Building a Concrete Residence On Hillside

BY A. MORGAN SMITH*

At the present time concrete seems to be the practical building material for nearly every requirement of building construction; further, it has developed new types of construction which are impossible with other building material. The materials required for making concrete are generally available the country over, and the ease with which concrete can be cast into any conceivable shape right on the job makes it a building material of many advantages. The development of the concrete residence is in the mind of every progressive home builder who demands safe, durable, fireproof construction with the least up-keep cost.

Concrete architecture is a specialty with me. I have found the monolithic concrete residence the most interesting to develop, because in a residence the owner who wishes to exercise individuality either in appearance, utility or durability can very easily have his ideas worked out.

The illustration and floor plans show the concrete residence built for Dr. Herman S. Davis, Pittsburgh, in the summer of 1912. Dr. Davis is a consulting engineer and astronomer, and well qualified to choose the kind of material for his own home.

The building, on a hillside, is well located for convenience in making and placing the concrete. A small power batch mixer was placed about 100 ft. to the rear and 60 ft. above the building site. A permanent chute was built from the mixer down the hill side, and at the lower end a movable trough distributed the concrete where wanted.

The concrete work progressed as follows: Forms for the cellar walls,

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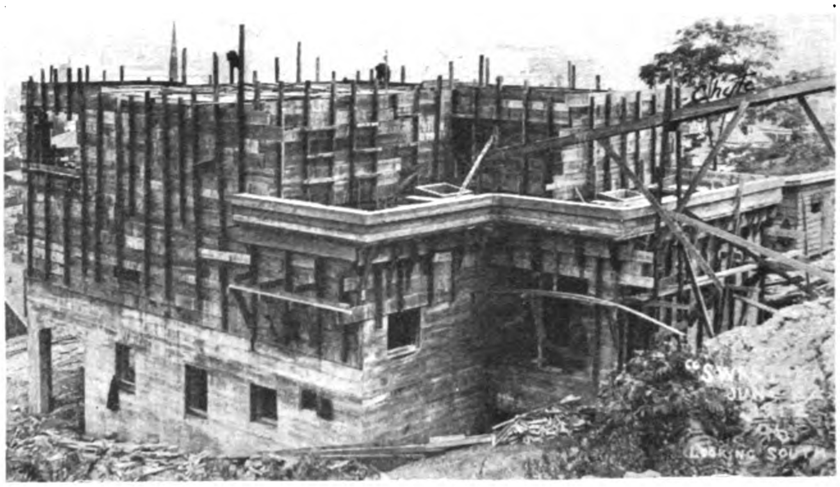

FIG. 1—A CONCRETE RESIDENCE NEARING COMPLETION

This view shows the wall centering in detail, and the home-made chute coming down the hillside from the right. Note how the sheathing boards are not cut at the corners but extend beyond. The rear window of the bedroom, shown in the center of the view, illustrates the difficulty of always getting the concrete to flow under window frames when running walls. The surface of the walls shown here, which so far are untreated, indicates careful grading of materials and spading

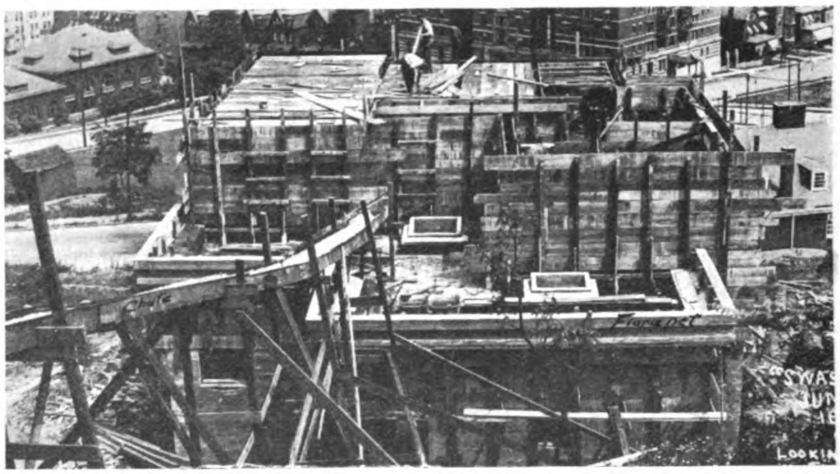

FIG. 2—PLACING THE CENTERING FOR THE ROOF

In the extreme right hand corner, the joists are placed, and the sheathing is being set over the central rooms. The concrete chute comes down from the left in this view. The sheathing extending beyond the corners is shown at the right

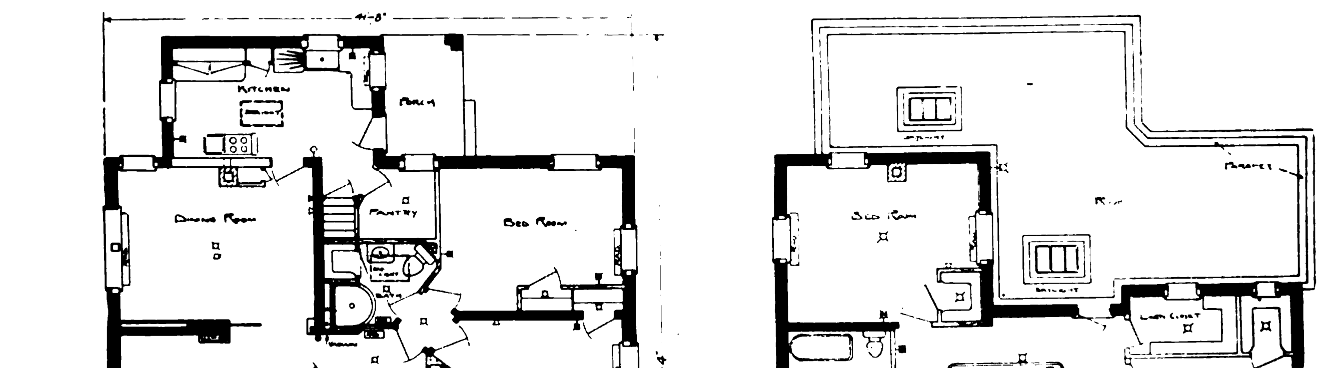

FIG. 3—FIRST AND SECOND FLOOR PLANS OF A CONCRETE RESIDENCE IN PITTSBURGH

partitions and floor slab for first floor were built and the concrete poured. Then the second story followed in like manner and so on till completed. Openings were left in the floor slabs and the walls for piping, wiring, etc. The

FIG. 4—GENERAL VIEW SHOWING THE LOCATION OF THE DAVIS RESIDENCE

The alley at the rear, and the position of the mixer plant at the rear are shown

window and door frames were all set in the forms.

The roof is of reinforced concrete with a slope of ¼" to the foot, draining into 2-in. brass pipe conductors. There is no flashing on the roof except around the vent pipes, which means a roof that really improves with age. No waterproofing compound was used.

The three-section laundry tubs and shower receptor are cast concrete. In the cellar a concrete rain-water tank of about 150-gals. capacity supplies water by gravity to the laundry tray.

The beams are reinforced with rods and the floor slabs, figured to carry a 75-lb. live load are reinforced with woven wire. The inner side of the outer walls are furred, allowing a 1-in. dead air space; and the floor slabs are overlaid with wool sleepers to which the finished floor is nailed. The space between the floor and the concrete slab is convenient for wiring and pipes. For the walls and partitions a 1:3:6 mix was used; for beams and slabs a 1:2:4 mix.

With the flat roof construction the skylight makes many new features possible. In this residence the bath room on the first floor has no outside walls for windows; the skylight lets in a flood of light and ventilation is easy to regulate. The skylight over the kitchen offers many advantages, and the one over the second floor hall lights up that part of the house, which in most houses is dark and dreary in the day time.

The guard around the front porch roof is called a "florapet," that is, it is troughed out for filling with earth and planting flowers. From this has originated the name "florapet."

This winter, when the outside temperature was zero, the inside rooms were 70° with a boiler temperature of 140°.

Contemplated additions to the plant of the Atlantic & Gulf Portland Cement Co., Ragland, Ala., are planned, increasing the daily capacity of the plant to 2,000 bbls. The improvements will cost about $50,000.

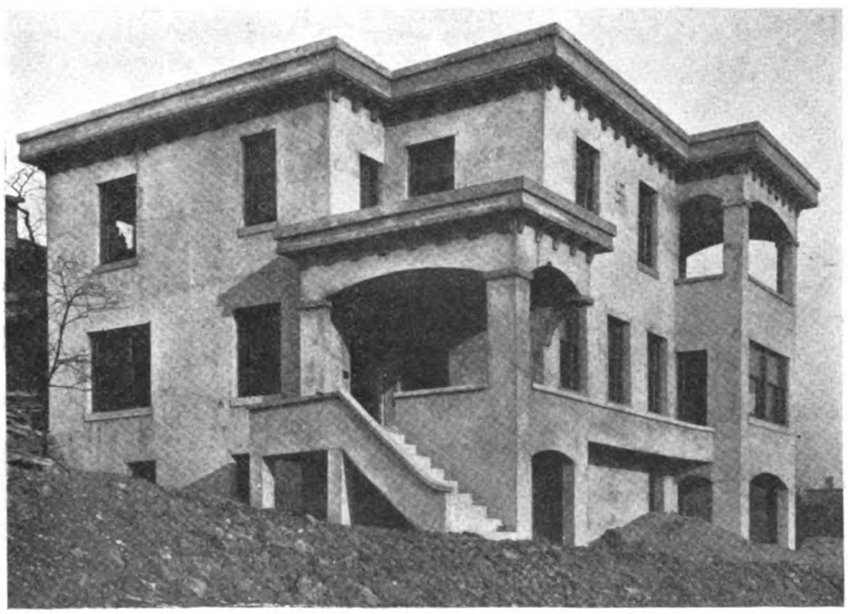

FIG. 5—THE FINISHED CONCRETE RESIDENCE

Note the simple cornice detail used

Double Concrete Walls with Tile Columns

In building fireproof houses at Richmond Hills, L. I., or Kew Gardens, as it is called, Gurden S. Mumford, a New York architect, has developed and used a system of wall construction presenting several new and unusual features. Hollow tile are used to build wall columns; these are reinforced with concrete and steel, and between the columns is cast a double concrete wall. In this system, hollow tile are used in a most economical form as isolated columns, in through-bonding and in

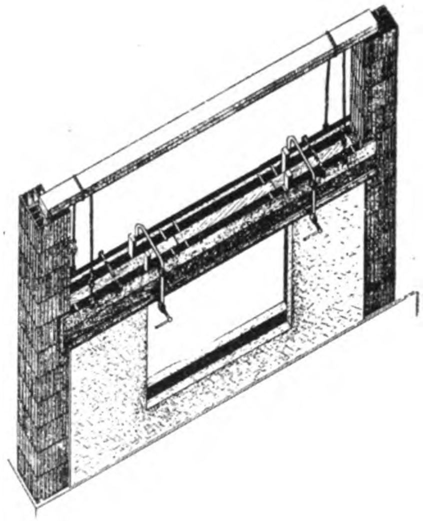

FIG. 1—ISOMETRIC VIEW SHOWING THE ARRANGEMENT OF DOUBLE WALL FORMS AND SUPPORTING COLUMNS

partitions, where strength, lightness and temperature insulating qualities are required. The floor and wall weights are carried mainly by the reinforced tile columns, transmitting the load to them by means of reinforced girders.

These concrete and tile columns are tied together with wall girders at the floor line, and at the roof plate, which in turn carry the floor construction.

The "Unit" Form: The form used consists of two planks 2" wide, 14" deep, and 16' long, with a 3-in. slightly tapered plank of the same depth, in three sections of about 5 ft. each, placed between these outside pieces and used as a core to make the hollow wall. At each end, are short wedge-shaped pieces. Each section of the 3-in. plank or core mold is held in position by angle irons which rest on the top of the two outer planks and abut against an iron plate secured to the outside pieces. The whole is so arranged as to be securely clamped together top and bottom. A turnbuckle clamp at either end unifies the two outer planks and permits a positive movement outward when necessary. At each end of the two outside planks an iron strap or casting is fastened to the iron plate already mentioned, which allows a rope to be passed from them to the planks overhead, for support if it is desirable for the form to stay in place for any time. A simple tackle permits the