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"LISTONE" PRESTRESSED CONCRETE-PANEL HOUSE
- preliminary report on design possibilities

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1. This type of prefabricated house is manufactured by Concrete Pipes & Products Ltd., P.O.Box 6724, Nairobi.
Location examples: Two units erected on plots nos. 6450 and 6451 on the Otiende Estate, Langata Road, Nairobi, in 1964 as part of the selfhelp scheme, and units erected adjacent to the Kariobangi Site and Service Scheme, Outer Ring Road, Nairobi, in 1969 by the Nairobi City Council.

2. The building system

The system consists of precast prestressed vibrated concrete panels 2'8¼" wide x 7'6" high x 1" thick with an 8" wide strip down the centre 1½" thick. There is a 4" x 1" flange on each of the two long edges to enable panels to be bolted together, this being done with 3 nos 5/16" diameter bolts.
Special panels with one flange 4" x4" are made for use ar corners and at junctions with cross walls, but cross walls may also be bolted to the 1½" thick centre strip of the panels. Half panels, 1'2" wide are also made.

Windows may be cast into the panels during manufacture, in which case an integrate concrete cill is formed. Doorways are formed by omitting a panel and substituting a doorframe 2'8¼" overall width. A small concrete panel is made to fill in the space above the head of the doorframe if required.

The foundations consist of a 6" x 8" x 2" prestressed precast concrete angle ring beam made in lengths up to 27'0". If the site is reasonably level and the strength of the soil adequate the only foundation required is this ring beam laid on the levelled ground.

The roof is constructed with either 1½" thick prestressed precast concrete solid spandril panels supporting the purlins or welded steel trusses of 1½ x 1½" x 1/8" angle, the panels or trusses being secured to bolts cast into the top of the 4" x 4" flanges on the panels at wall junctions. Steel trusses were used on the Otiende Estate the gable ends being filled with galvanized corrugated iron sheets and the spaces between the roof and the tops of internal cross walls with flat galvanized sheets. Galvanized pipes were used for purlins and the roof is corrugated asbestos cement sheeting.

3. Programming

It is anticipated that transportation costs will confine the possible market to the area in and ground Nairobi where the manufacturing plant is located.

Cathegories of housing to which the system will be feasable are, ex:

A: STAFF HOUSING:
Housing for government staff or the staff of private firms.
Ex.: Dwellings in connection with schools or larger enterprises outside town. Dwelling types corresponding to M.O.W., grades 8 and 9.

B: COMPLETED URBAN HOUSING:
Dwellings for the low-income groups in high density areas inside town.

C: SITE & SERVICE SCHEMES:
Service units.

It is suggested that 3 prototypes are developed initially:

Type 1: 3-roomed, semidetached family dwelling for low-density areas. (staff housing) Plinth area: ca. 45 sqm.

Type 2: 3-roomed, terraced family dwelling with lodger. Low-frontage unit for high-density areas. Possibility for the sub-letting of one room. Plinth area: ca. 45 sq.m.

Type 3: 4-roomed, terraced lodging type for high-density areas. Rooms with separate access. Possibility for initial sharing by more families as well as for normal use by one family. Plinth area: ca. 55 sqm.

4. Planning

The 3 prototypes should comply with By-laws for Scheduled Special Areas and be furnished with kitchen plus wc and shower in separate compartments. Wc should be accessible from inside the house or from a protected courtyard.
Circulation systems should be based on corridors with external access or on courtyards. (In type 1, though, room-circulation or central corridor circulation (corridor without external access) may be sufficient due to the absence of subletting)
It is recommended that minor habitable rooms are made somewhat larger than required in the by-laws (7.4 sqm. for two persons) A room area of 8 to 9 sqm. give better furnishing possibilities for a two person household, if sublet, and may, if room dimensions are related to bed-dimensions, accommodate 3 beds in a family dwelling, thus assisting the family in maintaining the main room as a sitting/dining room. Main rooms should be designed, for the alternative accommodation of at least 3 beds.

5. Design and construction

In the following sections, 6 to 11, some points of view are expressed with regard to the design of the building system in relation to the planning for low cost housing.
Measurements are given in metric units.

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