

# Recent Developments in Concrete Kiosk Construction

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CONCRETE was first used by the Post Office as the material for constructing Telephone Kiosks when, in 1920, the Kiosk No. 1 was introduced. As a structure, this kiosk gave every satisfaction, and paved the way to the continued use of concrete in later designs. From an appearance point of view, however, it left much to be desired, and this feature led to the receipt of numerous requests from local authorities for designs more suited to local architecture. It was obvious that, on economic grounds, all these requests could not be met, and the Post Office invited Sir Giles Gilbert Scott, R.A., to prepare a design which could be standardised. The design of the Kiosk No. 3 which the architect prepared, and which is illustrated on the left of Fig. 1, followed closely the lines of the existing iron Kiosk No. 2, and a more imposing structure would have been difficult to imagine. The

fact that thousands of these kiosks are now erected in settings varying from the wooded lanes of the countryside to the heart of a busy city, shows how Sir Giles, in a masterly way, fashioned a kiosk in keeping with the dignity of the Post Office and which could be erected anywhere without drawing complaint from local authorities.

### *The original Kiosk No. 3 design.*

The kiosk consists of seven separate concrete sections, viz., two side sections, one back section, till, floor slab, dome, and a transom section, with a Columbian pine door hung in a steel door frame (see Fig. 2). The two sides and the door are glazed, and the transom section provides for four opal glass TELEPHONE signs. The sides and back are screwed together, the door frame is fixed to the sides with nuts and bolts, while the transom section with its associated steel frame adds much to the rigidity of the structure.

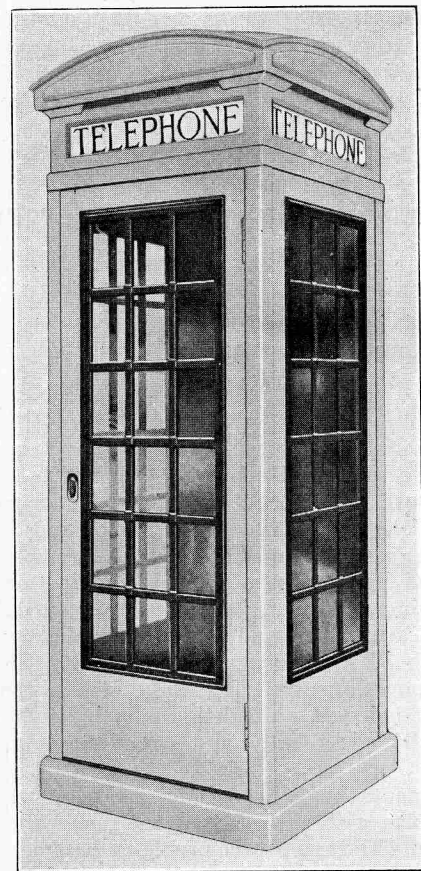
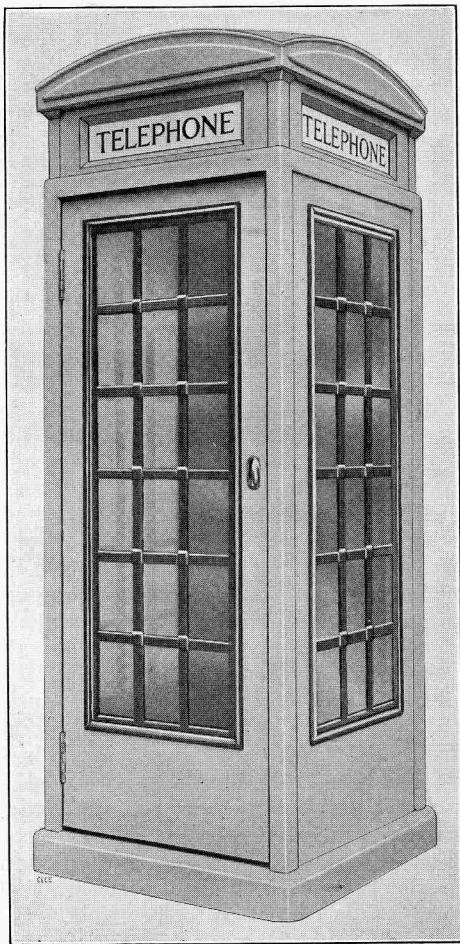
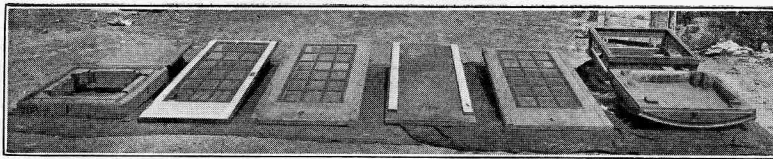


FIG. 1.—OLD AND NEW TYPES OF KIOSK NO. 3.



FLOOR SLAB  
CILL DOOR SIDE PANEL BACK SIDE PANEL TRANSOM  
DOME ROOF

FIG. 2.—SECTIONS OF OLD TYPE KIOSK.

The concrete used consists of an approved aggregate, graded into coarse and fine, with aluminous cement. The coarse aggregate varies between  $\frac{1}{4}$ " to  $\frac{1}{8}$ ", while the fine aggregate consists of clean, sharp washed sand  $\frac{1}{8}$ " down. Not more than 5% of the fine aggregate must pass the 100-mesh sieve when subjected to the test laid down by the British Standards Institution. The concrete is mixed in the following proportions:—Cement 100 lb., fine aggregate  $1\frac{3}{4}$  cubic feet, and coarse aggregate 3 cubic feet.

One of the most pleasing features of this kiosk is the finish, which is Clipsham stone colour with all the steelwork painted Post Office red. In the first instance, Portland Cement was used, but it was found impossible to obtain a suitable material, giving this specified finish, which would adhere or maintain a reasonably good appearance. It was because of this fact that aluminous cement was adopted, and to offset the disadvantage of the extra cost, there is the advantage that kiosks can be produced at three times the rate as with Portland cement. The aluminous cement coatings are treated with an oil-bound paint and lightly stippled. This paint, which is quick drying, is found to adhere to the concrete remarkably well.

Since the first contracts, in 1928, manufacturing difficulties have arisen from time to time, with resultant weaknesses in the castings and, while every effort was made to combat these difficulties, it was finally decided that the only satisfactory method of obtaining better castings was to make certain changes in structural design, and in the method of assembly. Against this, it had to be borne in mind that any change in outward appearance must be avoided as far as possible for two important reasons:—

- (1) The fact that the kiosk was prepared to the design of an eminent architect has proved an invaluable lever to the Post Office in dealing with local authorities.
- (2) The public are now thoroughly familiar with the appearance of a telephone kiosk.

Any changes that were made, therefore, should be such that external appearance should be almost unaffected.

#### *Manufacturing difficulties and their cure.*

Fig. 3 shows the transom section. It will be clearly seen from this illustration that the section is built up of a number of delicate members. The

mould for this casting is necessarily complicated and difficult to fill with concrete of a consistency which will produce reasonable strength. Even with considerable vibration of the mould and "rodding" of the concrete, it is almost impossible to remove trapped air.

In pre-cast concrete work, it is an advantage if moulds are open and flat on the top surface so that they can easily be filled and "vibrated" and the concrete "struck off."

With this in mind, it was decided to split up the transom section into four parts, casting three of these parts integral with the sides and the back, and letting the fourth side form a small panel to fix over the door frame. In doing this, two slight alterations to appearance were introduced. By splitting the section into four, surface joints were exposed on two sides, at points where they were most noticeable. Sir Giles Scott, in his design, had cleverly masked all joints by the shadow produced by a pilaster, and the same procedure was followed here by introducing pilasters on the corners at the top of the extended sides.

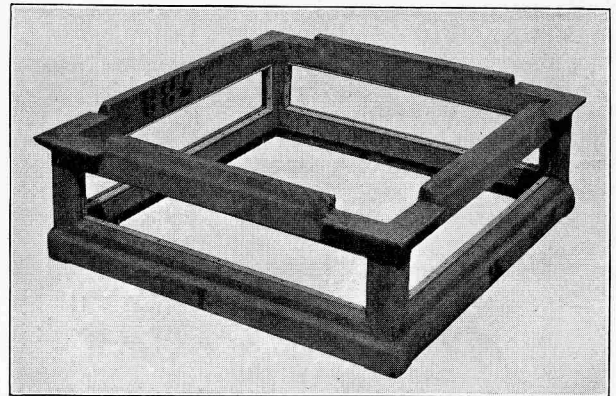


FIG. 3.—TRANSOM SECTION.

The second alteration resulted from the fact that, to produce a large enough section to give adequate strength, it was necessary to reduce the length of the TELEPHONE signs by  $5\frac{1}{4}$ ".

Reference to Fig. 4 (a) will show that pilasters were cast on both sides of the side sections of the kiosk. To do this it was necessary to build up the shaded portion above the striking off surface of the mould with consequent difficulty in obtaining adhe-

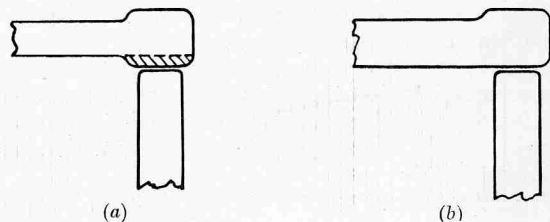
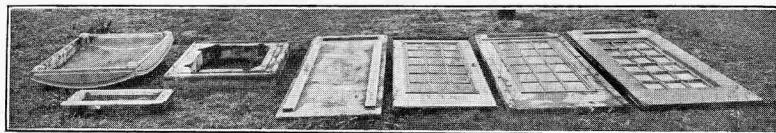


FIG. 4.—DETAIL OF PILASTERS.

sion. Structurally, the pilaster on the inside of the section serves no useful purpose and, as shown at Fig. 4 (b) it can be eliminated without altering the external appearance.

*The new Kiosk No. 3 design.*

Combining these two modifications, a kiosk can be produced, still consisting of seven separate concrete sections, but such that six of these sections can be cast in flat, open moulds. These sections (with the exception of the floor slab) are shown separately in Fig. 5, and the assembled kiosk is shown on the right of Fig. 1.



DOME ROOF    CILL    BACK    DOOR    SIDE PANEL (OUTSIDE (UPPERMOST))    SIDE PANEL (INSIDE (UPPERMOST))  
 TRANSOM PANEL

FIG. 5.—SECTIONS OF NEW TYPE KIOSK.

*Difficulties due to other causes.*

During the hot weather in the midsummer months, reports were received from a number of contractors that kiosks, after assembly and while awaiting inspection by the Department's inspecting officer, cracked under the influence of the sun. In examining this problem, it must be borne in mind

that the Department specifies rapid hardening aluminous cement, the behaviour of which is appreciably different from that of Portland cement. With a rapid hardening cement, very great care has to be taken to ensure that there should be sufficient water present during the setting process to produce complete hydration of the cement. If the kiosks are exposed to the sun, some of the water may evaporate and there will be insufficient water to bring about complete hydration, with consequent cracking of the castings. To overcome this, the moulds, when filled, are covered with wet sacking for a period of 24 hours, and a clause to this effect has been added to the specification. At the end of this time, the castings are ready for handling.

It was found that in many cases, the cracking of the concrete sections took place at those points where wooden plugs were inserted to enable the sections of the kiosk to be screwed together. The wood, in contact with the wet concrete, swelled appreciably and produced a bursting action. Wooden plugs have been replaced on the new design by metal inserts.

Before the new design was finally standardized, Sir Giles Scott was invited to inspect two kiosks incorporating the modifications. In expressing his approval, Sir Giles stated that, in his opinion, those few alterations which had been introduced, made the appearance of the kiosks more suitable for a structure constructed in concrete.