In General

With its innovative physical properties, Siporex system offers design and engineering flexibility for a variety of construction applications ranging from single and multi-family residential to commercial buildings, as well as warehousing, schools and government facilities.

Siporex system consists of various product types: wall panels, floor/roof slabs and lintels which can be combined to form a load-bearing structure.

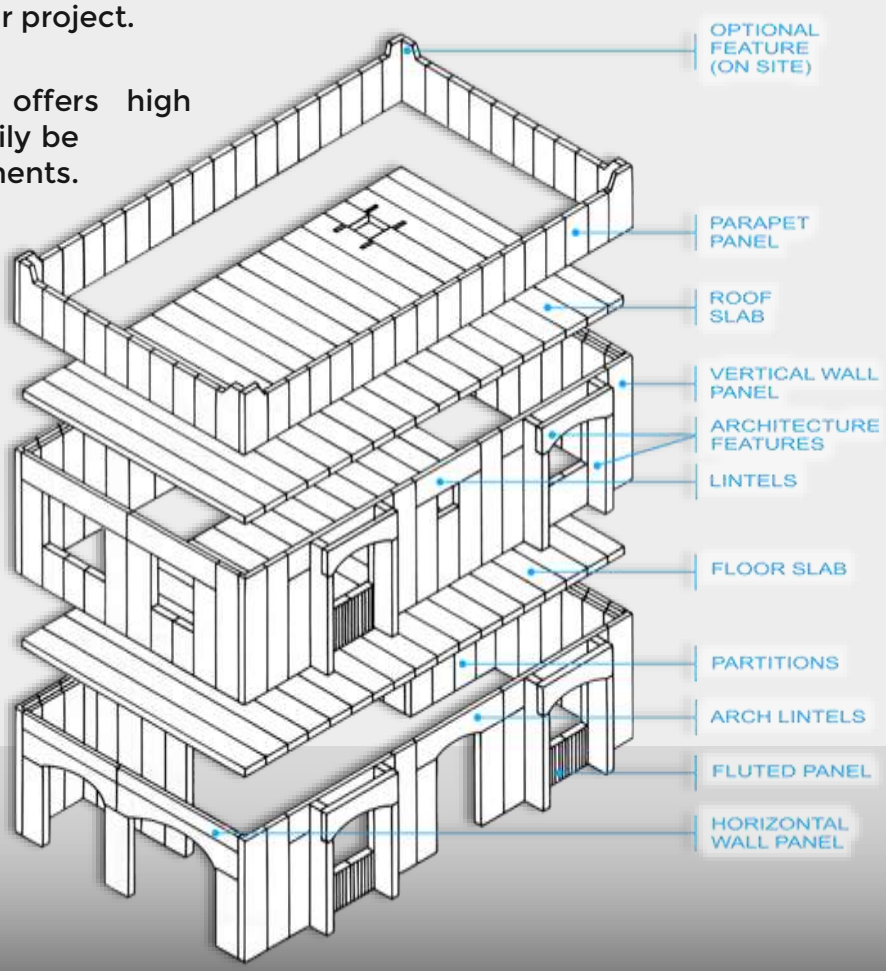
By using this system, costly labour and material intensive in-situ concrete structures of columns, beams, floor and roof slabs can be eliminated.

This fact makes it particularly suited for the construction of buildings up to six storeys.

The width of the units in the Siporex system is in accordance with the international modular standard of 60 cm. Thickness and length of the units can be selected to suit requirements of each particular project.

Therefore, the Siporex system offers high degree of flexibility which can easily be adapted to various design requirements.

Figure shows how the **Component Parts of the Siporex System** fits together to form complete structure:



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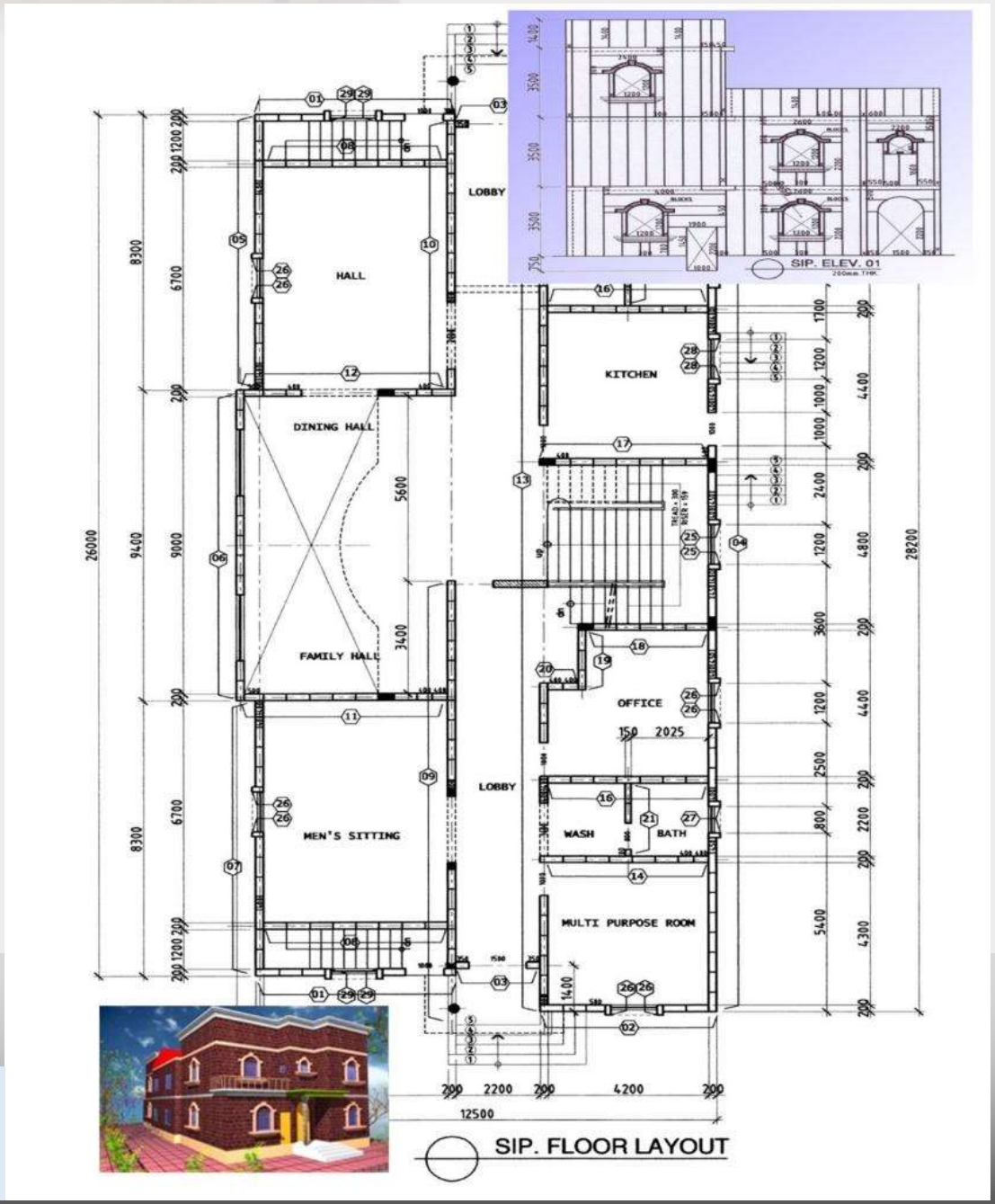
LCC Siporex offers services including technical viability studies of client's projects to Siporex system, quotations, as well as recommendations on how Siporex can be adapted to the original design of your structure that will fit your project-specific needs.



Sample Siporex shop drawings developed from client's architectural plans

Design Principle

Much of the company's work entails the conversion of client's original designs from other materials to Siporex system, generally resulting in cost and energy savings. But the best and most economical use of Siporex is produced by designing in the material from onset.

Optimum results and savings can be obtained through careful design work and meticulous planning before and during execution. Before commencing the architectural design for a project, the following guidelines should be noted:

1. The maximum span of Siporex panels is 6.00 meters. This means that the maximum clear span between the load bearing walls should not exceed 5.85 meters considering 7.5 cm end bearing of floor/roof slabs. The distance between the non-load bearing walls is immaterial. If the clear span is more than 5.85 meters, then steel or concrete beams supported on steel or concrete columns should be used to support the roof slabs.

2. Upper walls are recommended to be aligned with walls of the lower floor. Walls at upper floor supported directly on Siporex slabs are not allowed. When unsupported walls cannot be avoided, intermediate steel beam can be used or convert the wall to non-load bearing lightweight dry wall partition, in order to achieve maximum economy.

3. The foundation should be made high enough such that the external wall panels will not absorb moisture from the ground.

4. Width of door/window openings are recommended to be limited to the allowable spans [shown in Sections 4.2.4 & 4.2.5 of the Siporex Technical Guide] in order to utilize Siporex lintels and avoid the use of in-situ concrete lintels.

Structural System

Siporex buildings are designed based on box system principle. Siporex load-bearing walls act as shear walls resisting lateral forces due to wind or seismic loads. The wall panels have grooves along their edges which form joints when erected. These joints receive steel tie bars from the footing and at the top connecting the lower wall with the one above. As they penetrate the ring beam, a strong connection will be provided between the vertical and horizontal structures. These joints (3.3 x 5 cm) are grouted and they are able to transfer shear forces from one panel to the other.

The roof and floor slabs have tongue and groove as well as notch at the top to be reinforced with 8mm diameter bar between spans and grouted with cement-sand mortar (1:3) consequently eliminating differential deflection. Due to the ring and bond beams around the building, all slabs form membrane acting as laterally stiff diaphragms which can transfer lateral forces to the bearing walls.

These constitute the diaphragm action of the Siporex structural system. Lateral forces are distributed in proportion to the moment of inertia of the walls, that is, proportional to their stiffness. Based on actual experiences of actual occurrences in different countries, It has been noted that Siporex buildings are very resistant to earthquake forces.