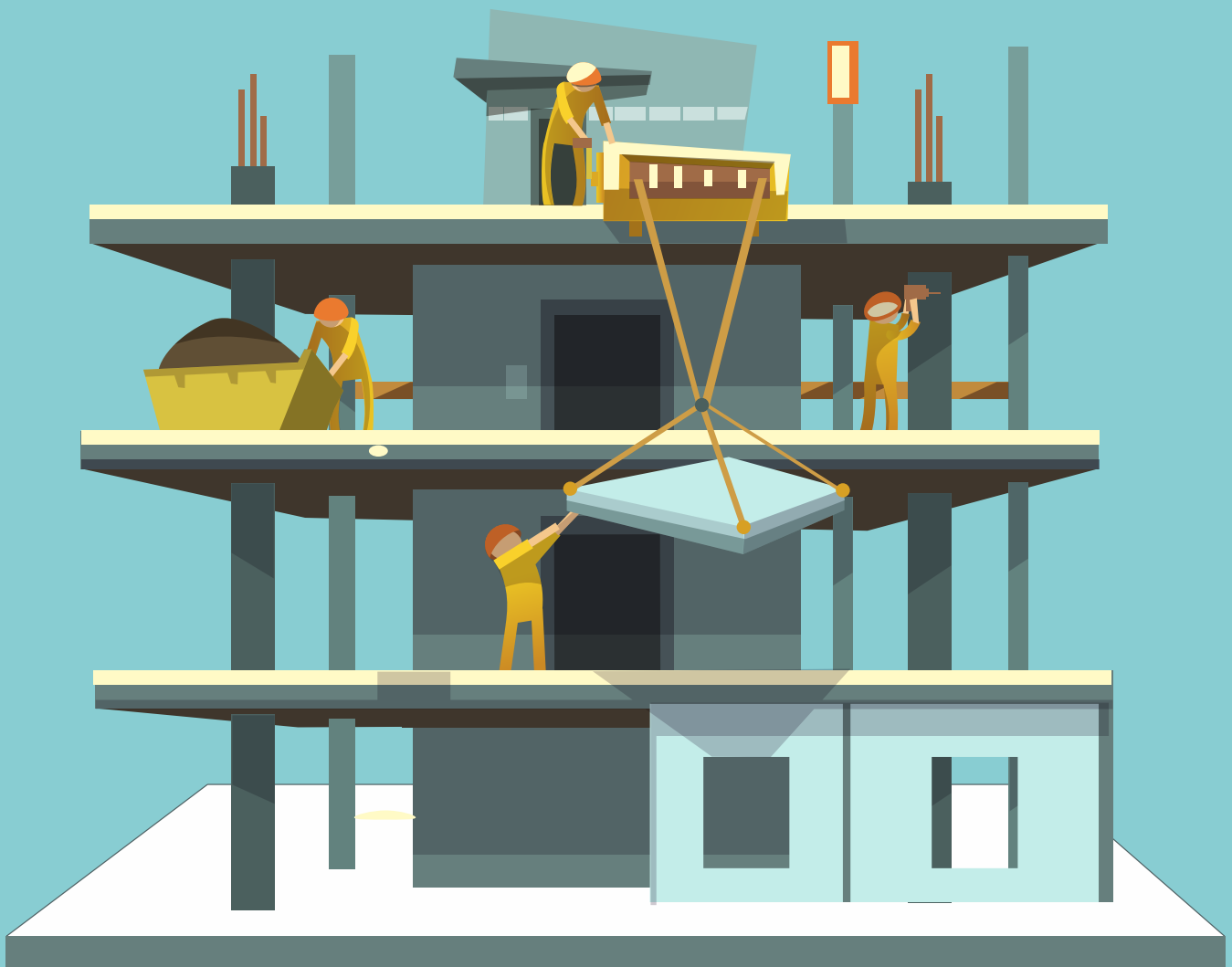


# Rapid Wall Panel Technology (An Alternate Building Solution)

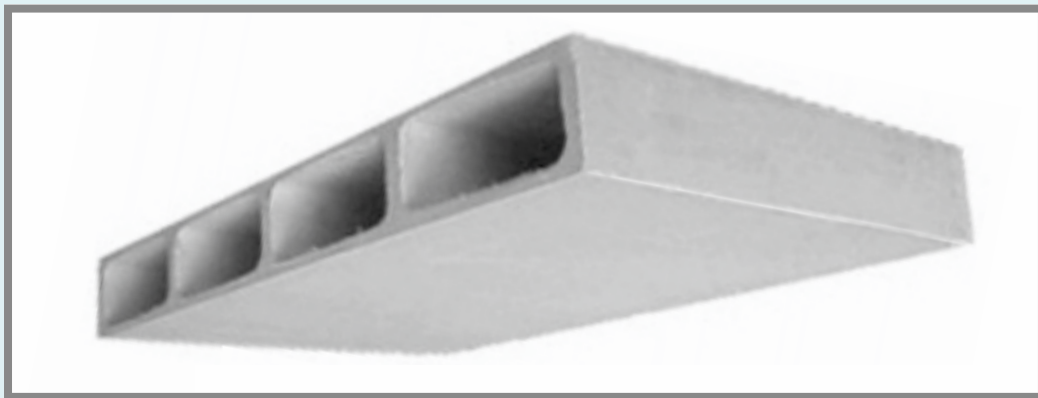


## **RAPID WALL SYSTEMS**

The most consumed part of any real estate structure is wall. So to study the alternative solution to conventional type of wall we need to know about Rapidwall systems.

### **INTRODUCTION**

Rapidwall is a single panel walling system that serves as both the internal and external wall and eliminates the need for bricks, blocks, timber and steel wall frames and plasterboard linings. It is the most ecologically sound and technologically advanced building product available in the world today.



- Rapidwall is a prefabricated walling panel & load bearing building panel with broad construction applications and multitude of uses for the construction industry.
- It is suitable for load-bearing walls for individual domestic cottages as well as for multi-storey residential buildings, for commercial and industrial development.; for formwork for suspended concrete floor structures and for most other purposes for which traditional building materials are currently used.
- Rapidwall eliminates the need for bricks, timber wall frames and plasterboard as it serves as both the internal and external load bearing wall.
- Because of its low energy and environmental credentials, Rapidwall is particularly suitable in areas where traditional building materials, that have high energy usage, high carbon emissions or cause degradation to the environment, are no longer sustainable.

- Rapidwall panels are manufactured, in moulding process, from high grade gypsum plaster and glass-fibre rovings. All panels are up to 12 metres long and 3 metres high. The panels are cellular in form and 123 millimetres thick. The hollow sections, or voids, have 250 millimetre centres.
- The panels are cut in the factory to design specifications to a maximum tolerance of 5 millimetres.
- After cutting, the panels are loaded onto collapsible frames called stillages ready for transport to the building site. Up to 500 m<sup>2</sup> of Rapidwall can be transported on one truck.
- The panels are lowered into position using a small crane and supported by props until the structure is completed.
- The hollow sections can accommodate building services such as plumbing and electrical conduits. The formed cells can be filled with insulation for increased thermal performance or with concrete for increased load-bearing structural capacity.

| Specifications                             | Unfilled                              | Filled with concrete                                       |
|--|---------------------------------------|--|
| Weight (123mm) Rapidwall                   | 44 kg/m <sup>2</sup>                  | 250 kg/m <sup>2</sup>                                      |
| Sound rating (Rw) 120mm Rapidwall          | 28                                    | 49   |
| Fire Rating                                | 1 hour                                | 4 hours*   |
| Ultimate Design Bending Capacity           | Ø x 2.5 kNm/metre width               | Ø x 22.7 kNm/metre width                                   |
| Load Bearing Capacity                      | 100kN/m - 2 Stories residential       | 870kN/M filled with 20Mpa concrete - 8 stories (Typically) |
| Void volume / M2                           | 86 litres / m <sup>2</sup>            | N.A.   |
| Horizontal shear strength                  | 50kN/m                                | T.B.A.   |
| Axial Load capacity / compressive strength | 160kN/m                               | T.B.A.   |
| Water Absorbtion                           | Less than 5% after 24 hours immersion | N.A.   |

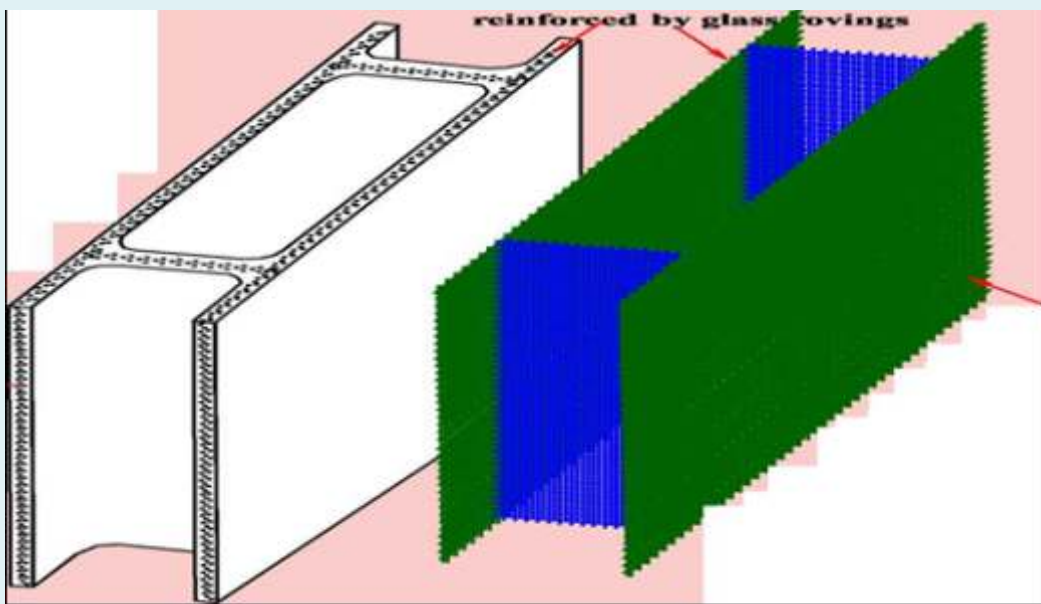
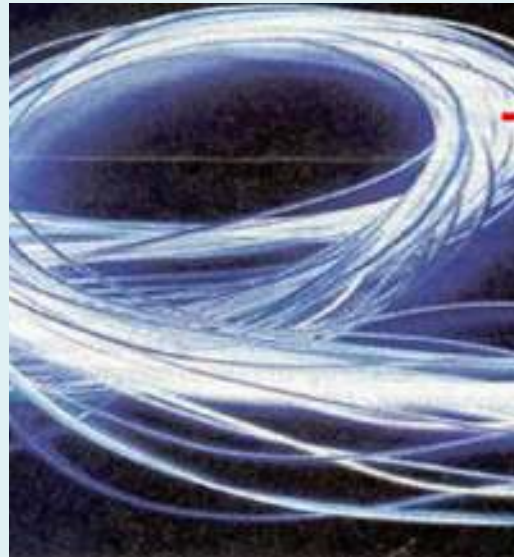
## 1. HOW IT IS PREPARED?

- Rapidwall Panel is reinforced by micro-strand glass rovings (13 microns) by both ways on all four sides - both flanges and webs.
- This glass roving itself is a hi-tech product manufactured in India. Reinforcement is provided during the automated hi-tech production process itself.
- This reinforcement provide load bearing capability & "confinement property" when cavities filled up with concrete.

<https://www.rapidwall.com.au/worldwide/india>



## 2. MICRO-STRAND GLASS ROVINGS (13 MICRONS)



### **3. PROCEDURE OF INSTALLING RAPIDWALL PANEL**

1. Cutting of panel to required sizes using atomized cutting saw in factory.
2. After cutting Rapid wall is loaded onto collapsible frames, ready for transport.
3. After reaching required site Panels are erected with the help of cranes and fixed at required position.

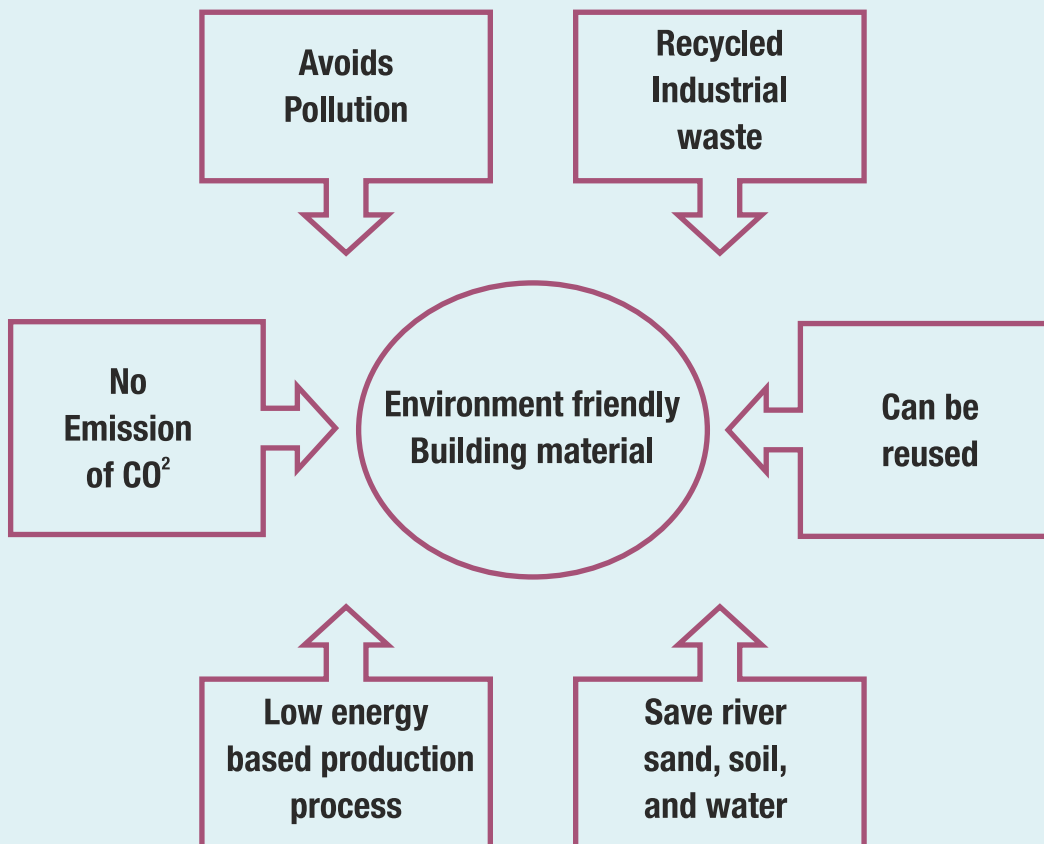
[https://www.youtube.com/watch?v=j1bL\\_1NBvlc](https://www.youtube.com/watch?v=j1bL_1NBvlc)



## 4. ADVANTAGE OF RAPIDWALL

### ADVANTAGES OF RAPID WALL PANELS

- Light weight panels
- Economical
- Load bearing
- High quality finish
- Earthquake resistance
- Water resistance
- Termite resistance
- Fire resistance
- Speedy installations
- Environmental Positive
- Good noise resistance
- Accommodates Building services



## 5. PROPERTIES OF RAPIDWALL

### PROPERTIES OF RAPID WALL PANELS

- Compressive strength
  - a) Empty panel -  $73.10 \text{ kg/cm}^2$
  - b) Concrete infill panel- $180.70 \text{ kg/cm}^2$
- Flexural strength
  - a) Empty panel -  $21.25 \text{ kg/cm}^2$
  - b) Concrete infill panel-  $20.80 \text{ kg/cm}^2$
- Water Absorption - $<2\%$  (24 hrs )
- Ductility - 4.11
- Fire Resistance -4 hrs rating  $700^0 \text{ c}$  to  $1000^0 \text{ c}$
- Free from corrosion
- Density -  $1140 \text{ Kg/m}^3$
- Light weight
  - a) Wighout concrete infill -  $40 \text{ Kg/m}^2$
  - b) with concrete infill -  $250 \text{ Kg/m}^2$
- Earthquake resistance-panel with stood earthquakes up to 8 Richter scale



## 6. How Rapidwall Technology proved as beneficial product for Affordable Housing

- Speed in construction to complete the project as early as possible.
- To create Eco-friendly building units for Eco-housing/ green building.
- Quality Construction.
- Easy installation with the help of crane will reduce accidents.
- Cost Savings: Following figures will describe the extent of saving in various conventional building material due to one panel-
  - 10000 Lit of water
  - 2.43 m<sup>3</sup>/ 86 cft of river sand
  - 8 m<sup>3</sup> of soil
  - 0.80 tons of cement
  - Emission of 0.696 tons of CO<sub>2</sub>



Two storey Construction of First Rapid wall Building in India in Mumbai in 32 days by RCF (structural design by IIT Madras)



Sydney Park housing complex with 922 apartments. This eight storey building is without RCC columns and beams. The entire structure is built on Gypcrete® /Rapid wall panel.



Seven storey Apartment Gypcrete building in Tianjin, China.



Six storeyed Guest House building in an industrial park in Jinan city, Shandong Province, China.

**7. Rapid wall is being used magnificently for the construction of different types of buildings including buildings up to 10 storeys high. A few projects mentioned below are successfully executed in India:**



Rapid wall 2 storeyed Residential building at Manipal



Rapid wall Courtyard Home in Vellore



Rapid wall Residential building at Mumbai

**In India Rapidwall has been rigorously tested by the University IIT Madras and certified by Structural Engineering Research Centre (SERC) for use in the construction of buildings in earthquake prone areas of up to 10 storey's.**

## 8. Conclusion

It is just not possible to continue to build with traditional materials and achieve sustainable development.”

In India the projected population by 2026 will be 1,400 million. It is estimated that the housing shortage will top 90 million in India. In order to overcome this huge housing shortage is an urgent need for alternative building materials.

Building materials that:

- Are energy efficient,
- Have little or no CO2 emissions,
- Are strong & durable,
- Can be constructed quickly,
- Are resistant to natural disasters like earthquakes, cyclones and fire,
- Can be produced at a cost to meet needs of masses and
- Have the ability to be recycled.

Sustainable development also means we need to have an eye on environmental considerations.

Conventional walling materials such as fired clay bricks, solid and hollow concrete blocks, tilt-up concrete panels; timber frame, external steel cladding and steel frames have a detrimental effect on the environment. They are high energy users; deplete valuable agricultural land, cause environmental pollution, deplete forests and water and cause high CO2 emissions.

Even though these conventional materials will be around for a very long time there are now serious questions being asked by every government about the impact these products have on the environment and on climate change.

And it's not a question of whether we personally believe in climate change or not; most people do agree that reducing carbon emissions will have a beneficial effect on the environment.

In India, clay brick production accounts for 27% of total national energy consumption.

For every million bricks produced 0.8 of a hectare of agricultural land is destroyed; 5.6 megawatts of energy is used and 310 tonnes of CO<sub>2</sub> is emitted. Scarce water resources and sands and minerals are depleted and the atmosphere is polluted.

Within just a few years cement production in India has increased from 100 million tonnes per year to the current level of 160 million tonnes and steel production from 30 million to 60 million tonnes.

Presently 200 billion bricks are produced annually and demand is growing exponentially.

What are the alternatives?

-Annual investment in housing in India will run at between US\$28 and US\$38 billion and the cost of building methods is increasing exponentially each year.

-With traditional building materials degrading the landscape and adding significantly to CO<sub>2</sub> emissions, building from environmentally friendly Rapidwall has become even more attractive.

-India produces significant amounts of fertilizer for worldwide use but in doing so creates phospho-gypsum as a by-product in the order of millions of tonnes annually. Presently there is 31 million tonnes of excess phospho gypsum stockpiled and this is added to annually by 2.5 million tonnes.

-By utilising Rapid Building Systems the phospho gypsum can be turned into plaster and subsequently into Rapidwall, thereby cleaning up the environment.

-This stockpiled Gypsum is enough to build 5 million 30sqm Rapidwall homes.

-By comparison to traditional building materials, Rapidwall is a low energy user, has little CO<sub>2</sub> emission, helps to clean up the environment, is 100% recyclable and is cheaper to produce.

### **Manufacturer in India: Rapidwall Building Systems India Pvt Ltd**



Rapidwall Plant, Mumbai.

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