

別紙様式 8 (Attached Form 8)

研 究 主 論 文 抄 録 Abstract of Thesis

論文題目 Title of Thesis

Development of windows with natural ventilation and sound proofing  
(換気機能を有する防音窓の開発)

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専攻 Architecture and Environment Planning 講座 Doctor Course

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主論文要旨 Summary of Thesis

Currently, the global warming is one of the most serious issues to be addressed all over the world. One of the methods to reduce the effects of global warming is the search for new energy sources to replace current ones. In parallel, saving or avoiding the use of existing energy sources is an important issue in our lives now. Numerous studies on assessing the acoustic performance of vented facades to inner rooms have been published. However, there are still limited researches on the particular case of housing in tropical and developing country, where the noise propagation needs to be prevented, the natural ventilation is demanded, but technique and economic condition are limited. Attending that demand, a concept for manufacturing windows which are capable of ventilating, regulating sunlight and reducing traffic noise for the developing tropical countries, especially low-cost to produce has been proposed. In order to improve living quality of the people in tropical countries and contribute to energy preservation, new model of casement door and windows allow both ventilation and soundproofing abilities. It combines two basic components: ventilation and lighting. The lighting unit can be constructed using one or two glass layers which are mounted between two rectangular ventilation components with input and output openings. The unit requires a simple internal structure and large input and output to maximize ventilation as well as preventing outside noise from entering the home. The effectiveness of soundproofing of this design has been proved in published. Nonetheless, in order to have a great soundproofing effect, it is necessary to take into consideration the dimension and placement of input and output openings in such a way that would minimize the effects of higher-order mode. Needless to say, a more important selection is the shape of SVU. Consequently, given more concern about the efficiency of lighting, this window has a defect needs to be improved.