

The Application of Green Architecture to Residential Building Development

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Abstract

As a result of excessive construction and development, the earth environment has severely deteriorated. Based on the data from Architecture and Building Research Institute, Ministry of the Interior, the amount of CO₂ emissions of the construction industry has exceeded one quarter of the national total. The CO₂ emission distribution is 9.31% for building materials production, 0.2% for construction, 1.49% for materials transportation, 11.88% for residential daily energy use and 5.94% for commercial daily energy use with a total of 28.82%. It can be seen that the residential buildings play a key role on energy saving and CO₂ emission reduction policy. Although, at present, new residential buildings over 50 million NT dollars are required to execute green architecture design to conform to the green architecture labelling system based on the related building regulations, the government policy of green architecture on residential buildings has been more or less passive. For the general residential buildings built earlier and newly built, the government is not yet to require them to comply with the green architecture labelling system. Therefore, it may influence the promotion of energy saving and carbon dioxide emission reduction policy. The green architecture development of residential buildings is influenced by a lot of criteria. By studying those criteria, the

most easily implemented or most cost effective criteria can then be applied to them. This research tries to establish a assessing framework for applying green architecture to residential building development. This research first, through literature reviews and and expert interviews, determines the criteria and sub-criteria to be used in the initial assessing framework. Then, through expert questionnaires, the Delphi method is used to finalize the assessing framework. Finally, the Analytic Hierarchical Process (AHP) is used to identify the relative weights of criteria and sub-criteria. From the relative weights of criteria, the building materials criterion has the greatest impact on the application of green architecture to residential building development. The priority weights of sub-criteria can help us understand when to apply those sub-criteria. In gernerel, the sub-criteria with high priority weights can be immediately implemented in the existing and newly built residential buildings and the sub-criteria with low priority weights should be implemented in the design stage.

Keyword : Green Architecture; Delphi Method; AHP; Residential Buildings