

Chapter 7 : Codes and standards on earth construction – a review

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Abstract

Earthen structures provide solutions to build green and sustainable buildings. Any engineered construction needs guidelines on the production of materials, construction of the structural elements, quality control methods and design guidance. There is lack of universally accepted standardisation on the production of earth construction materials and construction methods as compared to the standards available on conventional materials. The paper attempts to review the existing standards and norms on the earth construction, and bring out the need for comprehensive standard codes on earth construction. An analysis of the existing standard codes on earth construction has been provided. There are about 80 standards, but there is lack of coherence among the standards and gobally acceptable terminology. The paper highlights the points needing attention while developing comprehensive globally applicable standards on different types of construction methods.

Keywords: Codes, standards, earth construction, compressed earth, rammed earth, cob, adobe

7.1. Introduction

Earthen structures, especially earthen dwellings assume importance in the context of environment conservation and emission reduction. History of earthen constructions can be traced back to the dawn of civilisation. Earth or soil is a mixture of clay minerals and inert materials such as silt, sand and gravel. In addition, minor quantities of impurities such as organic matter, salts, etc. could be present. The soil characteristics are mainly controlled by the type and quantity of clay minerals present. The clay minerals can be grouped under two broad categories: (a) expansive clays and (b) less-expansive clays (called non-expansive clays). The expansive clays possess high swell-shrink characteristics when compared to the non-expansive clays. Generally, soils with non-expansive clays are used for earth construction. The earth construction finds applications in (a) walls, including wall elements and masonry mortars, (b) floor/roof systems, (c) foundations and (d) renderings and plastering. There are different types of earth construction techniques. The earth construction methods used for the walls can be grouped under (a) monolithic walls and (b) masonry walls.