Rationalization of Sound Isolation and Lighting Performance Evaluation in the Housing Performance Indication System

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1. Introduction

The indoor living environment required for housing has become varied in recent years due to the advancement of working from home, and a method for appropriate evaluation is needed according to each varied level required. Also, as part of the measures to counter sub-replacement fertility, homes are needed where children can be raised securely. One aspect of this is the necessity of expanding housing complexes with high quality sound isolation.

One of the metrics for evaluating the quality of housing is the Housing Performance Indication System pursuant to the "Act on the Promotion of Housing Quality Assurance." The Equipment Standards Division is engaged in research and development that contribute to the establishment of evaluation techniques corresponding to changes in the needs in recent years, regarding the matters related to the light and visual environments and sound environment, among the matters related to the indoor living environment. This paper presents the details of studies toward the rational improvements in the evaluation methods for sound isolation performance and lighting performance.

2. Survey on the sound isolation performance of non-RC housing complex

Regarding non-RC housing complex, there are two methods for obtaining sound isolation performance data. One is shown by the housing supplier side: cases where measurements are made in an actual building; and the other is cases where it is made in a laboratory. But no methodology re-reading the difference in the method of measurement has yet been established, and it has been pointed out by consumers in general that a comparison between these two types of data is difficult to understand.

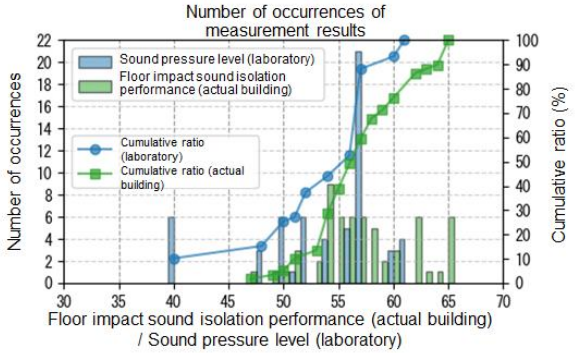

Fig.-1 Comparison of sound isolation performance between an actual building and a laboratory building

The NILIM collected and compared the data of sound isolation performance against heavy floor impact sound in an actual building and a laboratory having the same floor structure, as obtained by measurements performed by multiple suppliers. A tendency was found in which the data measured in the laboratory was distributed more toward the side of higher performance around several dB than the data measured in the actual building (Fig.-1).

3. Survey on the effects of adjacent environments on lighting performance

The amount of lighting from a window is greatly affected by the area of the window as well as adjacent environments such as the distance from the window to the adjacent building. A study of the relationship between the adjacent environments of an individual building and lighting has been made possible by using daylight simulation, but it involves a high working load and is not suitable for simplified evaluation.

In order to grasp the relationship between the difference in adjacent environments and lighting performance, we carried out a web questionnaire survey, and conducted a study of the effects of the building density neighboring the living area of the replier on lighting performance. A tendency was apparent in which, in a detached house in a low density area, the satisfaction of lighting is likely to be more assured even if the area of the window is small, as compared with that in the high density area (Fig.-2).

4. Future developments

In the Housing Performance Indication System, we plan to continually implement studies that will contribute to the development of evaluation and indication methods that are reasonable and easy to understand, from the viewpoints of both consumers and suppliers.

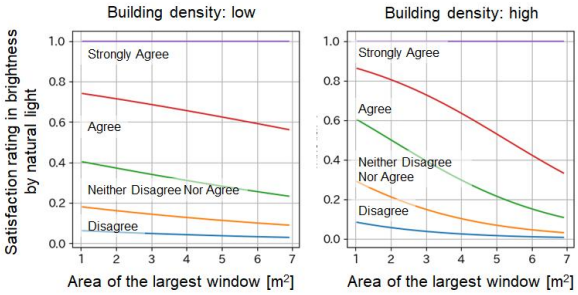

Fig.-2 Relationship between window area and lighting satisfaction