

**TECHNOLOGY PROFILE
OF
INDUSTRIALIZED 3-S SYSTEM USING
CELLULAR LIGHT WEIGHT CONCRETE
SLABS & PRECAST COLUMNS**



**Building Materials & Technology Promotion Council
Ministry of Housing & Urban Poverty Alleviation
Government of India
New Delhi**

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System in Brief:

The industrialised total prefab construction technology is based on factory mass manufactured structural prefab components conforming to provisions of relevant Indian Standards.

The major precast elements are:

- RCC hollow columns with notches
- RCC solid beams ('T'/L/Square Shape)
- Staircase
- RCC precast slab
- AAC precast slab
- AAC precast block

In the system, precast dense concrete hollow column shell of appropriate size are used in combination with precast dense concrete rectangular / 'T' shape / 'L' Shape beams with light weight reinforced autoclaved cellular concrete slabs for floors and roofs.

The hollow columns are grouted with appropriate grade of in situ concrete. All the components and jointing of various structures are accomplished through in site concerting along with secured embedded reinforcement of appropriate size, length and configuration to ensure monolithic continuous resilient, ductile and durable behaviour.

Siporex (AAC) slabs can be used as floor / roof slabs. Joints are filled with 1:5 Cement Mortar and separate screed concrete of minimum 40 mm thick - grade M20 is put in the entire area of slab before flooring / water proofing.

Materials Used	RCC hollow columns & Beam		AAC Precast Slab	AAC Precast Block
	Concrete	Reinforcement		
a) Whether Indian Standard Available	Yes IS 456 : 2000	Yes IS 456: 2000 IS 1786:2008	IS 6073:2006	IS 2185 (Pt. 3) :1984

b) Specification as per Indian Standard	Yes	Yes Fe 415 Grade Fe 500 Grade	Grade 1 of Density 551 - 650 Kg/ m ³	Yes Density 451- 550 Kg/m ³ for internal wall 551-650 Kg/m ³ for external wall
c) If India Standard not available / followed. What is the specification?	-	-	-	-
Other Requirement				
Evaluation of Structural Requirement of Joints				
a) Against Vertical Load	<p>a) Full Scale load test on assembly of RC precast assembly by Tor Steel Research Foundation in India, Bangalore.</p> <p>b) Structural Design evaluation for HIG - II Buildings at Powai by Shri H.P. Shah; Stanford University found that based on the design concept, the design calculation and detailing; the structure is safe against vertical loads, seismic loads and the wind loads.</p> <p>c) Scrutiny of design for G+15 HIG type tenements by IIT Mumbai found it safe.</p>			
b) Against Seismic and Wind load	<p>Test performed on full scale building to establish behaviour of various joints under all design loads including seismic zone IV by CBRI. The experimental results on Full Scale Building Structure established the desired performance and behaviour of the system under all loading condition as above.</p> <p>When designed for use in zone V, independent verification may be needed.</p>			
Durability	<p>i) Anti corrosive treatment given to reinforcement used in AAC panels for durability, was evaluated by CBRI, Roorkee with satisfactory results.</p> <p>ii) Concrete and cover requirement is given as per durability clause of IS 456:2000 for durability.</p>			
Fire Resistance property of block / slab as dwelling unit separation	AAC blocks / Slabs used will have property as per the NBC norms for dwelling units.			

Thermal Behaviour	Kvalue - 0.122 k cal/h/m ⁰ c of AAC blocks *.
Acoustic Requirement	For 100 mm ACC Wall, Sound absorption is 38 - 40 db *
Impact Resistance	Not tested *
Ease of Fixing services (Electricity & Plumbing)	With preplanning, electricity & plumbing services can easily be placed.
Availability of Plants & Machinery	Plants & Machineries for production of Components available in Pune and Delhi
Scale of economy	<ul style="list-style-type: none"> i) For a new plant to be setup a minimum project of 5000 dwelling units may be needed. ii) In places, where plant is already set up, smaller project may also be viable.
Limitation	The project is taken as turnkey project by the agency. No other agency is involved in this propriety system.
Major Construction work done	<ul style="list-style-type: none"> i) Residential LIG and MIG housing project at Matulya Mills Ltd., Lower Parel, Mumbai ii) Residential mass housing project of MSCADA, Powai, Mumbai iii) Multistoried Residential Building at Chennai for True Value Homes Pvt. Ltd. iv) Mass Housing Project at Delhi for DDA under evaluation. v) S+30 multi storeyed building for National Peroxide Ltd, Wadala vi) Several projects are being taken up / completed in Maharashtra & Delhi.

Note:

* Implementing agency may verify it, if deem necessary.