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Conceptual Perimeter Model for Estimating Building Envelope Quantities

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Abstract : Building girth is important in building economics and mostly used in quantities take-off of various cost items. Literature suggests that the use of conceptual quantities can improve the accuracy of cost models. Girth or perimeter of a building can be used to estimate conceptual quantities. Hence, the current paper aims to model the perimeter-area function of buildings shapes for use at the conceptual design stage. A detailed literature review on existing building shape indexes was carried out. An empirical approach was used to study the relationship between area and the shortest length of a four-sided orthogonal polygon. Finally, a mathematical approach was used to establish the observed relationships. The empirical results obtained were in agreement with the mathematical model developed. A new equation termed “conceptual perimeter equation” is proposed. The equation can be used to estimate building envelope quantities such as external wall area, external finishing area and scaffolding area before sketch or detailed drawings are prepared.

Keywords : building envelope, building shape index, conceptual quantities, cost modelling, girth
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