insulation performance using exterior insulation + double sashes (private condominium)



Photo 3: Expansion of living space by combining two units into one (public rental housing)