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Title : Integrating Safety Elements into Post Occupancy Evaluation for Low-Cost Housing in Malaysia

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The general building conditions in low-cost housing act as an indicator of human quality of life. The enhanced aspects on quality will create a safe environment for the occupants. However, issues arisen have concerning the delivery performance in Malaysia's low-cost housing since the occupants are likely to perceive safety hazards. The safety issues and challenges during the occupancy period include structural instability and falling building fragments. Without defining the occupants' requirements in the early housing development, it is hard to determine the prevailing safety factors. To achieve a better safety provision during the occupancy period, this study used the Post Occupancy Evaluation (POE) approach that incorporates participation from the occupants. POE is used to examine specific performance issues in the building occupancy stage. It generally encompasses a comprehensive review of the building's current situation. The fundamental concept of POE stresses the importance of obtaining feedback from the building occupants. Therefore, the main aim of this research is to develop a Post Occupancy Evaluation (POE) framework that integrates safety elements for low-cost housing (LCH) in Malaysia to meet the occupants' satisfaction level of LCH. A building inspection survey and occupants' satisfaction survey was conducted to 24 low cost housing schemes, known as Program Perumahan Rakyat (PPR) housing schemes in Kuala Lumpur, Malaysia. The sample size for both surveys was 380 (380 for housing units; 380 for occupants). Statistical correlation was used to affirm the incorporation of occupants in respect of safety performance in the POE approach. The analysis used Spearman's rho correlation since the variables in both surveys consist of an ordinal scale. It was found that all attributes have a significant relationship

and successfully support the research hypotheses. In other words, the user's satisfaction has a direct relationship with the overall safety performance of buildings in meeting the needs and expectations of the users. The results have generated an insight into the effectiveness of POE as a means of assessing safety performance. The development process of the framework utilized the vital phases of POE and inputs of safety elements, which were validated through the methodology phases in this research. There are three main phases in this framework: i) planning phase, ii) conducting phase and iii) applying phase, which are related to the concept of POE. The phases involved the safety category, safety elements and safety attributes that have been determined and developed through the preliminary survey, the semi-structured interviews and the main survey. The developed framework shows the steps undertaken for each phase and provides a description of the activities addressed in each step. The results from the validation interviews with the industry practitioners have allowed the usage of the proposed framework for improving safety performance to meet the satisfaction of the occupants. The proposed framework has fulfilled the vital phases of POE and integrates the safety elements with the satisfaction of occupants. The applicability of POE as the assessment tool has generated a new method to optimize housing safety performance during the occupancy stage. The proposed POE framework with integrated safety elements is able to provide a significant input to related government and housing agencies. It is also suggested that the framework is able to propose a modification and improvement concerning the safety performance and maintenance in low-cost housing during the period of occupancy.