

NEW BUILDING TECHNOLOGIES FOR SUSTAINABLE CONSTRUCTION

ABSTRACT

This thesis embraces the “Sustainability” concept in the construction industry being the logical outcome the development of this industry that faces environmental, social and economical challenges, which enterprises have to consider in the beginning of this century.

This thesis aims at demystifying the “Sustainable Construction” concept. Due to bad examples in the past, that hopefully will not be repeated in the present and future, this concept became almost irremediably associated to construction, in which the prime objective was reducing environmental impact leaving important parameters, like quality, durability and cost behind. This concept has lost and continues to loose credibility due to constant marketing manoeuvres by companies in this sector, that deceivingly associate this concept to their products, in order to, in a fiercely manner, maximise sales and profit.

The construction industry is one of the most important economical sectors in Portugal. Nevertheless, this sector continues to base itself on traditional construction systems and unqualified workers, being characterised by excessive usage of natural and energetic resources. This situation causes great environmental impact with great potentialities to be reduced.

This thesis identifies, in general, the environmental impacts in the construction industry, and particularly, in the building sector. A few measures and examples of new construction technologies and others are also presented, that are the result of technological renewal and improvement of building technologies, some of them, already applied thousands of years ago. The development and application of these technologies aim at a construction, more and more sustainable, that settles evenly on environmental, economical and social domains.

A methodology, that is expected to be adequate to validate the sustainability of construction solutions, is presented at the end. This methodology is then applied to some conventional and non-conventional solutions of pavements and exterior walls. It is hoped that the practices approached, the methodology developed and the results obtained, may serve as a basis for the various construction intervenients, in the decision making process, in accomplishing buildings more sustainable.