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ANALYSIS OF CO_2 EMISSION BETWEEN CONSTRUCTION SYSTEMS: LIGHT STEEL FRAME AND CONVENTIONAL MASONRY

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Abstract

Since the emission of greenhouse gases is an important environment issue, this paper presents an analysis of CO_2 emission between two different building methodologies: conventional masonry and light steel frame. To this end, a 70m² building project used in Social Brazilian Housing Programs (SBHP) built according to both methods was analyzed. In addition to that, the quantitative materials used were determined, according to the building services (infrastructure, superstructure, closing and cladding, roof and floor) and afterwards, were multiplied by conversion factors. These conversion factors allow estimating the CO_2 emission from the manufacturing process of the material up to its application, which made it possible to determine the total CO_2 emission for both building methodologies. Furthermore, a cost analysis was carried out in order to interpret economic issues in both methods. The results showed that infrastructure and superstructure are the main services responsible for CO_2 emission in both constructive methodologies, due to the high consumption of concrete, steel, coarse aggregates and wood, where differences of almost 90% were identified. Moreover, although the conventional masonry method presented low global cost in comparison with light steel frame, this method emits more than 102% of CO_2 in relation to the latter. Therefore, from an environmental point of view, builders should consider this issue when choosing a construction system.

Key words: civil construction, CO_2, greenhouse gases, lght steel frame, masonry

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