

Low-Impact Development Strategies Assessment for Urban Design

Authors : Y. S. Lin, H. L. Lin

Abstract : Climate change and land-use change caused by urban expansion increase the frequency of urban flooding. To mitigate the increase in runoff volume, low-impact development (LID) is a green approach for reducing the area of impervious surface and managing stormwater at the source with decentralized micro-scale control measures. However, the current benefit assessment and practical application of LID in Taiwan is still tending to be development plan in the community and building site scales. As for urban design, site-based moisture-holding capacity has been common index for evaluating LID's effectiveness of urban design, which ignore the diversity, and complexity of the urban built environments, such as different densities, positive and negative spaces, volumes of building and so on. Such inflexible regulations not only probably make difficulty for most of the developed areas to implement, but also not suitable for every different types of built environments, make little benefits to some types of built environments. Looking toward to enable LID to strength the link with urban design to reduce the runoff in coping urban flooding, the research consider different characteristics of different types of built environments in developing LID strategy. Classify the built environments by doing the cluster analysis based on density measures, such as Ground Space Index (GSI), Floor Space Index (FSI), Floors (L), and Open Space Ratio (OSR), and analyze their impervious surface rates and runoff volumes. Simulate flood situations by using quasi-two-dimensional flood plain flow model, and evaluate the flood mitigation effectiveness of different types of built environments in different low-impact development strategies. The information from the results of the assessment can be more precisely implement in urban design. In addition, it helps to enact regulations of low-Impact development strategies in urban design more suitable for every different type of built environments.

Keywords : low-impact development, urban design, flooding, density measures

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