

Research Trends and Results

Outer wall diagnosis technology for long life use of the building

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1. Introduction

Appropriate control and maintenance are required to maintain the building outer wall in a good condition and there is a risk that the outer wall drops and results in a serious accident to cause injury on the third party if you failed to keep periodical check and diagnosis.

Revision on the periodical report institution of the Building Standards Act chapter 12 has obliged us to carry out the outer wall research through the overall sounding on the specific building that has passed 10 years from final completion or large degree reconstruction since April 2008. However, practice of the research diagnosis remains low percentage as it is required to prepare a foothold to implement the outer wall research through the overall sounding and it costs high. Although infrared ray diagnosis is utilized as the diagnosis method without foothold, but what is ongoing is the combination use with the overall sounding as the climate and location conditions might make the infrared ray diagnosis difficult to practice.

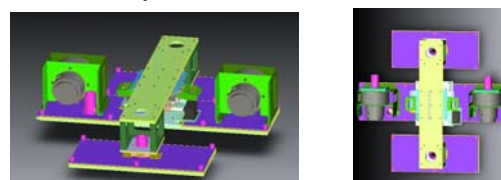
Based on such a situation, we have started to develop the outer wall diagnosis method that is simple and reliable and further possible to have qualitative evaluation and proceeded on the study on how to practice the outer wall diagnosis and what to consider its result on trying experimental verification.

2. Developing the outer wall diagnosis system and diagnosis guideline

We have made a prototype of the “Wall face running outer wall diagnosis system” that self-runs on the wall face and implements the sounding diagnosis in a given place in order to realize the outer wall research in a place difficult to approach for the inspector such as on high place outer wall. (Refer to the figure.) The prototype has perpendicular three legs and runs on the wall face stepping the upper and lower two legs and central one leg alternatively. Diagnosis to detect loosen tile and the like is implemented based on the sounding method.

Furthermore, there is a problem of variation on the diagnosis depending on the skill and experience of the

inspector in the sounding inspection that is a basis of the actual outer wall diagnosis. Therefore we have developed the “Manual outer wall diagnosis system” that enables the qualitative evaluation and makes it possible to leave the data of the diagnosis result. We were supposed to have used it in a same manner of using the sounding stick in the sounding inspection and made a specification that can be used in a daily check.



a. Diagonally looked view b. Looked from upward

Fig. Wall running type outer wall diagnosis system prototype and method, we have also made the guideline or

The outer wall diagnosis investigation and filed the technology material. In particular, on the reconstructed and/or repaired wall, it is difficult to judge whether deterioration such as loosen parts is increased or not different from the wall before reconstruction. To refine the guideline, we have verified the applicable range of the sounding method and infrared ray method including the reconstructed wall in the study objective and studied on the alternative investigation method and historical data on the reconstruction work required for the control and maintenance. Those results were used for the guideline of the practical method, evaluation and judgment of the outer wall diagnosis.

3. Future planning

We are to make the public announcement of the performance and specification of developed wall face running outer wall diagnosis system and do filing of the outer wall diagnosis guideline (Plan) and technology material with the objective of reconstructed wall and start to finalize and control the technology so that the outer wall diagnosis is ensured to put to practice.