

STEPPED FOUNDATIONS FOR SLOPING SITES

Foundations must be horizontal irrespective of the character of the site. If a site has little or no fall, the foundations of walls of the same thickness are generally level throughout. On a sloping site, however, it would be uneconomical to construct all foundations at the same level as that of the lowest, and it is therefore the practice on such a site to arrange the foundations at different levels according to the slope. Such are known as stepped foundations. The steps should be in relatively short lengths and preferably of uniform height not exceeding 3-ft., the smaller the better. Hence when the slope is considerable, it is desirable to form the foundation of a wall of appreciable length in a series of small steps; if the steps are high owing to their inadequate number, there is a risk of unequal settlement occurring due to the large variation in the loads transmitted to the foundation on each side of a benching (see below) and the difference in shrinkage of the mortar joints between the larger number below each benching and those above; this may cause cracks to appear in the wall immediately over the changes of depth. The lengths of the steps need not be uniform, and they may vary considerably if the fall is very irregular.

Two typical arrangements of stepped foundations are shown at A and B, Fig. 22.

The site at A has a fairly regular slope, with a total difference in level in the length of the wall of 4-ft. The two steps are of uniform height. The sketch detail C shows the concrete continued vertically from the lower to the upper concrete beds. This is known as a *benching* and should be of a width at least equal to the thickness of the concrete bed. In this example the floor level is the same throughout.

The sectional elevation at B shows the ground to have an irregular fall, the total difference in level being 7-ft. Advantage has been taken of the fall to obtain garage accommodation as shown; a building should be designed to obtain accommodation in this manner in order to reduce the cost and avoid "dead walling" at the lower level. The foundation consists of brick footings on concrete as an alternative to that at A. The detail at D shows the footings (and wall) of the lower section abutting against the concrete benching, and those above it returned, the lowest course of footings being 6-in. from the edge of the benching.

SITE CONCRETE.—This has not been shown in order to avoid complication. No attempt would be made to arrange this in a series of level steps; the top 6-in. of virgin soil would be removed and the 6-in. of site concrete would be formed to a slope more or less conforming to that of the ground. The floor of the garage at B would be of concrete. The site concrete under the floor on the left of the division wall could be laid to fall as described above, in which case the division wall would require a vertical damp proof course; alternatively the latter can be dispensed with if the earth is excavated to a depth of 9-in. below

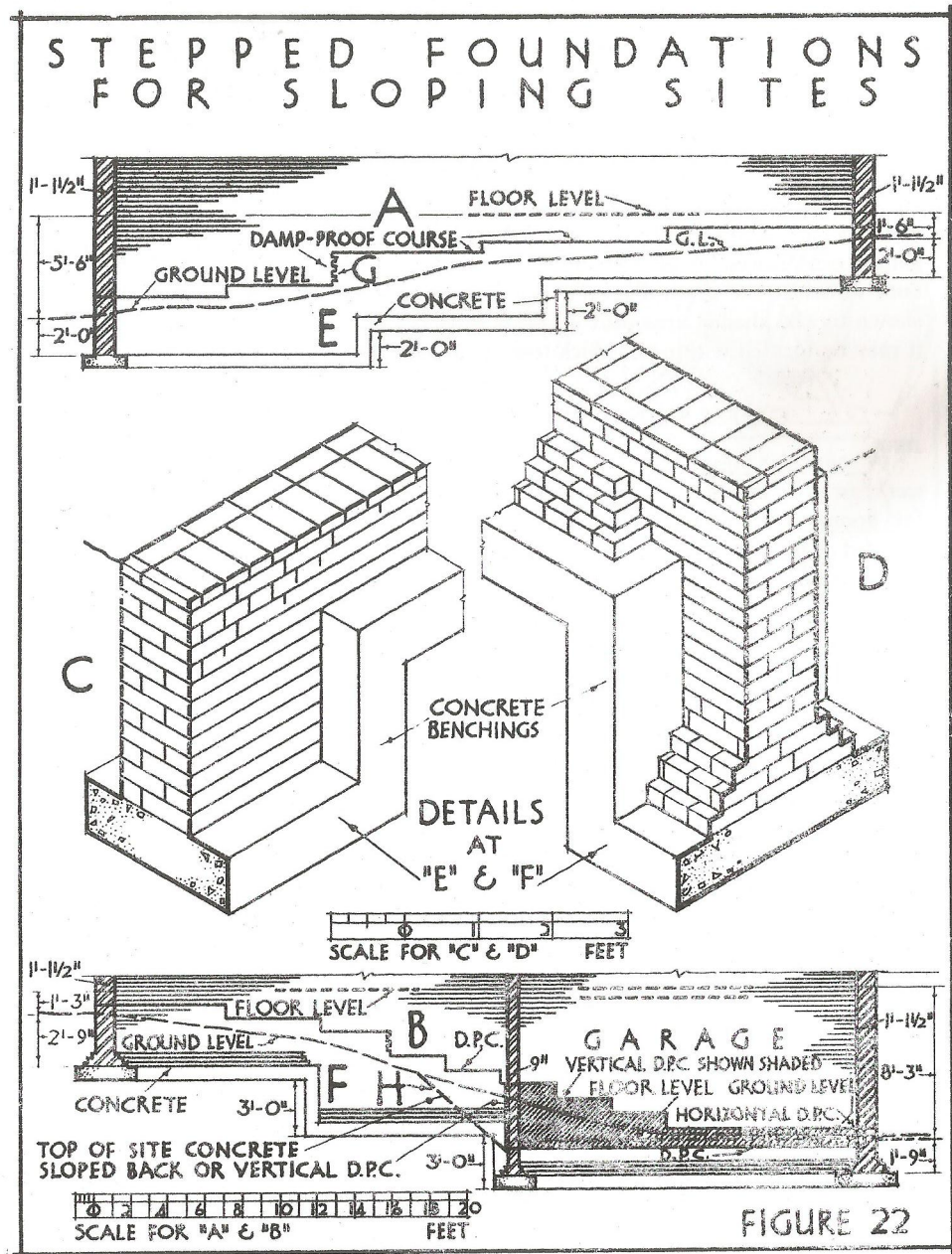


FIGURE 22