CONSTRUCTION AND MATERIALS

The last of four articles by JOHN G. SOWERBY, A.R.I.B.A., A.I.L.A.

IN this article I will consider construction. The subject will be discussed from the viewpoint of the prospective owner, and the main items to be considered will be the type of construction to be adopted, and the selection of the materials to be used. Building costs vary throughout the Dominion; and all prices should therefore be regarded as approximate only.

Let us first discuss foundations to the external walls. It is well known that a continuous concrete base wall is more expensive than a concrete pile foundation; but in spite of this, the former is more popular. For a three-bedroom house on a level site, the difference in cost is at least £75; but on a sloping site the figure could easily be more than doubled. A concrete pile foundation is completely satisfactory, except in termite areas or on ground of very poor bearing capacity, and will last as long as the remainder of the house. It is therefore difficult to see how the additional expenditure on a continuous concrete base wall is justified. Another alternative is to have concrete base walls at the corners only, and piles elsewhere. This achieves a saving of about half the amount previously mentioned.

On level sections, or ones which can easily be bulldozed, a considerable saving can be made by the use of a concrete floor. Although these floors are not very popular at the present time in New Zealand, the judges in the Housing Competition were of the opinion that their use will eventually become more common. Concrete floors are used extensively for housing overseas. In England, owing to the shortage of timber, all ground floors of two-storey houses must now be concrete. In the United States, where there is no such compulsion, concrete floors are used almost as much as timber ones, and are rapidly becoming more popular.

The main advantage of a concrete floor is the elimination of all concrete piles, base walls, floor framing, steps and suspended porch floors. Dampness is entirely prevented if the floor is properly constructed with a waterproof membrane of bitumen or a similar material. On a level site, a three-bedroom house with continuous concrete foundations and a timber floor would cost almost £200 more than one with a concrete floor. In the case of a house with pile foundations this saving would be reduced by about £75. The appearance of a concrete floor is inferior to a wood finish, and floor coverings to the whole area are necessary. This will affect the final comparative costs of the two materials.

In order to achieve economy in external wall construction, the amount of framing timber must be reduced. Many low cost house designs have achieved this by sheathing the walls with vertical boarding in place of the normal horizontal weatherboards. If this is done, the studs (the vertical framing members) can be spaced three feet apart, which is double the distance permitted when horizontal weatherboards are used. This practice is permitted under the Standard Code of Building By-laws which have been adopted by all local authorities except the ultra-conservative ones.

There are several materials in common use for sheathing or finishing the external walls, and the costs of these vary considerably. A weatherboard finish is most frequently used, but this is by no means the least expensive. The cheapest material is flat asbestos cement sheeting, which for an average three-bedroom house is about £120 cheaper than weatherboards. The main disadvantage of flat asbestos is its appearance, which is somewhat drab; but this can be rectified at slightly increased cost by painting. Plastic paints, which can easily be applied by the owner, are very suitable. Alternatively, one wall of the house can be sheathed with weatherboards painted a bright colour, to relieve the otherwise lifeless effect.

Asbestos cement sidings are becoming fairly popular, and are much superior to flat asbestos. They are nevertheless still somewhat dull in colour, but much can be done to avoid this by using bright colours on the doors and other woodwork, and by using a roof of contrasting colour. For a three-bedroom house asbestos cement sidings are about £50 or so cheaper than weatherboards. They are completely borer-proof, and as no painting is necessary they cost less to maintain than weatherboards.

Another popular alternative to weatherboards is a plastered finish, sometimes known as roughcast or stucco. This is normally applied to a backing of cement wallboard, of which there are several proprietary brands on the market. With this backing a plastered finish costs roughly the same as weatherboards. A somewhat cheaper alternative is to apply the plaster to galvanised wire mesh and heavy quality waterproofed building paper. This method is about £30 or so cheaper for a three-bedroom house. One disadvantage of stucco is that the standard by-laws require all walls finished with this material to have continuous concrete foundations. A saving in cost cannot therefore be made by using pile foundations.

Brick veneer is a further alternative to weatherboards. This material has a good appearance and requires almost no maintenance, but costs at least £50 more than weatherboards for a three-bedroom house. There are also several different types of concrete blocks used for wall construction, most of which are more expensive than brick veneer. All these materials require continuous foundations.

Although weatherboards are normally painted, a satisfactory and cheaper finish is creosote. Rough-sawn weatherboards, if available, are cheaper than dressed.

As a roof covering, the majority of competitors in the Government Housing Competition selected corrugated asbestos, corrugated aluminium or corrugated galvanised iron. These materials are all suitable for roofs of fairly low pitch, and require considerably less roof framing timber than a tiled roof. Of the three corrugated materials mentioned, galvanised iron—assuming it is painted later by the owner—is the cheapest, although the difference in cost is not great. All three materials are considerably cheaper than a tiled roof, and for a three-bedroom house with level ceilings and a simple hipped or gabled roof the difference in cost would be at least £50, but probably more. This assumes that the roofing sheets are fixed to battens.

For flat roofs, the only reasonably priced material available in New Zealand is bituminised felt or "fabric." This is no cheaper than tiling, and may be more expensive, depending upon the number of layers of felt used.

With a roof of low pitch, a further saving can be made by fixing the ceiling lining directly to the underside of the rafters, and having a sloping ceiling following the roof shape. This eliminates all normal ceiling framing and, because of the additional average height, increases the apparent size of the house, particularly if an "open plan" is used. For this type of construction a simple gabled roof is most convenient.

Still another saving with this type of ceiling can be made by constructing the whole roof of two-inch thick boarding, tongued and grooved together, spanning directly between the main supports, without either rafters or ceiling joists. This eliminates all normal roof and ceiling framing and saves much labour. In addition, no ceiling linings are necessary, as the boarding is a finished surface, which can be directly painted, oiled, varnished, or otherwise decorated as desired. The roof covering of corrugated sheet material or fabric is fixed directly to the boarding. This type of construction is common in America, where it is often known as a plank roof.

With a sloping ceiling, most local authorities will approve a room height in which the average, rather than the minimum, is eight feet. This means that if the storey height is nine feet under the ridge, it need only be seven feet at the eaves. Thus the height of the external walls on two sides of the house is reduced by about one foot, which, of course, reduces their area and cost.

Windows are expensive items. A saving in cost can be made by using adjustable louvres for ventilation purposes, and glazing all fixed lights directly into simplified frames. Sashes are thus entirely eliminated. This arrangement is suitable for all except very exposed localities. As an alternative, the louvres could be replaced by normal sashes and the fixed lights glazed directly into the frames.

Internally, as is well known, the owner can make a considerable saving by carrying out some of the painting himself. However, he should be reasonably skilful with the brush and familiar with the treatment necessary for various types of surfaces.

The final plan in this series is for a compact two-bedroom house of about 720 square feet. As with previous designs, the clothes-washing facilities are incorporated in the kitchen.