

CEMENT STABILIZED RAMMED EARTH FOR LOAD BEARING WALLS IN TWO STOREY HOUSE

G.W.T.C. Kandamby

(08/8051)



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Gusseenna Wadu Tesila Chandrakanthi Kandamby

(08/8051)



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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

Use of cement stabilized rammed earth (CSRE) walls is one of the popular method which has been introduced as an alternative walling material for single storey houses. These walls are made with mixture of laterite soil and cement compressed in a steel mould (Slip form) which was introduced by Dr. A.N. S. Kulasinghe. The mould is placed in between two columns erected at junctions of walls made out of cement stabilized compressed bricks (CSEB) which are manufactured as per the newly established Sri Lanka Standards. It was observed that use of CSEB for making wall junctions does not show the good performance as separation cracks appeared vertically along the wall junctions.

The objectives of this research are to examine the adoption of masonry design code of practice British Standard 5628: Part 1-2005 for CSRE walls, investigate the suitability of CSRE wall junctions instead of using CSEB and determine the cost effectiveness of CSRE as a walling material. Design calculations emphasized that the necessity of providing good fixity at wall junctions for the walls on upper floor as it fails due to high winds especially in high wind zone area. Therefore Improvement for the wall junctions is vital to overcome this design and construction issues.

It is found that CSRE can be used for load bearing walls of two storey house by performing the structural design according to the code of practice British Standard 5628: Part 1-2005 as necessary engineering strength parameters are available for local soils. This research has introduced CSRE wall junctions made in timber mould to overcome the said issues. Experimental programme was carried out by casting "T" and "L" wall panels with CSRE using timber mould and found that CSRE can be applied for building wall junctions satisfactorily. Because of this developed method, making walls is simplified and leading to the reduction of construction cost to a considerable amount so that this technology can be applied satisfactorily in any part of the island. Application of CSRE for making load bearing walls in two storey houses is a good alternative technology for Sri Lanka today as it fulfills design, construction and economical aspects in housing. Further study is necessary to examine the behavior of CSRE wall junctions with CSRE wall together in a wall for full scale testing.

DEDICATION

To My Husband and Son

For their continuous dedication and encouragement for all the endeavors towards
my achievement



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