Vol-1 Issue-5 MARCH 2013

FERROCEMENT NEWS

2nd National Convention

Ferrocement Society (India) has announced 2nd National Convention **FS-2013** in July 2013 after the success of 1st convention in May 2011. Details about submission of papers can be seen on the website www.fs2013india.com

The theme of the convention is

GO GREEN WITH FERROCEMENT.

Ferrocement panels gain acceptance

A new UN habitat publication highlights the Cuban experience of building with ferrocement panels, while a series of apartment houses are under construction with this technology in the Dominican Republic, as well as two community buildings in Haiti.

The "International Ferrocement Society » (IFS) successfully organized its 10th International Symposium on "Ferrocement and Thin Reinforced Cement Composites" (**www.ferro10.com**) in Havana, Cuba, in October 2012.

(More on page 3)

Courtesy: Pramila Krishnan, Arroville

A MASON SHAPES GREEN BUILDINGS

Ulaganathan (42) worked as chithal (small-time daily wage earner) in construction projects in his native Kuliyapalayam village, 10 km off Puducherry, in 1984. Now he is a successful 'green' builder receiving orders from even Coimbatore, Madurai and other cities in Tamil Nadu after he learnt green building concepts.

(More on page -2)

A ferro-cement basin
(size 21" X 52") made by students (cost Rs.693)

School without Walls in Konkan area

Syamantak's "School without walls" is located at Dhamapur, a small hamlet in the district of Sindhudurg, (MAH). Beautiful lake, thousands of lush green trees, hornbills, wild parrots, peacocks; all this makes this place rather incredible. But to have all these and not have leisure to look at it and learn from looking is very absurd. Learning through observations is much more important than learning from books. One has to learn certain things from books but learning through what you see, hear and do brings great sense of sensitivity.

Here education is related to our Mother Earth & nobody should be forced to leave his village for bread, butter & education. None should be detached from his Mother soil for the sake of keeping body and soul together. Ferrocement is a technique which is taught to the students. Students make many products from ferrocement as their projects.

Building Technology Park Jaipur.
Affordable ferrocement houses are displayed in Jaipur, Rajasthan, compound walls, roofs and water tanks are displayed. ferrocement cattle feeds are also kept for the rural people.

FERROCEMENT...

an alternative building method

This is a design of architect Dr. Eugene Tsui, Tsui Design and Research, Inc., Emeryville, California, USA.

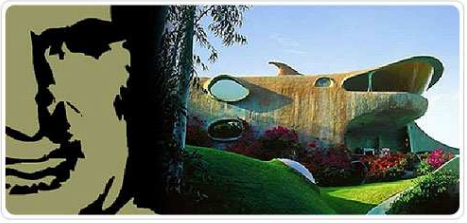
Visit the Tsui House and see more of his extraordinary DESIGNS.

This advanced building method, with comparative building costs, is earthquake resistance, time saving, and very flexible, allows the imagination to run wild, permitting wonderful "Gaudi" style structures. Whether you want to build a house, pergola, car port, pool or just some garden furniture, ferrocement is a great alternative. Work undertaken in Malaga, Benalmadena, Alhaurin de el Torre, Marbella and all villages of the Costa del Sol.

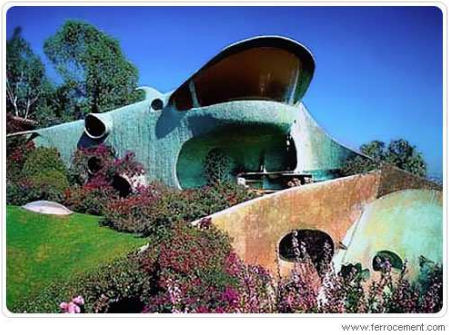
Students in J J College of Archi, Mumbai

Javier Senosiain ferrocement houses and structures

Javier Senosiain (born 1948), a Mexican architect who is the key exponent and also one of the first explorer of so-called organic architecture. His works have the same basic nature inspirations to other bioarchitecture architects like Frank Lloyd Wright, Bruce Goff, Paolo Soleri, Friedensreich Hundertwasser, Buckminster Fuller, Antoni Gaudi and Rudolph Steiner.



Currently working as a professor of architecture at UNAM, the National University of Mexico, Javier Senosiain's architectural creations have attracted both comment and controversy. His own house for example, located at Vista del Valle, north of Mexico City sits on a hill overlooking to the city and designed in the shape of a shark.



The idea is to recline," says Senosiain, "like an animal in a cave." Built in a ferro-concrete construction coated with polyurethane and UV-resistant elastomeric waterproofing. Inside it comprises a complex labyrinth of rooms and interconnecting carpeted tunnels. Javier Senosiain Aguilar's house returns to all things natural.

(Cont from page 1)

A mason shapes

Green Buildings

Ulaganathan constructs buildings with red sand, ferro cement and clay bricks. Fixing the locally available wooden planks for pillars, he blends the cement with limestone for the flooring. Coconut fibre, iron waste and blue metal are mixed up to lay the ceiling. Planting trees, making rainwater harvesting structures in the houses are important, he says. Ulaganathan entered Auroville, the universal, eco-friendly and spiritual township of Puducherry, for work.

"I was working with construction experts as a daily wage labourer. I didn't have any idea about eco-friendly buildings. But, during the construction of Auroville green buildings, I had on-the-job training from the architects and trained masons there," he said. After gaining knowledge and experience in building eco-friendly houses, Ulaganathan started working on projects on his own in 2004 with just three chithals. He recalled that he was paid `3 a day in 1984.

"Now, I pay Rs 340 to each of the over 20 workers who are under me," he said. He added that his own house is a complete green building. "Even in cities like Chennai, you can construct a green building on 400 sq ft on a Rs 5 lakh budget," he says confidently. "Though many of my relatives are middle-class families, I managed to build 'green' houses for them with their modest investment," he said. He added that he has built over 50 green buildings in the last decade. Ms Vimla Bruno, owner of a 1,000 sq ft green building in Lawspet, constructed by Ulaganathan in 2007, said, "Our house is cool and clean, compared to other houses in our locality. The plants around the house keep the place cool." Architect Pallavai Nath of Auroville said, "It's possible to have a budget building in Chennai for Rs 5-7. The presence of trees near the house reduces the inside temperature. Hot air goes out and cool air spreads in our rooms."

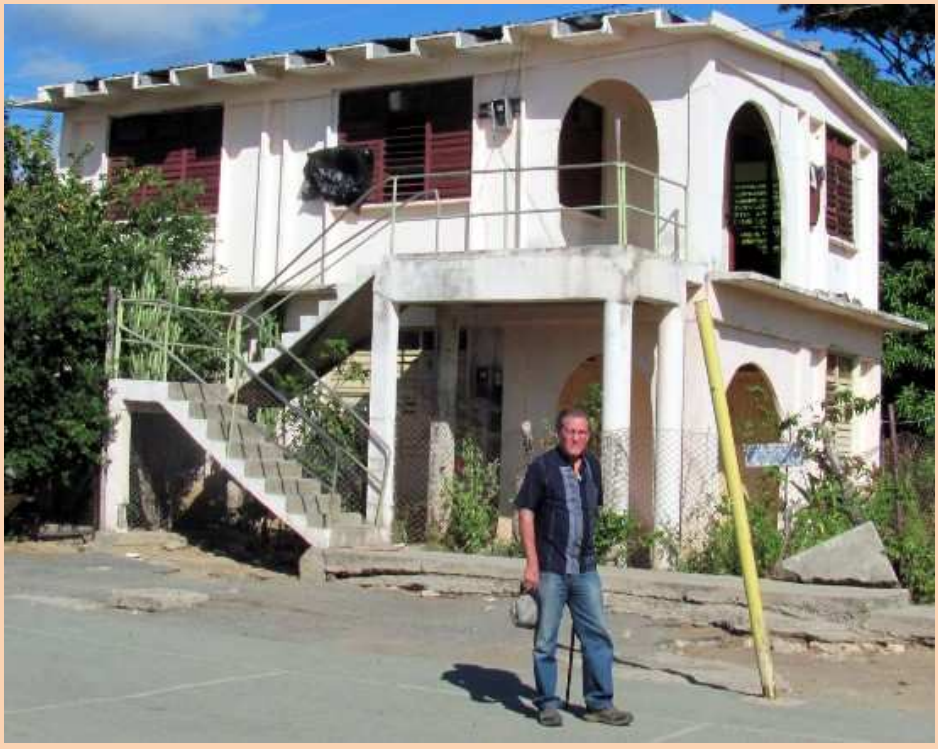
Engg Students in Sangamner in demo.

(Contd from page 1)

Ferrocement panels gain acceptance

Pedro Galiano, a senior Cuban Architect proudly presents the first of a series of two-storey houses in the Dominican town of San Francisco de Macoris. Galiano is a pioneer of this construction technology and former president of the Cuban Union of Architects and Engineers (Union de Arquitectos e Ingenieros de Cuba, UNAIC), and since his retirement he has been consulting the Municipality of San Francisco. Among his many projects is the installation of a production facility for ferrocement panels and the construction of some buildings. Now he has started a small colony of social housing with a local developper. At the same time he is also a consultant to the programs of Sofonias Haiti* and he will supervise the installation of the second level panels in the community centers built for UNDP.

This technology originated in the 80's when a group of (then young) professionals were seeking to lower construction costs and provide efficient technologies in a decentralized manner. Guided by Hugo Wainshtok who had been building boats and floats with ferrocement, they embarked on this novel use of ferrocement, a technology often used to build gigantic egg-shaped roofs. Recently some of the houses built in those days have been visited and published as case study in the UN-publication "Going green: A Handbook of Sustainable Housing Practices in Developing Countries"



The Haitian partner of the EcoSur Network has been building shelters with the panels since the earthquake and with support from UNDP they are starting the construction of two community centers in destroyed areas in Port au Prince. This type of construction can be locally prefabricated and then assembled within a very short time, a great advantage when rebuilding in densily populated areas. The project is teaching a group of 30 people, mostly women, to produce and build with this technology.

From October 12th to 17th, the Cuban branch of the International Ferrocement Association, headed by Dr. Hugo Wainshtok, organizes its 10th World Summit in the Palacio de Convenciones in Havana where interesting presentations are schduled. There will be much debate about the use of different fibres and meshes, to modernize the old technology towards more sophisticated industrial processes, but also reports on more humble and simple applications like the three presented here.

Meeting of the Board of Directors of the International Ferrocement Society (IFS)

During the Symposium, the Board of Directors of the International Ferrocement Society (IFS) met twice. The new president for the next three years was appointed and the next venue for the next FERRO 11 was selected.

Another important agreement was the revitalization of the technical journal, *Journal of Ferrocement*, which is expected to be posted online. Thus, the Board of Directors decided to use the papers presented at the Symposium and published in the FERRO 10 Proceedings to prepare the first issues of the journal.

X International Symposium in Ferrocement and Thin Reinforce Cement Composites (FERRO 10)

VI Latin-American and Caribbean Conference on Ferrocement
Held in Cuba

Report by Engineer Hugo Wainshtok, President of the International Ferrocement Society (IFS) 2012-2015

After two years of preparation, we finally held FERRO 10.

The Organizing Committee and many of the delegates believe that FERRO 10 more than fulfilled its objectives. More than 150 delegates from 28 countries attended. Many of them also believe that the technical level reached was the highest so far. For Cuban and Cuba in general, FERRO 10 represented a new beginning, a new perspective about the use of this technology and many new ideas to implement.

Therefore, we obtained from the Ministry of Construction and other sector authorities who attended FERRO 10 their support commitment, which we the professionals in the Unión Nacional de Ingenieros de la Construcción de Cuba (UNAICC), who sponsored the event, gladly accept, so we can use what we learned in order to improve the works and develop new applications for this technology that may be widely used in the country's constructions.

To the International Ferrocement Society (IFS), that sponsored the Symposium together with UNAICC, and the members of its Executive Bureau, our acknowledgement for their support in the organization of this activity and for their advice and promotion.

And to all of you, dear colleagues, our appreciation for your presence; in particular, to all those who through their papers made it possible to achieve such a high technical level at FERRO 10. We hope that you enjoyed your stay in Cube and that FERRO 10 will become a meeting point so we can meet again. To all, our sincere recognition for your attendance; we hope to see you again in our next International and Caribbean Ferrocement Conference in 2014, or at FERRO 11 to be held at the University of Aachen in Germany in 2015.

Applications of Ferrocement in Cuba

The event showed examples of homes that were built with ferrocement roofs and still maintain its good condition

During the opening of the second day of the International Symposium on Ferrocement FERRO 10, the president of the organizing committee, Engineer, Hugo Wainshtok Rivas, presented dozens of examples of the durability of this technology after decades of application.

In Cuba, in the 1990s, with the Special Period, the widespread use of ferrocement was truncated. However, many works prior to this stage are still preserved in good condition, as stated Wainshtok. Such is the case of Baconao Park in Santiago de Cuba.

In 1982 the place was opened with more than 100 large pieces by sculptor Dagoberto Moreno. At present, all kept in good condition.

The same applies to the pools. "In 1984 it was designed and built the first pool of ferrocement in Cuba, in Villa Loma, Jibacoa beach, now Mayabeque province.

It has 25 x 12.5 m and its deepest part is of 1.80m deep, with a thickness of 25 mm in the walls formed with prefabricated panels and 20 mm deep concrete in the place. The total cost was nearly seven times lower than a concrete one of equal size," he said.

Similarly, the specialist showed examples of homes that were built with ferrocement roofs and are still in good conditions.

Haiti reconstruction with ferrocement impresses UNDP

High ranking visitors to a newly started production unit in Port-au-Prince (Haiti) congratulated the manager of the local EcoSur partner for an impressive start into a new project which aims to form micro-enterprises to produce construction materials for the country's reconstruction. Helen Clark, the former Prime Minister of New Zealand and actual administrator of the United Nations Development Program (UNDP) expressed her satisfaction at the high quality of walling and roofing elements produced by the women and men of the workshop in a neighborhood badly damaged by the 2010 earthquake.

Starting March 2012, Byron Lopez, from EcoSur partner "Sofonias Ayiti" (Kreole for Haiti), received the green light to initiate this project as part of the local UNDP program. He met with 60 preselected people of "Canapé vert", a neighborhood in downtown Port-au-Prince and selected 20 women and 10 men to learn the production of ferrocement panels and later how to build low cost safe houses. The project aims to empower women to run their own businesses, but without excluding men, and as construction is a traditional male domain and involves hard labor, this gender mix seems ideal.

Helen Clark (white hat) Haiti director of UNDP, Jessica Faieta (orange hat) and Byron Lopez (green), manager of Sofonias-Haiti

There are different tasks to be done in such a workshop, some of them involve a medium educational level, others are less demanding in this respect, but demand strong bodies. For all of them there is one common denominator: quality.

Training and education program

This project will concentrate on preparing the 30 "apprentices" to produce good quality panels and to assemble good houses. This involves a tough program of manual labor, mixing concrete, pouring and curing the panels, demoulding and moving them around.

Ferrocement is a technology that was first used in France in 1848, and later was popularized through roofs that span more than 100 meters, like the ones built by Nervi in Italy 60 years ago. The idea to produce small size panels was born some 30 years ago in Cuba and applied in a few housing developments.

EcoSur partner sofonias Nicaragua redeveloped the technology and in the last years more and more projects are using it successfully.

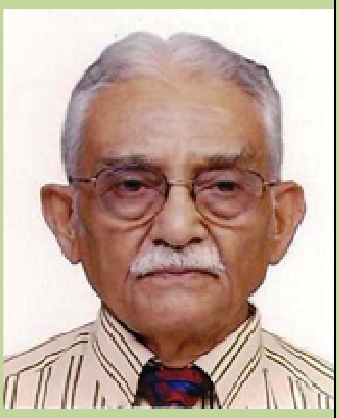
Quality is easy to control

Many housing programs in developing countries suffer from low quality, often due to low level of instruction of the builders and of the material producers. This is a problem specifically acute in Haiti, and the large demand for construction since the earthquake has made this worse. The ferrocement walling and roofing elements are stable within themselves and span up to three meters, they cover a wall section from the foundation to the ring beam and do not need any other structural elements. As they are produced in a supervised environment, their quality can be controlled. The surface of the thin but strong elements is smooth and can be painted to give a happy look, no plastering is needed.

The assembly of the elements on the construction site is easy and fast, therefore very well suited for post disaster reconstruction, for urban environments and also for slum upgrading. Sofonias has built solid ferrocement shelters in Haiti and also hundreds of sanitary units (dry toilet and shower) using ferrocement panels. Several reports have been published in former issues of the E-magazine.

Ferrocement for future generations

The most significant contribution of ferrocement is that most of the structures made of steel can also be constructed in ferrocement, claims J.A. Desai, Managing Director, J.A. Desai Ferrocements Pvt. Ltd



Corrosion is the phenomena which causes deterioration of steel. The menace of corrosion has been increasing along with the increasing use of steel for various purposes such as building and construction, automobiles, shipbuilding, transmission line and telecommunication towers, substation structures, bridges and jetties, irrigation structures like gates, water supply lines and pipes. This is a negative aspect of the use of steel. However, there being no other alternative, the same has been accepted with the provision of corrosion resistant treatment such as painting, galvanising, epoxy powder coating application etc. Steel is being used so widely that mineral resources are depleting fast.

As a remedy, a wide range of corrosion protection systems have been developed. These are not permanent and have to be applied again and again, causing recurring expenditure. In India, the cost of prevention of corrosion and management is estimated at Rs 1.5 lakh crore every year. In spite of these anti-corrosive treatments, corrosion does take place and basic structures have to be replaced at certain intervals of time. Similarly, the cost of corrosion in USA is estimated at $276 billion every year. Against all these odds, a material called ferrocement has been developed, and it helps prevent corrosion. The most significant contribution of ferrocement is that most of the structures that are made of steel can also be constructed in ferrocement. Structures constructed in ferrocement will resist corrosion fully with nil/negligible maintenance. Ferrocement section in form of 'I', tee channel or angle as in case of steel can be manufactured with many added advantages. Even ferrocement anticorrosion treatment can be carried out effectively on existing steel structure surfaces. Such coating done in the UK has lasted over one-and-a-half decade.

Ferrocement structures, as alternatives to steel structures, will resist urban polluted atmosphere to a large extent. Where there is severe acidic atmosphere, low-cost treatment should be sufficient. There are instances of ferrocement structures lasting for about eight decades or more without any maintenance. Ferrocement is also an environment-friendly material.

Ferrocement structurals are just the replacements for steel structurals used in industrial structures for pharmaceuticals, chemicals, warehousing, refinery, thermal power, irrigation, treatment plants and other industries. Steel used in marine structures such as boats, ships, barges, tugs and docks can also be replaced with ferrocement structurals. Regarding marine structures such as boats, the United National Industrial Development Organisation praised ferrocement in its publication 'Ferrocement Boats' as early as 1972. In short, wherever steel is used in civil engineering and other industries, ferrocement structurals can be used with great advantage with regard to corrosion and cost reduction.

Ferrocement has been in use for about 50 years for construction of boats, ships, roofs, irrigation structures like gates and other allied structures as well as houses, swimming pools, bridges, walkways, jetties and water storage tanks. Lakhs of square feet of ferrocement plates have been constructed and used in water storage structures, roofing etc. Ferrocement structurals such as RSJ, channels and I section have been used in construction.

Use of ferrocement will result in saving in cement and steel to the extent of 50 per cent in building and other allied industries. At the same time, the structures constructed with ferrocement will be more efficient, durable, strong and maintenance free. This will be an added saving in the economy in addition to saving in huge cost of corrosion management and prevention. Ferrocement structures last much longer than similar steel structures.

The use of ferrocement will reduce the requirement of raw materials such as iron ore for steel and limestone etc., for cement. Ferrocement can also contribute in light of the recent debate on banning the export of iron ore, which is depleting very fast. Cement manufacture is also being modified so as to use less limestone. As such, ferrocement will be a boon to the nation as well as future generations.

How does ferrocement prevent corrosion?

Ferrocement surfaces have wire mesh layers. This wire mesh prevents crack formation at the surface of the ferrocement and travels further deep into the material. Ferrocement has a crack-arrest mechanism and is a denser material compared to concrete with hard surface. Structures like ferrocement pools, walkways and jetties are constructed using ferrocement footings, beams, columns, floors, walls, roofs, decks, railings etc., and a lot goes into the manufacture of beams, columns, floors etc.

In terms of cost, how does it compare with steel and cement?

It can be said that ferrocement is generally costly, but sometimes on job-to-job basis, it turns out cheaper. Ferrocement is competitive considering the lifecycle cost with least maintenance. Being a structural material, it should be compared with structures like reinforced cement concrete, prestressed concrete structures or steel structures.

How does ferrocement help lower the requirement of raw materials, as in iron ore for steel and limestone etc., for cement?

Ferrocement is a strong material and so a small quantity of ferrocement replaces a large quantity of RCC. Ferrocement structures consist of less steel and high-quality cement matrix with certain manufacturing techniques. As a result, the requirement of steel is reduced considerably but the end result and durability is same. There is also saving in mineral ores. I anticipate that existing steel plants producing structural steels like joists, channels and angles will be modified to ferrocement structural producing plants in future, say, in five to 10 years.

If ferrocement has so many advantages, why is it not popular in construction?

We have come across a large number of engineers and architects who also wanted to know that if ferrocement had advantages, then why it was not replacing steel and cement to a large extent. Our answer was that if they were convinced about this material then they should adopt it in actual practice. But they have not done so. There are also some professionals who, without a proper study of the product, have said that ferrocement was not a good material. The main reason is that they compare ferrocement to RCC.

Kerala Assembly uses Ferrocement

for solar power and Rainwater harvesting

THIRUVANANTHAPURAM-

The abundant sunlight and rain that pours down on the Kerala Assembly will no longer go to waste. The Assembly complex will soon sport six large reservoirs for holding rainwater and solar panels atop the roofs for trapping solar energy.

Every year, millions of litres of rainwater flows off the roofs of the Assembly buildings. To stop the water from going waste, the Assembly is constructing six reservoirs with a total capacity to hold 15,30,000 litres of water. Of the six, three have a capacity of five lakh litres each and the other three, 10,000 litres each.

The bigger reservoirs are coming up at the Assembly block, Administrative Block and the New Legislature Museum. The quarters of the Speaker, Deputy Speaker and the Assembly Secretary will sport the smaller ones. Ferro cement technology is being used to construct the tanks, Speaker G Karthikeyan's office said.

The Legislature Secretariat Complex has 11 buildings in all. The Assembly is also planning to install an interactive solar photovoltaic power plant with a capacity of 400 Kilowatt Peak (KWp) on the roofs of the administrative block and the hostel block. The Legislature Secretariat has invited EoI from firms for this project. The power plant will meet part of the internal electricity requirements, supplementing the grid supply of the Kerala State Electricity Board (KSEB).

''We are already in the process of replacing old electrical equipment with energy efficient ones. For instance, incandescent bulbs are being replaced with CFLs. We have been able to save 10,688 units of electricity through this measure,'' a senior official attached to the Speaker's office said.

The Kerala Assembly was one of the 22 government buildings that underwent an Investment Grade Energy Audit in June 2010. The Energy Management Centre (EMC), which conducted the audit, had recommended a series of measures, including the introduction of energy efficient equipment for bringing down power consumption.

Member of Ferrocement Society in Kerala
Biji John (ferrotechnologies@gmail.com)

The Assembly complex will soon sport six large reservoirs for holding rainwater and solar panels atop the roofs for trapping solar energy.

UGANDA –use of ferrocement

The Church of Uganda Teso Dioceses Planning and Development Office (COUTEDDO) Water, Sanitation and Hygiene (WASH) programme is implemented as two projects all in the districts of Katakwi and Amuria in partnership with WaterAid Uganda and the respective District Local Governments. The projects are:

- The Post Conflict WASH project implemented with support from the European Union Water Facility in Orungo and Morungatuny sub-counties in Amuria district; Ongongoja, Ngariam and Magoro sub-counties in Katakwi and runs for five (05) years 2011-2016; and
- The Integrated WASH project implemented with support from Guernsey in Obalanga in Amuria district and Palam in Katakwi district and funded on a yearly basis.

Key Achievements

Provided clean and safe water for communities that used unsafe water

33 boreholes drilled in 33 poorest and post conflict communities in Katakwi (16) and Amuria (17). About 13,813 people are now accessing clean and safe water in the respective communities in Katakwi (10) and Amuria (09) districts.

COUTEDDO has also rehabilitated of 19 boreholes in Amuria (09) and Katakwi (10) districts in a bid to improve on functionality of existing water points.

Promoted rain water harvesting in institutions and households

18 Ferro cement tanks have been constructed in 8 underserved primary schools in Katakwi (09) and Amuria (09). 3,600 pupils have been supported to access clean and safe water for hand washing and maintaining hygiene in their schools.

29 rain water jars have been constructed for selected vulnerable households in Katakwi (12) and Amuria (17) districts. COU-TEDDO is working with local artisans to construct the rainwater harvesting tanks. As a member of the Uganda Rainwater Association support was sought for training of the artisan groups which has ensured quality of works.

Propagation of Ferro Cement Technology in ODISHA

This Technology was introduced by Samajik Seva Sadan in the year 1988 with the patron-ship of Mr. S. B. Agnihotri (IAS), the Collector & District Magistrate of Dhenkanal. With his kind efforts we could get a project from CAPART for propagating this technology throughout Odisha.

They designed various types of roofing panels, water tanks of different designs and capacities, doors and windows and trained 108 Ferro Cement Masons and 15 Junior Engineers of different Govt. and NGO sector. They assisted in making Ferro-Cement manufacturing units at Sarsokana Block in Mayurbhanj, ITDA, Kaptipada, Sarsokana Block and CDA, Bidanasi in Cuttack. NGOs such as Gram Vikas, SAMBHAB, AGRAGAMEE, JAGRUTI and PREM established their own manufacturing units after their Masons and Engineers were trained at Samajik Seva Sadan.

Central Institute for Fresh-water Aquaculture (CIFA) near Uttara Chhak, Bhubaneswar came to know about our innovations of Ferro-Cement Water Tanks invited us for a demonstration. Today more than 200 Ferro-Cement Water Tanks of various design and capacities up to 5000 liters can be seen used by them for Hatchery, Perl-culture and for various experiments

Samajik Seva Sadan is committed to promote, facilitate, conduct and co-ordinate development activities in professional and scientific manner aiming at the sustainable development specially that of the Tribals and Dalits in Target Area. According to SSS conceptualization, all the anti-poverty programmes thereto culminate into self propelled community processes with 'Justice to Fellowman and sustainable management of Natural Resources'. In every respect the Organization stands committed to the Sustainable Development of Target Population.

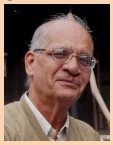
Promoted by ACC | FS

SANITATION SOLUTIONS COMPETITION

Public Toilet design competition organized by ACC and Ferrocement Society- Visit www.fs2013india.com

FERROCEMENT SOCIETY

New Managing Committee for 2013-15



Dr. B.N.Divekar, President


Chandra Mohan Jayant Patankar
(Vice Presidents)



Sonali Patil Hemant Dhonde Girish Sangle
Treasurer Project coordinator Hon. Secretary

Managing Committee Members





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V.R.Phadke N.P.Salvi R.K.Ambegaonkar Ulhas Adhav

2nd National Convention on Ferrocement

Rajendra Pawar, Convener



Kiran Kalamdani Antony Jeyasehar S.S. Pimpalikar
Co-convener Co-convener Co ordinator

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