

Sustainable Design Features Implementing Public Rental Housing for Remodeling

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Abstract : Buildings produce more than one thirds of the total energy consumption and CO₂ emissions. Korean government agency pronounced and initiated Zero Energy Buildings policy for construction as of 2025. The net zero energy design features include passive (daylight, layout, materials, insulation, finishes, etc.) and active (renewable energy sources) elements. The Zero Energy House recently built in Nowon-gu, Korea is provided for 121 households as a public rental housing complex. However most of public rental housing did not include sustainable features which can reduce housing maintaining cost significantly including energy cost. It is necessary to implement net zero design features to the obsolete public rental housing during the remodeling procedure since it can reduce housing cost in long term. The purpose of this study is to investigate sustainable design elements implemented in Net Zero Energy House in Korea and passive and active housing design features in order to apply the sustainable features to the case public rental apartment for remodeling. Housing complex cases in this study are Nowan zero Energy house, Gangnam Bogemjari House, and public rental housings built in more than 20 years in Seoul areas. As results, energy consumption in public rental housing built in 5-years can be improved by exterior surfaces. Energy optimizing in case housing built in more than 20 years can be enhanced by renovated materials, insulation, replacement of windows, exterior finishes, lightings, gardening, water, renewable energy installation, Green IT except for sunlight and layout of buildings. Further life costing analysis is needed for energy optimizing for case housing alternatives.

Keywords : affordable housing, remodeling, sustainable design, zero-energy house

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