



Ferrocement Society's

# Ferrocement News

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**FERRO10**


## “participate in the Symposium” -Hugo Wainshtok

FERRO10 is part of a continuing series of Symposia started in 1979 with a special focus on the research, development and applications of ferrocement and thin reinforced cement composites. These are essentially reinforced concrete products with a thickness typically less than about 50 mm and encompass thin fiber reinforced concrete as well as thin textile reinforced concrete products. Since the first symposium, continuous developments have occurred in new materials, processing, standardization and improved products for both marine and terrestrial applications.

The main objectives of this symposium are: to provide a compendium of up-to-date information on the latest development and research

advances in the field of ferrocement and thin reinforced cement composites; to allow a forum of world specialists to share their knowledge, experience and vision; to foster collaboration and technical exchanges between researchers and practitioners nationally and internationally; to identify current technical gaps as well as immediate research needs; and to suggest directions to follow in the near future.

Dr. Ing. Hugo Wainshtok Rivas President Organizing Committee has requested to participate in the Symposium.

### HAVANA conference center,

October 12-17, 2012

HAVANA, CUBA

For details visit-

[www.ferro10.com](http://www.ferro10.com)

### TOPICS OF THE SYMPOSIUM

#### I. Research and development

- Current State of Progress
- Materials and technologies
- Durability
- Structural behavior and design

#### 2 Ferrocement of the future

- The use of special cements, polymers and resins in the matrix
- The use of new types of reinforcements : fiber reinforced polymers (FRP), textiles and natural fibers

- The use of non traditional materials, new applications

#### 3 Ferrocement in natural disasters

#### II. Practical applications

- 1 Housing, swimming pools, vessels, monuments, tanks (individual or per country)
- 2 Special applications

### Special points of interest:

- FERRO-10
- National Conference-report
- Workshop at Chennai
- Ferrocement lining to farm pond.
- New life members



Dr. P.B.Sakthivel welcoming Dr. B. N. Divekar, President, FS, Dr. P.Paramasivam and Dr Poornachandra, Principal, JCE, Chennai, Dr. Neelamegam, Dr. B. Vidivelli, Chennai

## ONE - day FC Workshop at JCE - Chennai

The Workshop was jointly organised on 22<sup>nd</sup> July, 2011 by Ferrocement Society and Jerusalem college of Engineering (JCE), CHENNAI.

Dr. P.Paramasivam's presentation was very informative. He impressed upon the application of Ferrocement which are normally used as secondary roofs in Singapore. There is a low cost housing concept for which Government of Singapore spent money. Use of ferrocement in precast sunscreens and other building components has proved cost-saving in buildings. Cellular concrete 50mm thick is now being

replaced by ferrocement with 30 thick panels through interlocking system. Precast industry is making millions of dollars. While discussing case studies of ferrocement, Prof. Paramasivam mentioned that stainless steel water tanks on the buildings are now being replaced by ferrocement tanks in Singapore. Impact resistant doors are also tested for blasting effects. In tidal zone ferrocement vertical sea wall along the sea protects the bank. In Trivandrum, a floating restaurant with ferrocement is built. He also showed the photos of Yugoslavia terrestrial structures, Zoo entrance

in Indonesia and low cost houses in Malaysia. He also brought out that only mosque built out of ferrocement survived in the tsunami in Indonesia

The demonstration of ferrocement technique was arranged at the central open space of the college building. The skeleton with weld mesh and chicken mesh layers tightened on it was explained to the participants by Dr. Divekar. He showed the mortar and the filling method of mortar while Dr. Neelamegam assisted him. Students also tried the filling process using cement mortar. ....(more on page 3)



Ferrocement door made by Dr. Jagannath at Podicherry engineering College, India



Largest Solar Kitchen in South Asia at Auroville, India Solar collector is made with ferrocement.



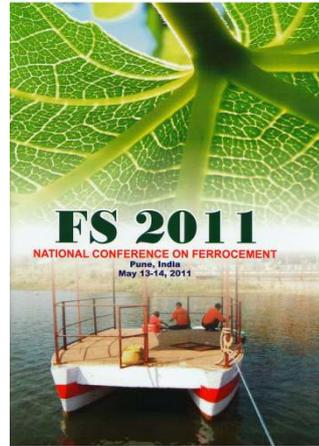
Ferrocement component casting yard at CSR Auroville, near Puducherry. Width is 14 metre and the height is 7 meter. Many ferrocement structures implemented by Auroville Centre for Scientific Research (CSR) are testimony of durability of the ferrocement technology

## FS-2011 NATIONAL CONFERENCE ON FERROCEMENT

Pune, India, May 13-14, 2011

*The first National Conference on Ferrocement was organised in Pune, India on May 13-14, 2011 by the Ferrocement Society, Pune, India. The objective was to provide a forum to architects and civil engineers to present and discuss present and future applications, projects, research and developments of ferrocement technology.*

Professor P. Paramasivam, Professor Fellow, Department of Civil Engineering, National University of Singapore delivered the Keynote address. Other enthusiasts presented papers on advances made in science, technology, research, and application aspects of ferrocement. These topics were discussed in 34 papers grouped in six different themes of the proceedings. The first theme covered general aspects of ferrocement, and its potential in rural areas. The second theme of materials included experimental work carried out for evaluating innovative applications possibilities such as strengthening masonry columns, geo-polymer mortar etc. The third theme was based on application in building both pre-fabricated and in-situ applications. The papers in this theme highlighted the do-it-yourself home construction potential of ferrocement. The fourth, fifth and the final sixth themes were for space structures, special applications such as waterproofing of RCC structures and architectural applications of ferrocement respectively. To make the proceeding compilation more



comprehensive, select articles published in select journals and conferences were included for the benefit of readers.

About 100 participants from different parts of the country attended the conference. A leading cement company, a construction company, and a couple of journals including this journal were conference's co-sponsors.

It was agreed that an unprecedented range of new technologies and a large market for housing products in India could change the manner in which ferrocement is used today. Advances in binder materials' technologies and reinforcing elements could open up new possibilities of ferrocement applications than envisaged so far. The conference noted that the use of additives and admixtures could lead to denser matrix and provide even greater protection to reinforcement than before. It was acknowledged that one of the most pressing needs was to develop a model code for

ferrocement to help the structural engineers to consider its use in construction.

*Conference's activities included a visit to a construction site at Talegav 40 km from Pune where the work with hollow beams and lost form work made of ferrocement was appreciated by all. Dr. Divekar, President, Ferrocement Society, explained about the patented innovation and the actual use of these techniques in a five storeyed Engineering College building. Dr. Divekar's residence is also built with ferrocement cavity walls.*

A panel discussion on standardisation and code for ferrocement was anchored by Mr B.V.Bhedasgaonkar, the convener of the conference. Dr. P. Paramasivam, Dr. B.N. Divekar, President, FS, Pune, J.A. Desai, CEO, JA Desai Pvt Ltd, Ravi Ranade, Director, Construction diagnostic Center, Pune, Prof. A.G. Joshi, Stuctural Consultant, Pune, T.P. Singh, Director, Construction Research Center, Delhi and Architect Kiran Kalamdani, Vice President, FS, Pune participated in the discussions.

### Coconut shaped Temple



Nashik- A temple having a shape of coconut is being constructed near Dadawadi area of Nashik. The architect famous for innovative designs Mr. Chordiya has decided to construct the temple using ferrocement only. The coconut will rest on a plinth on the ground. It has a height 52 feet and maximum diameter 42 feet. Shri chakra will be installed on the top of the temple. The design is quite off beat and a challenge to the engineers.



**Chennai Workshop(Contd)**

Dr. B. Vidivelli explained various tests on ferrocement and the formulation of methodology for rehabilitation of the beams. Performance of the beams were evaluated by the factors  $f_1$ (energy approach) and  $f_2$ (deflection approach). Ferrocement laminates can increase the flexural strength of the beams by 21 to 26 percent.

Dr. M. Neelamegam, former Director-Scientist, SERC-CSIR, Chennai and currently the Professor & Head of the Department of Civil Engineering, Easwari Engineering College, Chennai explained polymer ferrocement composites where



polymer forms one of the ingredients of the matrix. He said polymer ferrocement composites are very cost effective in applications requiring high degree of durability and chemical resistance and quick repairing works. Stainless steel and other steels can be replaced by this method in building

industry. He expected the engineers to frog-leap in the beneficial use of polymer ferrocement composites.

Dr B. N. Divekar explained the all-in-one method for which he has got patents. He explained the advantages and construction details of the cavity wall, floor construction. He said

there is huge potential for the precast industry for the fresh engineers after their graduation for becoming entrepreneurs instead of searching any employment. Er. Prakash Nagnath, Pune base ferrocement techie explained the potential of ferrocement precast industry.

The workshop was fruitful as the students gained a new area where they have a chance for becoming an entrepreneur and starting a small business or taking-up contracts using the above ferrocement technology instead of a job.

**Engineering Colleges may contact us by email for organizing a workshop.**

**Proceedings of FS-2011 available for sale**

**An appeal to all ferrocement Technologists.**

**Ferrocement Society** (Pune), India is a non-profit making organization of Engineers and Architects who are keenly interested in propagating this technology to the grass-root level.

The society members are organizing training programmes and demos for the upcoming engineers and entrepreneurs, take part in exhibitions like CBX and Constro, present papers in conferences, sponsor research projects in Colleges for graduate students offer consultation in design and construction of ferrocement structures and encourage engineers in developing newer ideas and techniques.

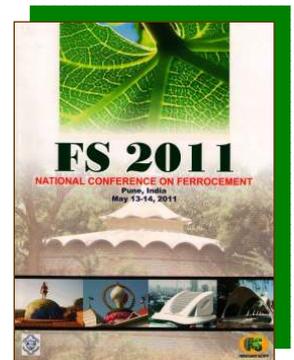
Few interesting techniques developed and used by us are ferrocement cavity walls, hollow floors, hollow beams, arch faced soil retaining walls, petal tanks, stiffened walling and floor plates for mass scale housing, 'All-in-One' method of construction (patented) in which walls, floors and RCC framework are cast simultaneously and integrally to make it an ideal system for earthquake resistance, ferrocement as lost formwork which acts as structural member also, etc.

Many innovative structures are built by our members like,

- Ferrocete silo 8.0m dia x 15 m high without use of slip forms,
- Egg-shaped conduit 3.6m dia and 210 m long to divert a natural stream through it
- Pumpkin shaped domes 12m dia. And 6 m high,
- Arch faced soil retaining wall, 6m high, 100m long with wall thickness 80mm only
- Ferrocement Petal tank, capacity 1200 cubic m, 18m dia and 5m high with wall thickness 75mm only.
- Gigantic cylindrical shell 30m long and 8m dia at 14m height,
- A college building is under construction, 4 floor each 3000 sqm, with ferrocement units as lost formwork in form of structural elements.

Ferrocement Society had organized a National Conference FS 2011, in Pune (India) in May 2011. 36 papers were presented by research workers in India. The proceedings can be purchased at a price of INR 1000 only.

Contact- ferrocement@gmail.com.



Margarito Ortiz Gumán from Oaxaca, Mexico has built a 6m high and 27 m wide ferrocement dam in 2010. The thickness is 50 mm. The dam is useful for drinking water, irrigation and to recharge the water table in arid area.

**The University of Nottingham UK**, is tackling the problem of sustainable lightweight construction materials. Current studies focus on *ferrocement* panels. These use wire-mesh reinforcement within a special cement mortar to provide unique potential for rapidly deployed shelters, emergency housing and secure accommodation which offers protection from fire, blast and seismic attack. Blast protection for structures under direct or indirect threat from explosive hazards often requires retrofit solutions with minimal or temporary environmental impact whilst providing structural shielding from shock waves and shrapnel and spall fragments. These situations include structures under direct assault or in post-conflict areas where unexploded ordinance pose a continuing hazard. *Ferrocement* paneling provides a modular and effective passive solution. The incorporation of continuous steel wire reinforcement lends a pseudo-ductility under impact loading which boost structural integrity compared with conventional reinforced concrete and concentrates damage at the impact zone. Splinter penetration is minimal through the thickness of such slabs and short range proving tests with 7.62mm rounds have demonstrated excellent damage tolerance for relatively low density installations.

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*Ferrocement Society is the registered trust and a registered society working for last two years. The main object of the society is to promote the Ferrocement technology. Professionals in Ferrocement, engineers, contractors, architects, academicians, students, companies, institutes can become member of the society. Introductory workshops are conducted by the society on request all over India. Conferences and seminars are also arranged. Informatory books and videos are also under preparation. People are welcome to work voluntarily in this society.*

Become a Life Member of this society

**We are on the web**  
**www.ferrocementindia.com**



**Dr. M. Neelamegam**  
He is BE (struct) from Annamalai University, ME Struct 1991 (Annamalai Uni) and Ph.D. 1998 from Nihan Uni, Japan. Presently he is Scientist "G" since 1977 in CSIR-SERC, Taramani, Chennai. Now Heading the Civil Engineering Department in Easwari Engineering College. He passed ME from Anna University and Ph D from Nihon University, Japan. He has done extensive research in Polymer ferrocement composites.



**Sadatchara Mourthy Nagalingam** is consulting Civil Engineer and Proprietor of Honey Designer and Builders, Pondicherry. He passed M.Tech in 2001 from Pondicherry University. He is also a life member of Indian Concrete Institute.

## Welcome New life members



**Dr. Shoba Rajkumar** is Associate Professor, Govt college of Engineering, Bargur, Tamil Nadu. She passed ME Structures in 1999 from Madras University. She is Ph.D. in ferrocement from Anna university, Chennai, India.



**Er. Dinesh A. Patel** is a Civil Engineer in Gujarat Narmada Valley Fertilisers Company at Narmadanagar Dist Bharuch, Gujarat. He also served as Assistant Engineer in Irrigation Department. He is also a member of IEI and Indian Concrete Institute.



**Himanshu Parikh** is BE civil from Jaisingpur College. He is consulting Civil Engineer and structural designer at Sangli, Maharashtra. He is a Project Management consultant and member of IEI, Engineers and Architects Association.

### Ferrocement Lining to Farm-Tank

Er. P.V.Patil, used ferrocement for stopping the leakage through the masonry walls of the farm tank having capacity 7.5 Million liters. Since 1993 there is no leakage thereby saving millions liter water.

The tank (see photo above) in his village Kundane, Taluka and district Dhule in India has length 80 m, width 17 m and height 6 meter. The undulating surface of the masonry was covered by cement mortar. Then chicken mesh with 6mm skeleton steel bars were fixed by nailing. After applying the mortar on the chicken mesh Er. Patil took precaution not to expose the cement surface to sunlight. Total thickness achieved to have a plain surface was 75 mm. The sand used by him was available locally. In 1993, Patil says that he could do this work at a rate of Rs 0.25 per liter when cement bag of 50 kg was costing Rs 50 only.

The ferrocement is useful in rural area as the farmers can do this themselves thereby saving cost on labour. Er. Patil is retired Secretary to Government of Maharashtra.