

## Manufacturing of Concrete Hollow Core Wall Panels for making Partition walls with worlds latest Concrete Extrusion Technology

Or Light Load Bearing Hollow core Slabs with additional reinforcement for Affordable housing.

**A minimum investment in project is Rs. 30 Lakhs all-inclusive except for land.** Land required about 1-Acre, having length to width ratio of 3:1. Power 35KW.

Machinery: - Imported from China of Approx. Rs. 21 Lakhs (Landed price Mumbai with Import duty, only if complete set is purchased i.e. Wall Panel Extrusion M/c(Auger) Size - 90 mm thick x 600 mm -1set & other Supporting m/c: - Concrete Mixer on stand with platform (with single horizontal shaft mixer having discharging gate installed Bottom of mixer, so that concrete falls directly into tray of manual cart) + Stressing m/c -1set + Manual Feeding Cart for transport of concrete mix delivery- 2 Nos. + Slab Cutting m/c for Panels – 1Nos. + Wire Coil Dispensing stand -3 Nos. + Swivel crane& Balance 9 lakhs is cost towards, Civil Work for making well-leveled long line Concrete Platform for 10 Lane(Which is similar to making concrete road) of size 360 feet x 35 feet for Extrusion of wall panel's slab etc. + Civil cost for Abutment + Steel Flats to be grouted on Floor for Guiding Extrusion M/c & Cost of Land Development to set-up plant. With above machinery you can also manufacture Light Load Slabs with additional reinforcement for Affordable housing, Mezzanine floor, Factory walls, Fencing wall, Heavy-duty boundary wall etc.

**Additionally manufacture** other Extruded concrete products like Boundary Wall Panels & Supporting 'H' column, Beam, Column, Lintel, Fencing post, 'T' Beam, Purlin Etc. with respective Extrusion m/c & it's size on the same concrete platform & above Supporting machinery.

<b>Complete Manufacturing Cost:- Cost per Sq. feet of Concrete Hollow core Wall Panels</b> (Most commonly used Size is: - 90 mm Thick x 2 feet Width x 9 feet long, weight – 228 Kgs.= 18Sqfeet ) Concrete Mix contents: - Cement + Sand + Aggregate (or use LECA -lightweight aggregate or Foundry slag for making panels light in weight)		<b>Panel Rs / Sq. Ft</b>
<b>1</b>	<b>Cost of Concrete Mix</b> For making Concrete Hollow Core Wall Panels. Cost of Raw Material – Cement – Rs. 5,500 / Ton, Sand – Rs. 950 / Ton, 8mm aggregate Rs- 650/- + carbon steel Wire – Rs. 58 / kgs. Hence Cost of Concrete is Rs. 3000/- CBM, So Concrete cost per Sq feet is Rs 18.80 + carbon steel wires 8 nos. of 3mm Dia. is Rs. 7.85 per Sq feet. Total Panel Cost per Sq. feet Rs. 18.80 + Rs. 7.85 = 26.65. <b>For Handling comforts making Panels light in weight by replacing Aggregate by LECA, then weight of panel for above size is 145 Kgs. &amp; Cost of concrete increases by 80 %. (26.65 + 21.32 =48) &amp; If replaced with Foundry slag, Weight of panel for above size will be 175Kgs&amp;Cost of concrete increases by 15 % (26.65 + 4 = 30.65)</b>	26.65
<b>2</b>	<b>Cost of 8 Nos. of Labor per Sq. feet:</b> - Rs.12,000 / Month For 12 hrs. / Shift & 300 days working & 90% efficiency per Sq. Feet of panel	0.70
<b>3</b>	<b>Cost of Cutting:</b> - of Concrete Slab, Average length of panel required is 9 feet i.e. Room Height & The cost of Wear & Tear of blade per cut is approx. Rs 2/- there by Cost of cut per Sq. feet of panel is	0.65
<b>4</b>	<b>Cost of Local Power / D.G. Set (35KW)&amp; Water</b> (1,000 liter /day) for Slab per Sq. Feet of panel is	1.00
<b>5</b>	<b>Cost of Repair &amp; Maintenance:</b> - 10% of the plant cost (21 lacs) is considered as annual cost of maintenance + Cost of Wear & Tear parts like Screw compression part i.e. Auger. Packing bar, Vibrating plate, Slide strips for side plates, Side board set	3.00
<b>6</b>	<b>Cost of Rejection:</b> - 2% of Panel cost for Rejected panels, Wastage, Breakage & shortage in Raw Material Etc. per Sq. Feet of panel is	0.60
<b>7</b>	<b>Cost of Land on Rent:</b> - For 1 Acre Land @ 50,000 per Acre per Month per Sq. feet of panel is	0.65
<b>8</b>	<b>Amortizing &amp; Depreciation cost</b> on Plant & Machinery (21 lacs) for <b>60 months</b> per Sq. Feet of panel is	0.65
<b>9</b>	<b>Cost of Interest:</b> - On 30 Lakhs @ 18% per Annum per Sq. Feet of panel is.	0.60
<b>10</b>	<b>Cost of Packing enabling Dispatch:</b> - Plastic Strip Strapping + added Cost of Storage, Handling & Misc. Expenses.	1.50
<b>11</b>	<b>(Production per day on 10 lanes of 350 feet long is 6000 Sq. feet.)</b>	<b>Total Cost for Wall Panel per Sq. Feet</b>
	<b>Total Cost for Wall Panel:-387 per Sq. Meter (36 Sq. feet x 10.76 = 387 Sq meter)</b>	<b>36</b>

**Please note:** - Investing 14 Corers in European Automatic Plant for above Wall Panel the Interest carrying cost is Rs.15/- per Sq. feet& Cost of Amortizing & Depreciation for 5 yrs. is Rs.17/- per Sq. feet, where as our cost is (manual operation plant) just 0.60 per Sq. feet& 0.65 per Sq. feet respectively. Our Concrete Wall Panel cost is Rs.36/Sq. ft with 8 Nos. of steel wire, where as European Wall Panel cost is: -Cost of Raw Material + Labor & Other manufacturing cost +Interest + Depreciation is Rs. 32/Sq. ft that too without Steel wire reinforcement. In European Automatic plant steel wire reinforcement is not possible.

### Advantages of Concrete Hollow core Wall panels for making Partition walls

- Very Quick & Ease to install, Saves Time and minimize the need & use of skilled labor.
- 3 person's team can install 500 Sq. Feet a day. (5 times faster than traditional method.)
- Planks are made of Concrete, hence no need of cement mortar plastering
- Dry wall , No Curing.
- Excellent Resistance in wet condition, most ideal for kitchen, bathroom apart from other rooms.
- Concrete Hollow core Wall Panels have an installed cost very competitive with constructing wall from other Conventional material like AAC / Solid concrete blocks.
- Best replacement to AAC / CLC blocks / Solid concrete blocks, Ply wood Boards, cement bonded particleboard, Resin bonded particleboard, Gypsum plasterboards etc.
- Manufacturing cost of Concrete Hollow core Wall panel is very Low.
- For large size project, Manufacture Panels at site, on the central concrete road & install panels there & there only, it saves Hassel of Transport & its cost plus saving in Govt. Taxes& duties.
- Needs only 7 labors.
- 50% margin for duly installed wall compared to market price of wall with other conventional material.
- Production / day of wall Panel is 6000 Sq. feet.
- Increase carpet area in comparison to brick / blocks.
- No Zari work for conducting. Cylindrical "cores" of hollow core plank work as natural conduits for plumbing & electrical wiring, there by saves cost.
- No Lintel, No stone sills, No maintenance.
- No of joints for wall panels are less compare to block.
- Light in weight (Being hollow) allows for lower dead weight thus reducing structural steel cost.
- Very high Compressive strength is 40 – 50 N / mm<sup>2</sup>.
- Keeps Construction site clean from concrete wastage / debris & its disposal.
- Less Traffic, congestion & better Construction site management.
- Saving in transport cost of bricks, sand, cement, steel, water, scaffolding & shuttering materials.
- Flexibility of shifting is very easy in case of labor unrest.
- Being hollow they do not interfere with Wi-Fi & Internet networks.

### Advantages of using LECA (Light weight aggregate) made panels is same as above + as follow: -

- Being light easy to handle during lifting panels to various levels as well as for installation.
- Planks are Hollow-structured as made from LECA having double performance of sound- barrier / insulation of up to 38 dB. Good Fire resistance as LECA is used in Concrete.
- It reduces unwanted noise from entering / as well as controls noise Ideal for Hotel rooms etc.
- Easy workability like wood.
- Environmentally friendly product as it can be re-cycled.

## Comparison:-Concrete Hollow core Wall Panels v/s AAC Blocks, Solid Concrete Blocks & Clay Bricks.

<b>Cost for Installation of Concrete Hollow Core Wall Panels for Making Partition walls.</b>		
Panel Size 90mm x 600 x 9.84 feet for making Partition Wall of 1076 Sq. feet (100 Sq. meters)		
Manufacturing Cost for Concrete Wall Panel is Rs. 36 per Sq feet. (90mm x 600 x length 9.84 feet (3 meter) = 19.68 Sq. feet x 36 Sq feet = Rs 708 / panel		
	Particulars	Total (Rs.)
1	For making 1076 Sq feet of wall you Require 55 Nos. of Panels of Size: 90 Thick X 600mm wide x 9.84 feet height (3 meter) 55 x Rs. 708 = Rs. 38,940.	38,940
2	Charges for loading panels on various floor by Crane (Hydra 14 Ton) on Hire is Approx. Rs 8 /Sq. Ft. X 19.68 per panel x 55 Nos. of panels is	8,659
3	Cost for Fixing / installation of 55 nos. of panel with Mortar (Cement & sand Mixture) at Top & Bottom surface of panel + labor is 72Sq feet x Rs. 25.	1,800
4	Cost for fixing panels to each other on vertical joint + sealing Gaps in Tongue & Groove 90mm x 3 mtr = 92 Sq ft x 12 =1104/- + Recession on ends of panel with Arpita mesh from both the side of 2 panels + Labor with Jointing cement (Cement & sand Mix made by Ultra-tech / Silicofix / Unifix / Magicbond ) Size 40 + 40mm X 3 mtr height & 4 mm thick x 2 for both the sides is 155 Sq feet with mesh 155 Sq Ft X Rs. 12 = Rs. 1860 + 530 = 2390 (Arpita fiber wire mesh 40mm width x 1062 Running ft X 0.5 per running feet = Rs 531) G . total 1104 + 2390 = 3494 /-	3,494
5	Cost of skim coat / Wall putty before applying final paint on face of wall, 3 mm thick + Labor for 1076 Sq. ft.@Rs 8 / ft =8608 x 2 face = Rs. 17,216/-	17,216
<b>Total cost of Installing Concrete wall panels will all material + Loading + labor + finishing etc. for 1076 Sq feet</b>		<b>70,109</b>
(Hence Cost per Sq. feet i.e.55 Panels + Loading + Fixing Material + labor + wall putty finishing Is 70,109 / 1076 = Rs 65 per Sqft) Rs / Sq. Feet		65
You are required to do your working before you make investment, as we will not be responsible for above calculation in what so ever is the case		

<b>Total Cost of Making Partition Wall with all material &amp; labor&amp; finishing both the faces of wall</b>					
Below is Example for 1076 Sq. ft. (100m <sup>2</sup> ) of Partition wall					
Sr. No.	Description	Concrete Hollow Core Wall Panel made from our Extrusion machinery (4" wall)	AAC / SIPOREX Blocks (4" wall)	Solid Concrete Blocks (4" wall)	Bricks (6" wall)
1	Panel / Block / Brick Size in mm. Length x width x thickness& Sq. ft	3000 X 600 X 90 = 19.68 sq. ft - 250kgs(Cut length as required without wastage)	625 X 240 X 100 = 1.57 sq. ft	390 X 190 X 90 = 0.80 sq. ft	230 X 75 X 115= 0.18 sq. ft.
2	Weight per 1 m <sup>2</sup>	140 kg / m <sup>2</sup> For Concrete hollow core panel	70 kg / m <sup>2</sup>	180 kg / m <sup>2</sup>	190 kg / m <sup>2</sup>
3	Comprehensive Strength	40 - 50 kg / cm2	28 - 35 kg / cm2	40 - 50 kg / cm2	25 - 30 kg / cm2
4	Installation Speed for making Partition wall.	492 Sq. Ft / Day (25 panels /day) Double the speed of AAC blocks	258 Sq. Ft. / Day	236 Sq. Ft. / Day	86 Sq. Ft. / Day
5	No of Panels or Blocks Required for 1076 sq. ft.	55 panels of above size	650 Blocks	1265 Blocks	4,900 Bricks +10% extra= 5390 nos.
6	Panel cost OR Block cost per Sq. feet	Rs. 36/- per Sq. feet	Rate Rs. 3800/- CBM	Rs. 38/- per Sq. ft	Rs. 35/- per Sq. feet
7	Material cost for Partition wall of 1076 Sq. feet	55 X 19.68 X Rs.36/Sq. ft = Rs. 38,940/-	1076 X 34 = Rs. 37,000 /-	1076 X 38 = Rs. 41,000 /-	1076 X 35= Rs.37,660/-
8	Cost of loading / Cartage / Hail Unloading till say 4th floor of site	Crane hire cost to lift 55 panels is 8,659/- i.e. Rs. 8 / Sq feet after 5 <sup>th</sup> floor.	Manual labor cost Rs 3 X 650 =Rs. 1,950/-	Rs 2 X 1265 = Rs. 2500/-	Lump sum Rs. 2,500/-
9	Total Cost of material + cost of Cartage Till 5th floor for Panel / Block.	Rs.38,940 + 8659 = Rs. <b>47,599</b>	37,000 + 1,950 = <b>39,000</b>	41,000 + 2500 = <b>43,500</b>	37,660+ 2500 = <b>40,160</b>
10	Cost of Installation with Mortar (Cement & sand Mix) / Jointing Bond Plus Labor. A). Fixing with Mortar (cement & sand mix) between concrete Blocks / Top& bottom of Wall Panels to make wall @ Rs. 25 /per Sq ft OR B). Fixing with Readymade Jointing Bond Material for AAC block or fixing 2 panels side by side in vertical face of Tongue & Groove. Ultra-tech / Silicofix / Unifix / Magicbond @Rs 12/ sq. ft.	Fixing with Mortar (Cement & sand Mix) at Top & Bottom of panel is 72 sq ft x @ Rs. 25 /per Sq ft= Rs.1,800+ fixing2 panels side by side in vertical face of Tongue & Groove with Jointing Bond material is 92Sq feet @ Rs.12 / Sq. ft. = 1,104+ leveling depression of 40mm between 2 panels along with Fiber wire mesh (Arpita). Size 40 + 40 x 3 mtr height & 4mm thick with Jointing Bond x 2 face = 155 Sq feet x Rs12/ Sq. ft= 1860 + wire mesh cost Rs 530 = 2390. Total 1,800 + 1104 + 2390= <b>5,294/-</b>	Fixing with Readymade Jointing Bond material all sides of AAC Blocks with 5 /6 mm thick for 1420 sq ft x@ Rs. 12 /Sq. ft = <b>Rs. 17,040/-</b>	Fixing with Mortar (Cement & sand Mix) all sides of Blocks with 10mm thickness 1323 sq ft x25 = <b>Rs. 33,000/-</b>	Fixing with Mortar (Cement & sand Mix) all sides of Blocks with 10mm thickness 2035 sq ft x 25 = <b>Rs. 50,875/-</b>
11	Consumption of wall Putty / Gypsum / Mortar for Plastering & finishing on both Face of the Partition Wall. A). Wall panel needs only Skim coat of Wall putty as is made of Concrete. B). AAC block is plastered & finish with 15mm Thick Gypsum material. C). Concrete Block is plastered & finish with 12mmMortar (Cement & sand Mix)	Being good Extruded Concrete Finish, just needs Skim coat of Wall Putty plaster of 3mm Thick X 1076 Sq ft per face X @ Rs.8 Sq ft (Rs 6 material + 2 labor)= Rs. 8608 x 2 faces = Rs. <b>17,216/-</b>	Material & labor cost for Gypsum Plastering is 1076 X Rs. 25sq. ft = Rs. 26,900/- x 2 faces = <b>53,800</b>	Material & labor cost for 12mm Mortar for Plastering is 1076 X Rs. 30 sq ft = 32280 X 2 faces = <b>Rs. 64,560/-</b>	Material & labor cost for 12mm Mortar for Plastering is 1076 X Rs. 30 sqft = 32280 X 2 faces = <b>Rs. 64,560/-</b>
12	Total Cost of Making Partition wall With all material & labor For 1076 Sq. ft (100 Sq mtr)	47,599 + 5,294+ 17,216 = 70,109 70,109 / 1,076= <b>65/- per Sq. ft.</b>	39,000 + 17,040/-+ 53,800/-= 1,09,840/ 1076 = <b>102/- per Sq. ft.</b>	43,500 + 33,000 + 64,560/-= 1,41,060 / 1076 = <b>131/- per Sq ft</b>	40,160 + 50,875 + 64,560 = 1,55,595 / 1076 = <b>145/- per Sq ft</b>

<b>Comparison of our Concrete Hollow Core Wall Panel with Wall Material used in Market</b>					
Description	Concrete Wall Panel made with our machinery	Concrete Block for Wall	AAC block for Wall (Siporex)	Bricks for Wall	Plaster Board / Panel (Everest)
Strength	Very High	High	Medium	High	Low
Resistant to Moisture	Very High	High	Medium	High	Low
Sound Insulation	Very High	Medium	Low	High	Very Low
Resistance to Fire	High	High	High	High	Low
Requirement for Labor	Very Low	High	High	High	Low
Install Speed	Very High	Very Low	High	Very Low	Very High
Electrical Installation	Easy	Medium Easy	Tedious	Tedious	Tedious
Thickness of Plaster	Only Skim Coating	Thick Plaster + Coating	Only Skim Coating	Thick Plaster + Coating	No Plaster No