



बुनियादी ढांचा, आवास, कक्षा (घर) और नई तकनीकें
विकास, आर्थिक स्थिति में सुधार; और निर्माण
BUILDING MATERIALS & TECHNOLOGY PROMOTION COUNCIL
Ministry of Housing & Urban Poverty Alleviation, Government of India

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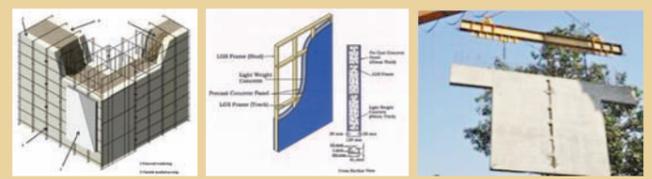
Implementation of Performance Appraisal Certification Scheme (PACS)

Under PACS, preliminary applications for the following new technologies were received during the period:

1. Sismo Building Technology from M/s M K S Info-solutions Pvt. Ltd., Manesar (Haryana)
2. Light Gauge Steel Frame Structure with Infill Concrete Technology from M/s Society for Development of Composites, Bangalore
3. Precast Large Concrete Panel System from M/s L&T, Bangalore
4. Rapid Panels from M/s WorldHaus Construction Pvt. Ltd, Bangalore
5. Stay- in-Place Formwork System of M/s Coffor Construction Technology India, Vadodra
6. Dry Wall Insulated Panels of M/s E-Pack Polymers Ltd., Greater Noida
7. Structurally Insulated Panels of M/s Pioneer Fabricators Pvt. Ltd., Meerut
8. Precast Concrete Panels from M/s Shree Precast (I) Pvt. Ltd., Mumbai

After due evaluation of Detailed Application Forms (DAF), the relevant details/documents for processing the applications were examined and inspection visit to the manufacturing units were made. After preparation of draft PACs, same were sent to the Technical Assessment Committee (TAC) for their comments. The Technical Assessment Committee in their meeting held on March 10, 2016 approved the following technologies for award of Performance Appraisal Certificates under the Chairmanship of ED, BMTPC:

1. Sismo Building Technology
2. Light Gauge Steel Frame Structure with Infill Concrete Technology
3. Precast Large Concrete Panel System
4. Rapid Panels



Open House Discussion on Technology Sub-Mission under Pradhan Mantri Awas Yojana - Housing for All (Urban) Mission

The first Open House Discussion on the Technology Sub-Mission under Housing for All (Urban) was organized by BMTPC on March 11, 2016 in New Delhi under the chairmanship of Shri Rajiv Ranjan Mishra, Joint Secretary (Housing), MoHUPA. Meeting was attended by the representatives of the States and IITs & NITs to facilitate discussions relating to the Technology Sub-Mission and use of new technologies for mass housing, system used in inviting tenders, hindrance in adopting new technologies, support needed for implementing new technologies for projects under HFA etc. It facilitated interaction of IITs/NITs with the state officials with regard to the technical support these institutions can provide in the areas of identification & vetting of technologies, design, testing, quality assurance, monitoring, DPR preparation etc. In the Open House discussion, representatives from the states of Jammu & Kashmir, Rajasthan, Tamilnadu and Madhya Pradesh participated. From the institutional side, IIT Madras, IIT Bhubaneshwar, NIT Surathkal, NIT Hamirpur, NIT Srinagar, MNIT Bhopal, MNIT Jaipur and NIT Tiruchirappalli were represented.



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From the Desk of the Executive Director

BMTPC is making all around efforts to mainstream fast-track construction systems, which will help in delivering quality safe houses in quick time. In this process, BMTPC has gone in different states to conduct sensitization cum training programmes on new technologies along with technology providers. It has evinced interest amongst various authorities both public & private and states are gearing up to embrace them with open hands.

It has also increased BMTPC's sphere of activities, as these new systems need to be provided constant technical backup & support in terms of specifications, functional and structural designs, manuals for construction, services, QC & QA etc. However, the link, which at present requires immediate attention, is lack of construction agencies and contractors who are ready to take up mass housing projects. The technology providers are primarily interested in selling their product rather than getting into construction. On way is to create collaboration between technology providers and construction agencies. Some technology providers have succeeded in it, nevertheless most of them are struggling. Therefore, we need to encourage & motivate construction/contracting agencies to adopt new construction systems in order to deliver 20 million houses by 2022 as envisaged under Pradhan Mantri Awas Yojna (PMAY)-Urban.

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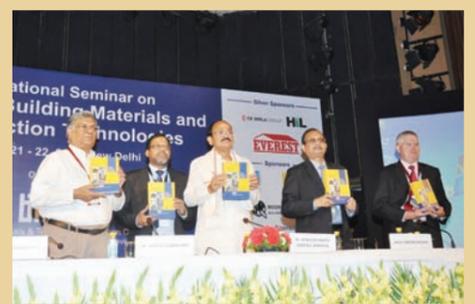
International Seminar on "Emerging Building Materials and Construction Technologies"



BMTPC organized the International Seminar on Emerging Building Materials & Construction Technologies on March 21-22, 2016 at new Delhi so as to bring all stakeholders on one platform to share their knowledge and experience.

The International Seminar was inaugurated by Shri M. Venkaiah Naidu, Hon'ble Minister of Housing & Urban Poverty Alleviation, Urban Development and Parliamentary Affairs, Government of India. Besides Academic, R&D Institutions, known experts of the country; agencies involved in bringing technologies from advanced countries also participated with their technical presentation and showcasing of products and system. The participants also include representatives of Govt. agencies, faculty & students of technical institutions. More than 380 delegates participated in the Seminar. On this occasion a publication titled "Emerging Building Materials & Construction Technologies" and Audio-Visual CD "Hands on Training for Masons" were released.

To coincide with the International Seminar, an Exhibition on Emerging Building Materials and Construction Technologies showcasing various building products and construction technologies was also organised. More than 20 firms/companies displayed their products, technologies and systems.



Alternate Building Materials & Technologies

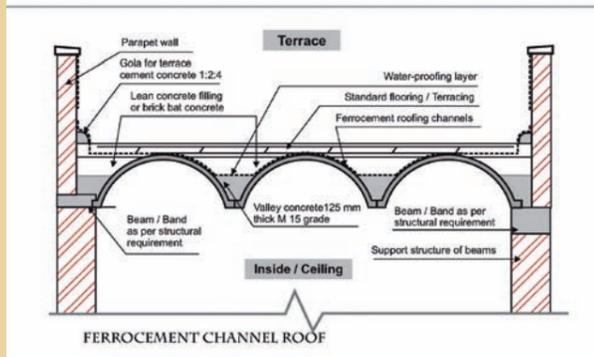
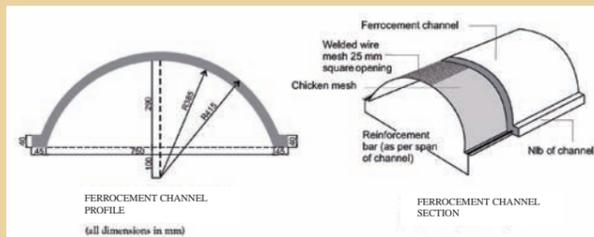
Ferro-Cement Roofing Channel: An alternate for roofing

Ferrocement Roofing Channels are pre-cast shell units made with rich cement mortar (1:2 to 1:3) and reinforcement consisting of a continuous layer of chicken mesh with steel bars provided at two ends of the channel. These shell units are cast either manually on a masonry mould or mechanically on steel moulds mounted on table vibrator. The channels are supported on ends either on load bearing masonry or on a frame structure (RCC or steel).

Ferrocement comprises of a uniform distribution of reinforcement by use of chicken wire mesh and welded mesh encapsulated in rich cement mortar, thereby achieving significant reduction in both steel reinforcement and dead weight of roof. This composition provides a more uniform distribution of strength as compared to RCC.

In order to balance the channel movement at ends, restraining beams must be provided to prevent differential movement of Ferrocement Channel roof in case of any instability in the support structure. The restraining beam will be a part of RCC bands required for structural strengthening, specially in disaster prone areas.

After the Channels have been placed side by side, they are joined together with a concrete infill of at least M15 grade (1:2:4) laid to 150 mm thickness. This concrete completes the T-beam structural action of the Ferrocement Channels and creates a basic roof. In case of an intermediate floor, the remaining portion of the valley can be filled with lean concrete, brick jelly lime concrete or light-weight material and finished with a floor.



Emerging Technologies for Building Construction

Precast Large Concrete Panel System

Precast construction system is generally a large panel system, modular system or a combination of both. Precast Large Construction Panel (PLCP) system consists of various precast elements such as walls, beams, slabs, columns, staircase, landing and some customized elements that are standardized and designed for stability, durability and structural integrity of the building. Precast residential building construction involves design, strategic yard planning, lifting, handling and transportation of precast elements. This technology is suitable for construction of high rise buildings resisting seismic and wind induced lateral loads along with gravity loads. The building framing is planned in such a way that maximum number of repetitions of moulds is obtained. These elements are cast in a controlled factory condition. The factory is developed at or near the site which provides an economical solution in terms of storage and transportation.

Uses

The system shall be used for mass housing projects and commercial buildings, etc.

Types of precast elements

Two main types of precast concrete elements, namely precast reinforced concrete elements and precast pre-stressed concrete elements are used as per the details given below:

- i. *Precast reinforced concrete elements* – These shall consist of reinforcement bars and/or welded wire meshes within the elements to provide the tensile strength and resistance against cracks such as façade walls, beams, columns, slabs, refuse chutes, staircases and parapet walls
- ii. *Precast pre-stressed concrete elements* - These shall consist of pre-stressing tendons within the elements to provide a predetermined force needed to resist external loadings and cracks such as hollow core slabs, beams and planks.

Materials Requirement

Ordinary Portland Cement, Fine aggregate (M Sand), Coarse Aggregates, Steel reinforcement, Concrete, Brick masonry, Solid Block, Aluminium, Glass, Non shrunk non-metallic grout, Water proofing membrane, Baker Rod and Corrugated sleeve.



Skill Development and Capacity Building

Capacity Building Programme on Good Construction Practices including Emerging Technologies for Housing

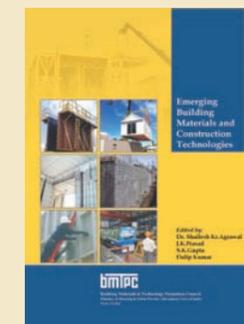
BMTPC organizes capacity building and training programmes on regular basis. The purpose of these programmes is to enhance the capacity of Engineers & Architects at ULB & State level in the area of "Quality Control and Good Construction Practices" in housing projects and to introduce emerging technologies for construction of houses which may be useful for mass housing projects in the States.

In this series, a Capacity Building Programme on Good Construction Practices including Emerging Technologies for Housing was organised at Gangtok, Sikkim from March 1-2, 2016. Around 65 participants from State Government attended the programme.



Recent Publications

Proceedings of International Seminar on Emerging Building Materials & Construction Technologies



The International Seminar on Emerging Building Material & Construction Technologies was organized to take stock of the various developments in manufacturing and use of basic building materials, construction practices and services from March 21-22, 2016 at New Delhi. The papers submitted for the seminar were brought out in form of this publication which includes more than 50 technical papers written by well-known experts and institutions covering different areas of building materials and construction practices.

Demonstration Construction

Status of Construction of Demonstration Housing Project at Nellore, Andhra Pradesh

The Government of Andhra Pradesh has allotted the land for construction of 36 demonstration houses (G + 1) and a demonstration community building at Saraswathi Nagar, Chowtaplem Village, Venkatachalam Mandal, SPS Nellore District admeasuring 1.85 acres.

The demonstration houses are being constructed with Glass Fibre Reinforced Gypsum (GFRG) Panel System and Community building is being constructed using alternate technologies such as filer slab for roofing and flyash blocks for walling.

The construction work of houses has reached upto first floor level for all five blocks using GFRG panels. The work at Community Centre has also reached upto roof level.

