

Analyzing the Shearing-Layer Concept Applied to Urban Green System

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Abstract : Currently, green rating systems are mainly utilized for correctly sizing mechanical and electrical systems, which have short lifetime expectancies. In these systems, passive solar and bio-climatic architecture, which have long lifetime expectancies, are neglected. Urban rating systems consider buildings and services in addition to neighborhoods and public transportation as integral parts of the built environment. The main goal of this study was to develop a more consistent point allocation system for urban building standards by using six different lifetime shearing layers: Site, Structure, Skin, Services, Space, and Stuff, each reflecting distinct environmental damages. This shearing-layer concept was applied to internationally well-known rating systems: Leadership in Energy and Environmental Design (LEED) for Neighborhood Development, BRE Environmental Assessment Method (BREEAM) for Communities, and Comprehensive Assessment System for Building Environmental Efficiency (CASBEE) for Urban Development. The results showed that LEED for Neighborhood Development and BREEAM for Communities focused on long-lifetime-expectancy building designs, whereas CASBEE for Urban Development gave equal importance to the Building and Service Layers. Moreover, although this rating system was applied using a building-scale assessment, "Urban Area + Buildings" focuses on a short-lifetime-expectancy system design, neglecting to improve the architectural design by considering bio-climatic and passive solar aspects.

Keywords : green rating system, urban community, sustainable design, standardization, shearing-layer concept, passive solar architecture

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