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REINFORCED BRICK DESIGN

IN ACCORDANCE TO BS 5628

by

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ABSTRACT

The work presented in this thesis is focused on the design in reinforced brick. Although brick have popularly been used in construction, the usage are just a mere cladding or housing materials and not as high structural potential. Brickwork just like concrete can be reinforced to carry the tensile stresses to eliminate the weakness in tension.

The structural components that involved in this thesis are beam, wall, ie. quetta bond wall and grouted cavity wall and column. Computer program was written using C language, to facilitate the user in obtaining the result in a short duration of time. The outline of the design are based on BS 5628 and W.G. Curtin et al.

The analysis of beam was subjected to pure bending members where the section of the beam and the required reinforcement bar are simulated from the characteristics loading given.

Quetta bond wall design analysis is based solely on axially loaded members and the design will provide the size of reinforcement bar to suit into the standard quetta bond vertical grouted duct.

Grouted cavity wall is a double leaf wall separated with a grouted cavity layer that embedded the steel reinforcement bar. The analysis involved are based on:-

1.0 GENERAL

The principles and application of limit state design philosophy, as applied to unreinforced brick, should be well known to those who have used BS 5628: Part 1. The same basic principles can be applied to reinforced brick. It is particularly important to consider reinforced brick as being plain brick with additional of reinforcement, rather than as reinforced concrete in which the concrete is replaced by brickwork.

In the limit state design reinforced brick, only two partial safety factors for materials are used, 2.0 and 2.3. The nature of the work is such that normal construction control is considered to be totally in adequate.

The basic principle of the design philosophy is that, under the most burdensome loading conditions, the various design strengths of the materials comprising a particular element should not exceeded. In addition, the element must remain serviceable, i.e. not have excessive deflection. As applied to reinforced brick, this generally means sections are analysed for the ultimate state of collapse, and are checked against various rule-of-thumb guidelines to ensure that deflections are acceptable and the durability is satisfactory.

The objective of the analysis is to ensure that the design strength is equal to or greater than stresses imposed by the design load.