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Passive Cooling Techniques for Enhancing the Building Sustainability Development

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STATEMENT

This thesis is submitted to Ain Shams University for the degree of Master of Science in Architecture.
The work included in this thesis was accomplished by the author at the department of Architecture; Ain Shams University during the period from may 2005 to Mars 2010
No part of this thesis has been submitted for a degree or a qualification in other university or institute.

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A C K N O W L E D G E M E N T S

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ABSTRACT

Technology plays an important role in building sustainability development, such that it is being used to extract natural resources, modify them for human purposes, and adapt them to man main requirements. This research presents the methods to deal with the limited resources in an efficient approach. Creating comfort indoor spaces is considered to be the main target that architects is trying to achieve. In summer times, the internal space overheating is the main problem which should be avoided. Conventional cooling systems have been widely used for providing comfort indoor spaces, but they have many health side effects besides they need huge construction costs as well as their high running costs. Alternative passive cooling techniques have proved their effectiveness for supplying healthy and comfort indoor spaces. They have also the potential to reduce construction and running costs. This research provides the guidance and criteria for designing sustainable buildings to be totally or partially naturally cooled. Moreover, various innovative natural cooling techniques, their principles, and applications in modern buildings are reviewed in this research. Since it is important for man to live and work in a healthy environment, then this research will study the effectiveness of applying various passive cooling systems in sustainable office buildings with considering their potential advantages.

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