Foundations for Low-Cost Houses

author: J. Eygelaar, senior research fellow
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FOUNDATIONS FOR LOW-COST HOUSES

Introduction

The Building Code of Kenya lays down the following general rules for foundations of buildings:

- The foundations of every building shall be:

  (a) so designed and constructed as to sustain the combined dead load of the building and imposed vertical and lateral loads and to transmit these loads to the ground in such a manner that the pressure on the ground shall not cause such settlements as may impair the stability of the building, or of adjoining works or structures; and

  (b) taken down to such a depth or be so designed and constructed as to safeguard the building against damage by swelling, shrinking or erosion of the sub-soil.

The most common foundation type for simple buildings generally applied in Kenya is the unreinforced concrete strip foundation, and the Building Code (Grade I By-laws) specifies minimum thicknesses and widths of this type of foundation for various loading and sub-soil conditions.

The respective tables:

Table I - Bearing capacity of subsoils, and
Table 2 - Minimum widths of foundations
are reproduced in Appendices A and B of this paper.
Metric equivalents (in SI units) have been added to the data given in imperial units in the Code.

The Grade II By-laws contain only one clause (By-law 18) dealing with foundations, which reads:

- Foundations shall be adequate to support the load transmitted to them and be generally to the satisfaction of the council.

(1) Building Code of Kenya (Grade I) - By-law 43.(1)
(2) Building Code of Kenya (Grade I) - By-law 44.(1).(b)
For simple single-storey houses with 6" thick external walls (140 mm. thick when metric blocks are used) the most generally adopted concrete strip dimensions are:

width 18" thickness 6"

which for walls in 140 mm. thick metric block masonry would be converted to:

width 440 mm. thickness 150 mm.

For low-cost houses constructed by the National Housing Corporation, foundation strips are normally:

width 12" thickness 4"

(metric equivalent: 300 x 100 mm.)

These dimensions are in conformity with the Building By-laws provided the bearing capacity of the sub-soil is not less than 3/4 ton/sq.ft. (80 KN/sq.m.), a condition which is fulfilled by normal red soil.

(3) See Table 2, Appendix B of this paper

(3a) Stresses expressed in KN/sq.m. (Kilo Newton per square metre); 1 KN = 1000 Newton; for all practical purposes the Newton (unit of force in the SI system) equals 0.1 kgf.

(4) See Table 1, Appendix A of this paper
Required width of foundations of simple single-storey houses

In a typical low-cost house as shown in the illustrations, the wall exerting the maximum load on the foundations is the party wall separating the semi-detached pair of houses.

Plan
scale 1/200

Perspective section

(5) House type A - Kibera experimental self-help scheme