

**Passive Solar Urban Design - Shadow Analysis of
Different Urban Canyons**

التخطيط العمراني المستدام: تأثير التشميس على التشكيلات العمرانية المربعة والإشعاعية

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Abstract

Although thermal comfort methods on a architectural scale are at present well developed, the approach and the techniques applied on an urban scale are yet to be consolidated in order to promote a climatic responsive urban design. The main goal of the study, which is a continuation of the researcher's efforts in his PhD thesis, is to examine the relationship between different urban forms and the shadow patterns they generate, and to develop evaluation tools for deriving climatic design criteria and information suitable for use by designers. In addition, the experiment intends to verify the common method used by architects to determine the most suitable spacing between buildings to avoid overshadowing and maintain good solar accessibility, as well as to clarify its limitations. Therefore, the experiment compares patterns (radial and rectangular) with different orientations, in order to clarify the relation between the orientation and the generated shadow pattern, so that an acceptable standard of solar accessibility could always be considered with the orientation of the urban pattern in mind. Hence, the study was also performed in order to determine the urban fabric that will allow the achievement of high urban density under optimal solar insolation conditions. Finally, the paper discusses the possible application of these