2.5 LARGE PANEL SYSTEMS

Large panel structure

All the main part of a building, including exterior wall and interior wall, floor slab, roofs, and staircase, may be made up from large panel structure are used in two main design schemes, frame-panel and panel building. In frame-panel building, all the base loads are borne by the building's frame, and as enclosure element. Frameless buildings are assembled from panels that perform the load bearing and enclosing functions simultaneously.

1. Large panel structure for Exterior wall
2. Large panel structure for Interior wall.
3. Large panel structure for floor slab
4. Large panel structure for Roof element.

1.Large panel structure for Exterior wall

Large panel structure for exterior walls consist of panel one or two stories in height and one or two rooms in width. The panel may be blind (without openings) or with window or door openings.

In terms of design, the wall panels may be single layer (solid) and multilayer(sand witch) Solid panels are manufactured from materials that have insulating properties and at the same time can perform supporting functions for example, light weight concrete, cellular concrete, and hollow ceramic stone.

Sandwich wall panels are made with two or three layers: their thickness depends On the climate conditions of the regions and the physic technical properties of the materials used for the insulating layer and for the exterior layer.

The surface of exterior wall panels is covered with decorative mortar or is faced with ceramic or other finishing tiles.

After assembly, the joints between panel are filled with mortar or with lightweight or ordinary concrete and then sealed with packing and special mastics.

2. Large panel structure for Interior walls

The large panel structure of interior walls may be non load bearing or load bearing.

In the first case, they are made from gypsum slag concrete or from other materials that act as enclosures. In the case of load bearing structure, the wall panels, which combine enclosing and load bearing function, are made from heavy or lightweight, silicate or cellular concrete, or vibration set brick or ceramic work.

The dimensions of the panels are determined by the dimensions of the rooms (in apartment houses), their height is equal to the height of a story, the width is equal to the depth or width of a room, and the thickness of the walls between rooms is usually 10-14 cm(between apartment 14-18 cm)

3. Large panel structure for floor slab:

• The large panel structure of floor slabs are usually made from reinforced concrete, the area of the floor slabs in apartment buildings usually equals the area of one room and be as great as 30 sq.m.

• Flagging panels have an area of 5-8 sq m. The large panel floor slabs of housing public, and administrative building are of both the solid and sandwich types in the latter, provision is made for a sound insulation layer to reduce air and impact notice.

• Composite floor panels, consisting of a load bearing reinforced concrete panel combined with a floor or ceiling panel and soundproofing, insulating, and other lay r, a e often used in housing construction.

4. Large panel structure for Roof Element:

• The large panel roof elements are used in housing and public buildings mainly in the form of combined articles roofs, and in industrial buildings the roof panels have a span of up to 12 m.

• The weight of large panel structure depends on the method of dividing the building into prefabricated element; it is usually 1.5-7.5 tons.

• Large panel structure of a high rise apartment building consist of (1) foundation slab,(2) exterior wall panel,(3) interior wall panel, (4) floor slab,(5) deck ,(6) exterior panel in the process of installation

• At the joints, the panels have to which steel connecting pieces are welded, thus linking together all the panels and providing general stability of the building.

• Large panel structures are used in the construction of high rise building.