



Light weight ferro-cement elements

In many cities as well as small towns the building plots are small and it is important to have thin walls for two- and three storey buildings. In addition, the construction time should be minimized due to social and financial reasons. Conventional construction can not respond to those demands.

Big industry has developed many different systems to deal with those conditions, but they invariably respond to a complicated technological level and depend on sophisticated equipment and workmanship and high tooling cost. They are usually geared to large projects and do not respond to the demands of small constructions.

Very often the plot is already being occupied by a shack or a substandard house and it is important to erect the new building within days and with labor from the same neighborhood, but at an affordable cost.

Thus, several members of EcoSouth have put their minds toward creating an easier and less expensive system. We present a solution developed by CECAT in Cuba and put in practice in Cuba as well as in Nicaragua, El Salvador, Ecuador and most recently in Haiti.



What is the difference to other systems?

This system is based on vertical elements made of ferrocement and horizontal concrete tie-beams. All elements can be lifted and placed by two people, no mechanical device is needed. Elements are precast in the workshop and transported to site. U-shaped beams form the foundation and are placed on top of concrete blocks that have been poured earlier.

The vertical elements are self-supporting and are placed one next to another and then tied at the top with a beam of reinforced concrete. The system is highly resistant to earthquakes, according to calculations based on international standards; an earthquake of 6.5 on Richter scale will not do any structural damage to a 3-storey house made with this system. The same is true for wind loads from hurricanes of the maximum known scale.



The technology adapts to local design culture

The panels are made of high performance micro concrete and have a smooth finish. They are 3 cm thick and every element is "framed" with an 8 cm wide reinforcing girder. A wire mesh is imbedded in the concrete as reinforcement. The tie-beams are reinforced with steel bars.

Panels for ceiling slabs in multi storey buildings are made with different moulds and size according to the flexural strength needed in any specific building. They can be used as roofing panels.

The Cost Advantage

Wherever speed in construction is important this system should be an economical option. The elements can be produced by local workshops of the formal or informal sector and react with flexibility to the customer, thanks to the fact that the technology is easy to master and does not need expensive investments in tools and heavy machinery. A set of good metal moulds represent an investment of approximately 3,000 USD and will allow the production of elements for three to four rooms per week. Higher production can be achieved by adding more moulds.



Panel production with self compacting concrete

Limits of application

The production process of the panels has to be closely monitored, as errors in concrete mixing or placing of the wire mesh can diminish the product quality. As all elements are calculated to optimize the use of materials, this could represent a danger.



Ferro-cement elements produced by SME's

This system has been conceived specifically for production in small workshops. Panels are using the micro concrete technology and can be vibrated by different means or produced with self-compacting concrete. All elements are manipulated by hand, none of them weighs more than what two people can carry.

A workshop can operate in a small area, possibly right inside high density neighborhoods and slum areas, close to the potential market. It does not emit high levels of noise.



Development from a core unit to a full house

Disaster Mitigation

The system has high potential for fast action after earthquakes, floods, hurricanes or other events where fast construction is needed. If panels are available, a group of small structures of only one room could be erected within days. The rest of the house could be built later around those core structures. Ferrocement elements can be stored for long times without them deteriorating, and they could be transported to the site while production is set up near the site of the catastrophe. This could be the start-up of an income generation project. This concept has been implemented successfully in Haiti after the 2010 earthquake.



The EcoSur Network provides comprehensive know-how transfer including feasibility studies, technical training (production, quality control) and business skills.

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