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A Newsletter of BMTPC

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BUILDING MATERIALS & TECHNOLOGY PROMOTION COUNCIL

Ministry of Housing & Urban Poverty Alleviation, Government of India

भाग 2, अंक 1, जनवरी – मार्च 2013, नई दिल्ली Vol.2, Issue 1, January - March 2013, New Delhi

Performance Appraisal Certification Scheme (PACS)

The Ministry of Housing & Urban Poverty Alleviation (erstwhile Ministry of Urban Development & Poverty Alleviation), Government of India under the Gazette Notification No.16011/5/99-H-II in the Gazette of India No.49 dated the 4th December, 1999 has authorized the "Building Materials & Technology Promotion Council" to issue Performance Appraisal Certificates (PACS) giving independent opinion of the fitness of new building materials, components, products, elements, construction system and assemblies for intended use, not yet covered by Indian Standard. This scheme provides for a third party (BMTPC) certification for certifying the performance of the product and in the process, generates sufficient data needed for formulation of Indian Standard at later stage.

BMTPC in its 5th Technical Assessment Committee (TAC) held on 15th March, 2013 has approved renewal of PACs for further period of 2 years for (1) Formwork for monolithic Concrete Construction, (2) Insulated Roof Panels, (3) Plasto Crete Panel, (4) Underground Water Storage Tank (SUMP), (5) PVC Profile Doors, (6) Endura Doors, and (7) Fomura Doors.

Further, BMTPC is in the process to evaluating the items e.g. (i) Innovative Construction System using Light Gauge Steel (LGS)- Foam Concrete Construction Technology, (ii) Aluminum Formwork System, (iii) R-Panel using Expandable Polystyrene & G.I. wire, and (iv) Anhydrite Binder, for possible award of PACS.

Demonstration Housing Project at Rae Bareli, U.P.

The Council initiated construction of Demonstration Houses at Barwaripur, Rae Bareli, Uttar Pradesh, which consists of 24 dwelling units (G+1) having each unit with plinth area of 32 sqm consisting of one living room, one bedroom, kitchen, one separate bath and WC. The project would be the live example of field level application of cost effective building materials and disaster resistant technologies in the region. The work has reached upto sill level and evinced interest amongst local people regarding technologies being used in the project.

For further details, please contact:

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From the Desk of the Executive Director

I am indeed delighted to note that our newsletter has entered into 2nd year. It gives us chance to communicate with you all and apprise about various initiatives of ours towards creating enabling environment for affordable housing. In our quest towards alternate construction systems and materials, it is been realized now that all stake holders in the construction industry are seriously contemplating an idea of getting away with conventional in-situ systems of construction & encouraging pre-fabrication in some form or other. This pre-fabrication not only brings in speed but also helps in delivering the product which is of better quality, durability and above all cost-effective. As regards materials, use of pozzolana cement (cement with flyash), blocks and bricks from waste & lighter materials reducing use of top soil, doors and windows from plantation timbers and other composites is gaining importance. Also, the basic materials such as sand & aggregates are scarce and already most the states are grappling with the problem. The manufactured sand & light weight aggregates to replace natural sand and aggregates are the new entrants in the construction industry.

A clarion call from our side would be to use alternative materials based on renewable resources rather than natural resources before it becomes too late.

(Dr. Shailesh Kr. Agrawal)

Published by:

Building Materials & Technology Promotion Council, New Delhi

Launching of Training of Trainers Programme on Earthquake Resistant Design & Construction

BMTPC in association with Bihar Institute of Public Administration and Rural Development (BIPARD), Government of Bihar kick-started the series of Training of Trainers (TOTs) Programme by organisation of Sensitization Programme on "Earthquake Resistant Design and Construction" jointly with IIT Roorkee on 15th January, 2013 at Patna. The Sensitization Programme was inaugurated by Hon'ble Minister of Disaster Management, Ms. Renu Kushwaha. On this occasion, the Hon'ble Minister released the Council's publications namely 'Earthquake Tips' (in Hindi) and Resource Material in form of a book entitled "Design & Construction of Earthquake Resistant Structures : A Practical Treatise for Engineers & Architects". Around 110 participants from various departments of the State Government of Bihar ranging from Executive Engineers to Chief Engineers and other senior level officers and decision makers participated in the Sensitization Programme. The first batch of Training of Trainers (TOT) programme was organised from 16 – 19 January, 2013. The resource persons were from IIT Roorkee, IIT Mumbai, NIT Patna, BMTPC including other experts in the field. At the end of the programme, evaluation of trainees were conducted through examination.

Rejuvenation and Strengthening of the National Network of Building Centres – Pilot Studies

In order to revive erstwhile Building Centres Scheme, a concerted effort has been made by the Ministry of Housing & Urban Poverty Alleviation and a Committee was set up by HUDCO in consultation with Ministry to look into problems, prospects and proposal for revival. The Committee has given their recommendations to undertake initially few Pilot Studies. The pilot studies would be the possible approaches and ways towards revitalisation of the Building Centres and it may lead to undertake a major programme under the aegis of the Government of India for taking Building Centre concept forward with renewed and fresh thinking. The Committee recommended 28 projects with 25 Building Centres. BMTPC has been assigned the project for awarding Pilot Studies under HUDCO CSR funding. The Council has already supported project proposals received from the identified Building Centres.

Alternate Building Materials & Technologies

Cellular Light Weight Concrete Blocks

General

The cellular concrete is concrete which contains stable air or gas cells uniformly distributed in the mix. It is a product consisting of Portland cement, silica, pozzolana or pastes containing blends of these ingredients and having homogeneous void or cell structure, attained with preformed stable foam.

The blocks for masonry units of various dimensions can be produced which are relatively large and true in size and shape from Cellular Light Weight Concrete (CLC). Being a lighter material using industrial waste better thermal performance, it is being preferred for multi-storeyed building now.

Materials: Cement, sand, fly ash and water, conforming to requirements of relevant standards, foaming agent and suitable additive and admixture. The foaming agent should meet the requirements of Clause 9 of IS 9103.

Specifications: IS 2185 (Part 4) 2008: Specifications for concrete masonry units (Part 4): Preformed foam cellular concrete block.

Dimensions and Tolerances: The CLC blocks shall be made in sizes and shapes to fit different construction needs.

The normal sizes of CLC block shall be as follows:

- Length : 400, 500 or 600 mm
- Breadth : 100, 150, 200 or 250 mm
- Height : 250 or 300 mm

In addition, block shall be manufactured in half lengths of 200, 250 or 300 mm to correspond to the full length.

Tolerances on each unit shall be	length ±5 mm, height and breadth 3 mm
Water absorption	7.5% to 12.5%
Compressive strength	2.5 to 25.0 N/mm^2
Thermal conductivity	0.32 to 0.54 kcal/m/h/°C

Emerging Technologies for Building Construction

Monolithic Concrete Construction System

Monolithic Concrete Construction is one of the emerging technologies being adopted by many government and Pvt. agencies in the country. The system, successfully used in many countries like Malaysia, Vietnam, Singapore etc., involves specifically designed modular formwork made of aluminium, plastic or composite materials. In this system, instead of traditional column and beam construction; walls and slabs are cast in one operation at site. Rapid construction of multiple units of repetitive type can be achieved with a sort of assembly like production by deployment of only a few semi-skilled artisans.

The entire operation essentially comprises fitting and erecting the portion of shuttering as already determined (the optimization use as determined by appropriate planning) placement of reinforcement and then carrying out concerting of the walls and slab, Props are so designed that they stay in position while deshuttering of slabs. The cycle of construction is 3 - 5 days per floor before using the final product

The economy is achieved based on type of formwork and number of repetition of their use.

Material Requirements

- Steel reinforcement and concrete as pr IS 456:2000. Code & Practice for plain and Reinforced concrete.
- Specifically designed modular formwork of adequate strength & quality

Structural Consideration

As per guidelines prepared by BMTPC, monolithic concrete construction may be considered as shear wall type construction and should be designed for vertical loading, in plane shear loading and out of plane loading due to wind and earthquake forces.

General Requirements

- In view of thin structural element, proper building planning for adequate air ventilation is essential.
- Foundation is based on geotechnical data.
- Recommended minimum of wall thickness below ground: 200 mm with double layer reinforcement.
- The detailing at the joint wall panels and between wall and floor / roof shall ensure continuity.
- The detailing requirements as per IS 456:2000 and IS 13920: 1993 for structures subjected to seismic forces, as applicable, shall be complied.

Skill Development and Capacity Building

Capacity Building Programmes organised during the quarter (January to March 2013):

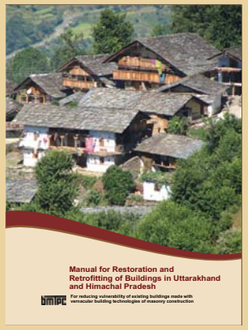
- Training programme for Masons on Cost Effective Construction Technologies in Rural Areas at Amirgarh, Gujarat during March 7-9, 2013. Thirty participants participated in the training programme.
- Training Programme and Exhibition for Supervisors on Low Cost Building Materials & Construction Techniques during March 13-14, 2013 at Building Centre, SATI, Vidisha, MP. Twenty participants participated in the training programme.
- Training programme for Supervisors on Low Cost Building Materials & Construction Techniques during March 18-19, 2013 at IIHRD, Vidisha, Madhya Pradesh. Twenty participants participated in the training programme.
- Training Programme for Supervisor on Effective Supervision of Workers and Improve the Construction Supervisor's Ability during March 20-21, 2013 at RADS Tehri Garhwal, Uttarakhand. Twenty five participants participated in the training programme.
- Training Programme of Masons for Rural Areas on the Manufacturing Process for the Fly Ash based Building Products during March 23-24, 2013 at Adityapur, Jamshedpur. Thirty participants participated in the two days training programme.
- Two days Hands on Mason's Training Programme on 'Quality and Disaster Resistant Construction Practices' from March 23-24, 2013 at Building Centre, Kerala GIDC, Bavla, Gujarat. Twenty participants attended the training programme.
- Training Programme for Engineers and Supervisors on Green Building Technologies from March 28-29, 2013 at Rural Building Center Kanyakumari, Tamilnadu. Twenty five participants attended the training programme.

Recent Publications

STRUCTURAL DESIGN MANUAL FOR GFRG PANEL SYSTEM

The Glass Fibre Reinforced Gypsum (GFRG) Panel System, commonly known as Rapidwall, is an alternate technology for construction of buildings. The technology is evaluated by BMTPC under the Performance Appraisal Certified Scheme (PACS). The Manuals deals with the engineering design aspects of GFRG Panels and provides guidelines to design building using GFRG Panels.

MANUAL FOR RESTORATION AND RETROFITTING OF BUILDINGS IN UTTARAKHAND AND HIMACHAL PRADESH



This manual is prepared for the restoration and vulnerability reduction through retrofitting of the existing buildings in Uttarakhand and Himachal Pradesh situated in the Western Himalayan belt of India. It covers the most prevalent building systems other than the reinforced concrete frame, being used by the people of the region.

DESIGN PACKAGE USING ALTERNATE BUILDING MATERIALS & TECHNOLOGIES : SOUTH ZONE

BMTPC developed the Design Package on Alternate Building Materials & Technologies for various regions of the country having different geo-climatic condition and topography and are customized to the local needs and includes regional specific appropriate technologies to help in mainstreaming the time proven technologies. The Design Package for South Zone envisages to facilitate wide spread dissemination and adoption of proven cost effective and sustainable building materials and construction technologies as an alternate to the conventional.