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**Introduction to a New Design Concept for
Buildings with Predetermined Service-life
and Conditions of Use**



Architectural Institute of Japan

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Preface

At the end of the 20th century, global environmental issues became one of the main issues of buildings. Longevity of service-life is considered one of the solutions. On the other hand, the social needs of buildings with predetermined service-life, such as efficient use of land leasehold, coping with obsolescence of a building owing to drastic changes in society, low cost orientation (reduction of design load and/or durability requirement), and experimental verification of new materials and new construction methods, have been increasing.

In order to meet these social needs, Architectural Institute of Japan (AIJ) organized a panel discussion in 1992 and proposed to consider the concept of service-life of a building more explicitly so that not only the safety of the building can be achieved more economically but also the development of new building technologies can be encouraged and promoted. AIJ moreover organized a panel discussion and proposed a “Draft Guideline for Structural Design of KIGEN-TSUKI Buildings” at AIJ Annual Convention in 2002, in which “KIGEN-TSUKI building” means “a building with predetermined service-life and conditions of use” in Japanese. In the draft guideline, KIGEN-TSUKI building was defined, and it was pointed out that the selection of service-life has a significant impact on the level of design load and, accordingly, the performance level of the building. In principle, it should also be disassembled at the end of its predetermined service-life. In the discussion, which focused on the care of the building following the end of its predetermined service-life, two issues were raised. One of the issues was construction of a “member utilization system to reuse rather than to discard,” and the other was “possibility and concept of renewal of predetermined service-life.”

In order to deal with the first issue, the subcommittee for KIGEN-TSUKI Buildings in AIJ published a document “AIJ Manual for Re-using Structural Members” in 2009. In order to deal with the second issue, a document, “AIJ Recommendations for Design of Buildings with Predetermined Service-life and Conditions of Use (Design of KIGEN-TSUKI Buildings)” was published in 2013.

The document consists of five chapters. In Chapter 1, definitions of terms related to KIGEN-TSUKI buildings are provided, followed by a description of the life of a KIGEN-TSUKI building from planning to the end of its predetermined service-life. Chapters 2, 3, and 4 are devoted to planning, structural design, and regulations in use, respectively. Chapter 5 discusses the treatment of the building at the end of its predetermined service-life and the possibility of renewal of the term. It includes main text and full commentary in Japanese.

This is a brief introduction in English to the document; “AIJ Recommendations for Design of Buildings with Predetermined Service-life and Conditions of Use (Design of KIGEN-TSUKI Buildings)” published

in 2013. This document consists of the translation of the main text and footnotes for the brevity avoiding translating the full commentary of the *Recommendations* which are included the original document.

The purpose of the publication in English is to propose the ideas and concepts of KIGEN-TSUKI buildings to worldwide engineering community in various countries and regions. We appreciate this material is used for discussing KIGEN-TSUKI buildings by researchers and structural engineers.

The concept of KIGEN-TSUKI buildings shown in this book and the Japanese version of the *Recommendations* is not necessary fully conformed to the current Building Standards Law of Japan, which are the regal standards for the design and construction of new buildings in Japan. However, The Building Standards Law of Japan may be necessary in understanding the contents of this book. The full English translation version of The Building Standards Law of Japan is published by The Japan Building Center (BCJ).

It should be noted that a KIGEN-TSUKI building is not a special building. It unifies the design concepts of permanent and temporary building structures and is used during a predetermined service-life for a predetermined condition of use. We should be aware of the service-life in planning of any buildings. This document introduces a new design philosophy which conceives a new concept of sense of values for developing a sustainable society. We hope this document will help us to think of how buildings should be in the future.

January 2021
Architectural Institute of Japan

Reported by

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This document is based on “AIJ Recommendations for Design of Buildings with Predetermined Service-life and Conditions of Use (Design of KIGEN-TSUKI Buildings)2013” written by the following committee.

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